

# TSK High-Pressure Hot Air generator KD Series

## Instruction Manual: Basic Operation Guide

### ● Be sure to read before use.

- ◆ Thank you very much for purchasing the TSK High-Pressure Hot Air Generator.
- ◆ Verify that the model number, part number, and voltage on the unit's nameplate match the ordered product.
- ◆ This manual describes the basic operation of the hot air generator. For installation, piping, power supply, service terminals, fault detection, and convenient features, please refer to the main manual.



1. Normal Operation
2. Timer Operation/Timer Stop
3. When Using an External Sensor
4. When Using External Operation
5. Setting Temperature Alarms
6. When Using External Temperature Control
7. When Using the Cooling Operation Function
8. Operation Stop

### TSK High-Pressure Hot Air Generator

- KD-56H2
- KD-83H2
- KD-82H5

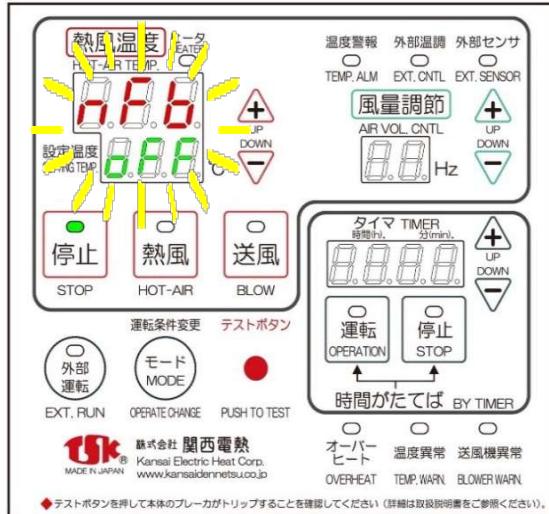


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Furthermore, the illustrations and displays in this manual do not guarantee the actual appearance of the product.  
do not guarantee the actual appearance.  
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# 1. Normal Operation

## ① Turn ON the factory power supply (primary power source).

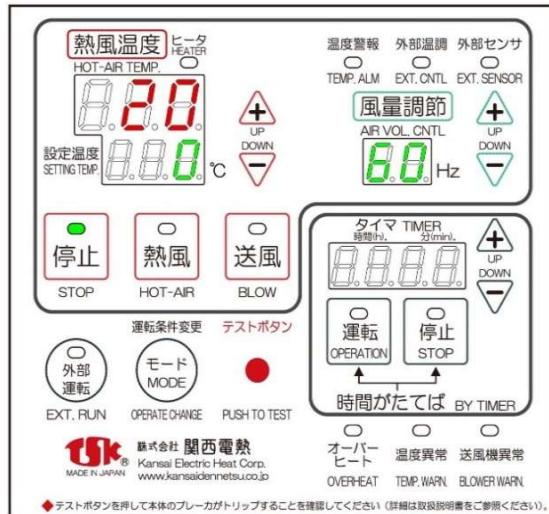
The stop lamp (green) will light up, and 'nFb' will flash in the hot air temperature section while 'oFF' flashes in the set temperature section.



※ No operation is possible in this state.

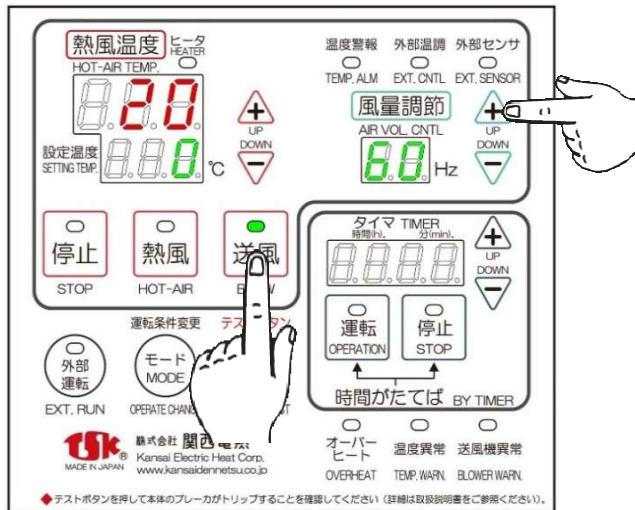
## ② Turn ON the main breaker (NFB).

The hot air temperature display will show the current temperature, the set temperature display will show '0', and the air volume adjustment display will show '60' (frequency).



※ On subsequent starts, the set temperature display and airflow control display will show the previous settings.

## ③ Pressing the fan switch will light the fan lamp (green) and start fan operation.

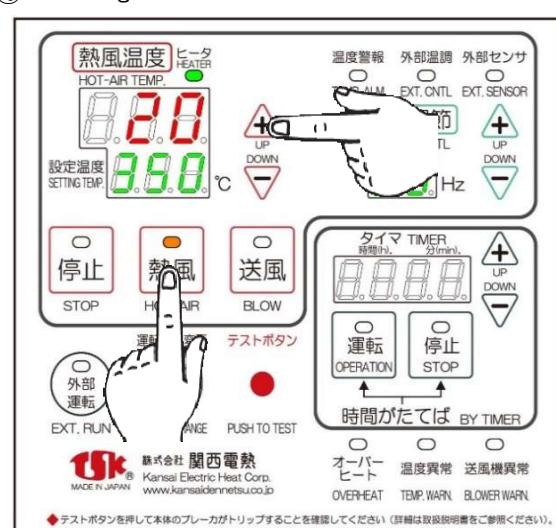


### Fan Speed Setting (Frequency Setting)

The frequency can be adjusted from 20 to 60 Hz in 1 Hz increments using the

※ Even if the airflow is set to the minimum airflow adjustment setting value of 20Hz, the hot air generator will not heat up to the maximum temperature if it is in a near-no-load state (because the lower limit of the motor speed is set considering the cooling effect of the blower motor). In this case, install a damper, etc., at the inlet and restrict the airflow using the damper, etc., at the minimum airflow setting.

## ④ Pressing the hot air switch will illuminate the hot air lamp (orange) and start hot air operation.



### Hot Air Temperature Setting

Use the up/down keys to change the setting from 0 to 350° C in 1° C increments.

### 『Caution』

Hot air temperature is measured and managed at the outlet temperature sensor near the heater. However, temperature differences may occur at the outlet due to physical air turbulence caused by changes in airflow volume and pressure losses on the discharge and intake sides.

Therefore, to measure more accurate temperatures, we recommend using an external sensor and operating the hot air generator based on temperatures inside the furnace or similar locations.

The heater lamp (green) indicates the heater's ON/OFF status by lighting or flashing.

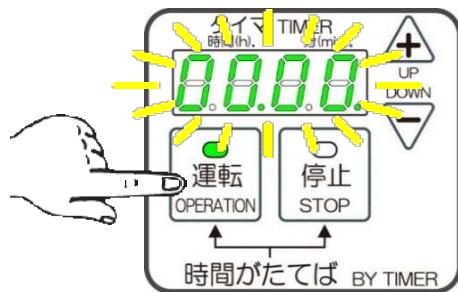
## 2. Timer Operation/Timer Stop

Before starting or stopping timer operation, set the hot air temperature and airflow volume as desired. Perform timer settings while the unit is stopped(timer settings cannot be made during fan operation or hot air operation).

### ● Timer Operation (Operation after time elapses)

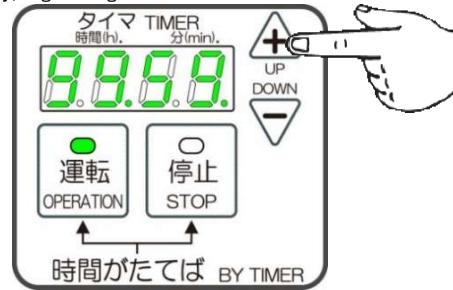
#### ① Press the timer operation switch.

The timer operation lamp (green) will light up, and the timer display will show '00.00.' flashing, or the previously set time will be lit.

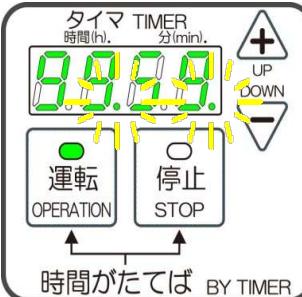
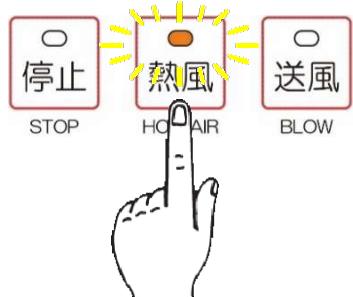


#### ② Use the up/down keys to set the desired time.

You can set up to a maximum of 99 hours and 59 minutes in 1-minute increments. After setting, release the Up/Down keys. After 2 seconds, the display will change from flashing to steady, registering the set value.



#### ③ Press the Hot Air Operation Switch.



The time countdown (timer countdown) will start (dot display flashes). When the time countdown reaches '00.00', hot air operation will begin. During the time countdown, the hot air lamp (orange) will flash. After hot air operation starts, it will switch to a steady light.

※ After the time count ends, the timer display will show '00.00.'

※ Pressing the stop switch halts both timer operation and the time countdown.

### ● Timer Stop (Stops After Time Elapses)

#### ① Press the timer stop switch.

The timer stop lamp (green) will light up, and the timer display will show '00.00.' flashing or the previously set time lit.

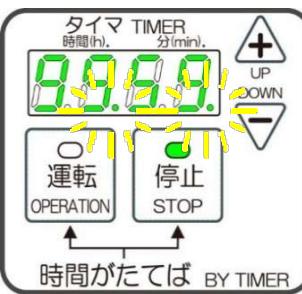
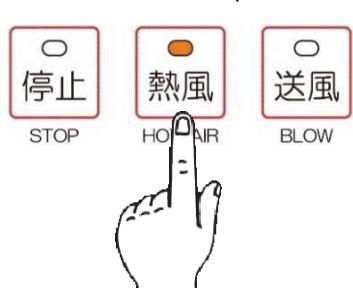


#### ② Use the up/down keys to set the desired time.

You can set up to a maximum of 99 hours and 59 minutes in 1-minute increments. After setting, release the Up/Down keys. After 2 seconds, the display will change from flashing to steady, registering the set value.



#### ③ Press the Hot Air Operation Switch.



Time counting (timer set time subtraction) begins (dot display flashes), and hot air operation starts. When time counting reaches '00.00', hot air operation stops. Also, during hot air operation, the hot air lamp (orange) lights up, and after hot air operation ends, it switches to flashing.

※ After the time count ends, the timer display will show '00.00.'

※ Pressing the stop switch halts both timer operation and the time countdown.

### 3. When Using an External Sensor

- You can control the temperature of a remote location using an external sensor. After connecting the external sensor to the external sensor input terminal block on the service terminal, perform the settings.
- When using an external sensor, the set temperature value for hot air temperature setting corresponds to the external temperature sensor position setting, and the hot air temperature value for hot air temperature indication corresponds to the temperature at the external sensor position.

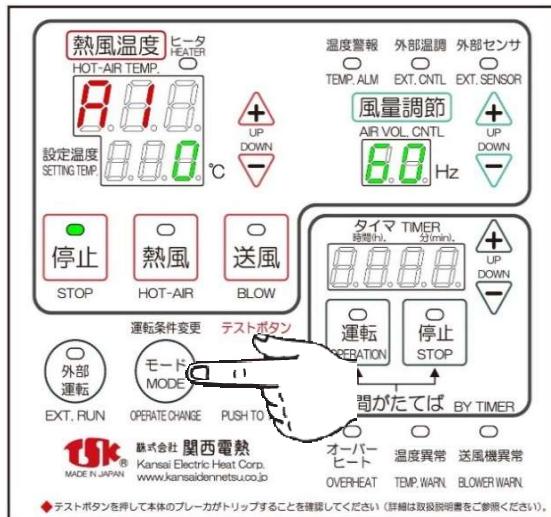
① Connect the external sensor to the external sensor input terminals on the service terminal, ensuring the positive and negative terminals are connected correctly.

•KD-56H2: External Sensor Input Terminal  
ESt - ESt-

•KD-83H2•82H5: External Sensor Terminal  
A6 (+) - A7 (-)

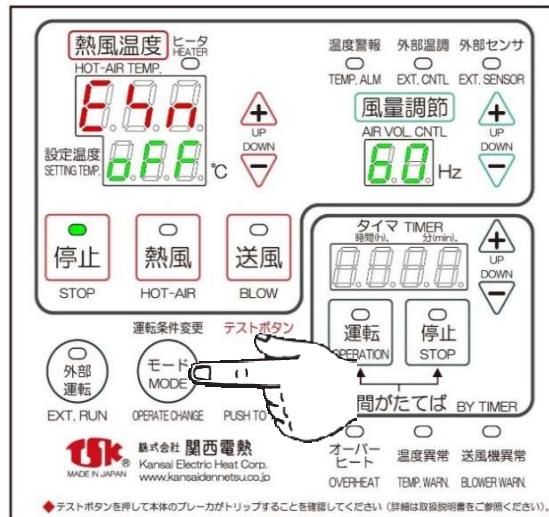
② Press and hold the mode switch for approximately 2 seconds.

'A1' will appear in the hot air temperature section, and '0' will appear in the set temperature section.



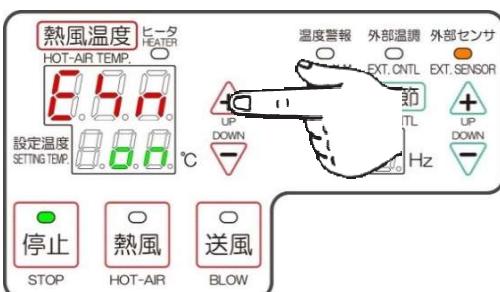
③ Press the mode switch twice again.

The hot air temperature display will show 'ESn', and the set temperature display will show 'oFF'.



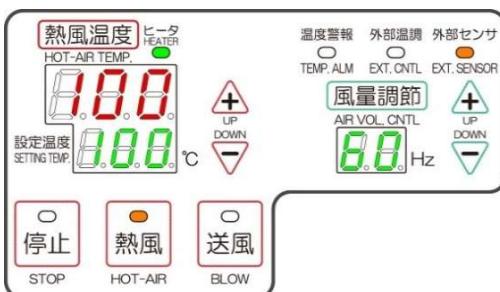
④ Use the up key to set the temperature display to 'on'.

After setting, press the mode switch once to return to the normal operation display.



⑤ After setting the desired temperature and fan speed, start the hot air operation.

When the external sensor setting is turned ON, the external sensor lamp (orange) will illuminate.



- ※ If the external sensor setting is activated without an external sensor connected, the burnout protection will activate, preventing operation (see page 14 of the General Manual).
- ※ If you no longer use the external sensor, return the temperature setting to 'oFF' as described in step ④ above.

## 《Caution》

Hot air temperature is measured and managed at the outlet temperature sensor near the heater. However, physical air turbulence caused by changes in airflow volume and pressure losses on the discharge and intake sides may result in temperature differences at the discharge surface.

To resolve these issues, we recommend operating the hot air generator based on temperatures inside the furnace, etc., using an external sensor.

## 4. When Using External Operation

※ After the hot air generator stops due to external operation, the unit cannot be restarted for approximately 5 seconds.

● External signals can be used to operate the hot air generator (start/stop) and control the heater (on/off).

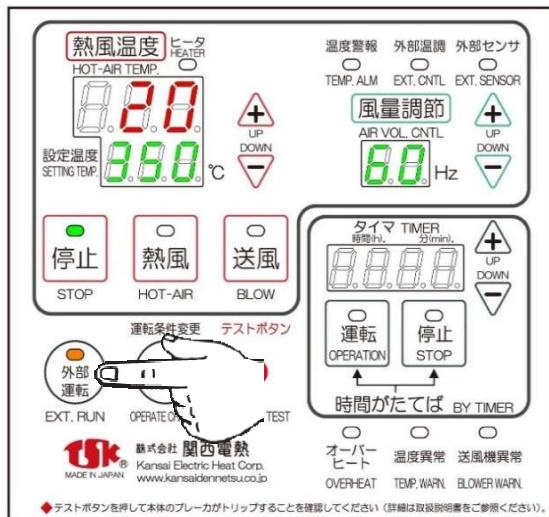
① Connect the external signal (voltage-free contact signal) to the external operation ON/OFF terminal and external heater ON/OFF terminal on the service terminal.

External Operation On/Off Terminal  
E.R -  
External Heater On/Off Terminal E.H -  
Terminal Voltage: DC 12V, 3.6mA or less

•KD-83H2・82H5: External Operation On/Off A1 - A3  
External Heater On/Off A2 -  
Terminal Voltage: DC 24V, 7mA or less

② Please continue to push EXT. RUIN switch in stoppage condition after setting optional temp. and air volume (About 2 seconds).

The external operation lamp (orange) will illuminate.



※ During external operation mode, the fan switch and hot air switch are disabled (cannot be operated).

※ Press the stop switch to reset external operation. Timer operation and timer stop are not possible during external operation.

※ External operation mode is canceled by turning the unit's NFB OFF. Turning OFF the factory power supply (primary power supply) does not cancel it.

③ Operate using the external operation signal.

BLOW lamp (Green) is lighted at the time of blow operation by the external run ON/OFF signal is ON, external heater ON/OFF signal is OFF.



When operating in hot air mode with the external operation ON/OFF signal ON and the external heater ON/OFF signal ON, the hot air lamp (orange) will illuminate.



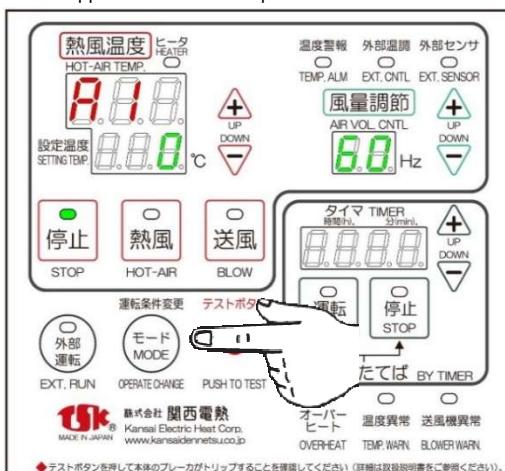
※ After stopping the hot air generator via external operation, it cannot be restarted for approximately 20 seconds (the restart standby state is indicated by the blower or hot air lamp flashing; it starts 5 seconds after stopping). Furthermore, frequent ON/OFF cycling of the external heater will shorten the internal relay's lifespan. If high-frequency heater ON/OFF cycling is required, use the external temperature control function.

## 5. Setting Temperature Alarms

\*The temperature alarm mode can be changed as desired refer to the "Convenient Functions" instruction manual.

● If the discharged hot air temperature exceeds a specified constant range relative to the set temperature, an alarm signal can be output. Use as needed (disabled by default at shipment).

① Press and hold the mode switch for approximately 2 seconds. 'A1' will appear in the hot air temperature section, and '0' will appear in the set temperature section.



※ The unit will not stop operation due to a temperature alarm.

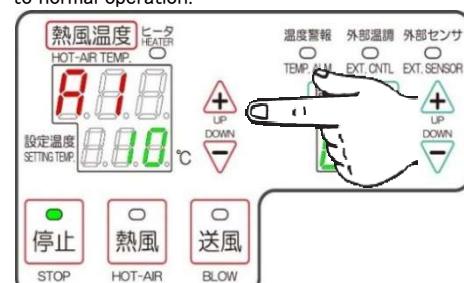
※ Setting the temperature alarm to 0 disables the

※ The temperature alarm is output as a voltage-free contact signal (contact capacity: DC5V 10mA or more, DC30V 1A or less) from the temperature alarm output terminal.

•KD-56H2: Temperature alarm output.

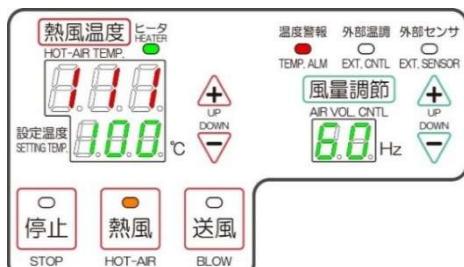
•KD-83H2・82H5: Temperature Alarm

② Use the up/down keys to set the desired temperature range. After setting, press the mode switch three times to return to normal operation.



③ Start hot air operation.

For a '10' setting, the alarm lamp (red) will illuminate and an alarm will be output from the service terminal when the temperature exceeds +10° C or falls below -10° C from the set discharge temperature (excluding the initial temperature rise when hot air operation starts).



## 6. When Using External Temperature Control

- The hot air generator can be controlled by signals from an externally installed temperature controller. In this case, use the unit's temperature controller as an outlet temperature upper limit limiter.
- When using the external temperature control function, the hot air temperature setting for the set temperature value and the hot air temperature display for the hot air temperature value will be the temperature measured by the outlet sensor.

① Prepare a temperature sensor to measure the external temperature and a temperature controller to manage the external temperature. Connect the output from the external temperature controller to the external temperature control input terminals, ensuring the positive and negative connections are correct.

•KD-56H2

External Temperature Control Input Terminal E.C+ - E.  
SSR Drive Reverse Operation Output (DC 12V to 24V)

•KD-83H2・82H5:

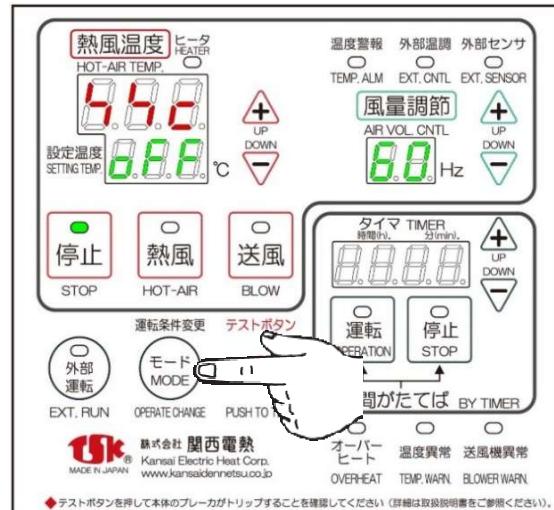
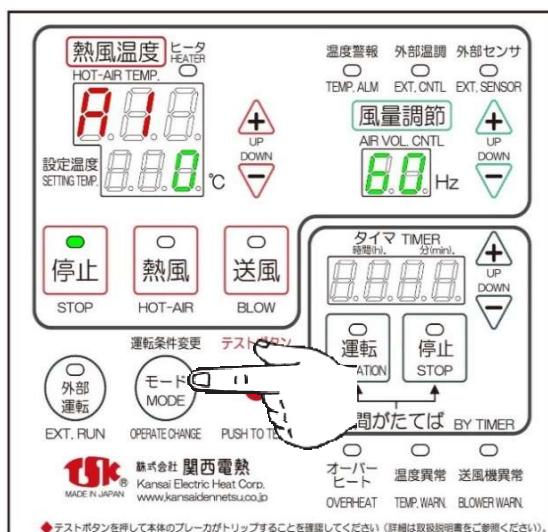
External Temperature Control Terminal A4 (+) - A5 (-)  
SSR Drive Reverse Operation Output (DC 12V to 24V)

② Press and hold the mode switch for approximately 2 seconds.

'A1' will appear in the hot air temperature section, and '0' will appear in the set temperature section.

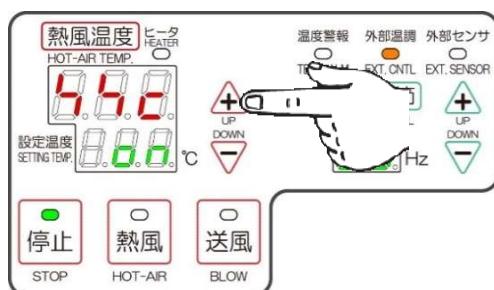
③ Press the mode switch once again.

The hot air temperature display will show 'SSc', and the set temperature display will show 'oFF'.



④ Use the up key to set the temperature display to 'on'.

After setting, press the mode switch twice to return to the normal operation display.



⑤ After setting the desired temperature and airflow, start hot air operation and simultaneously begin temperature management using the external thermostat.

When external temperature control is turned ON, the external temperature control lamp (orange) will illuminate regardless of the external temperature control input.



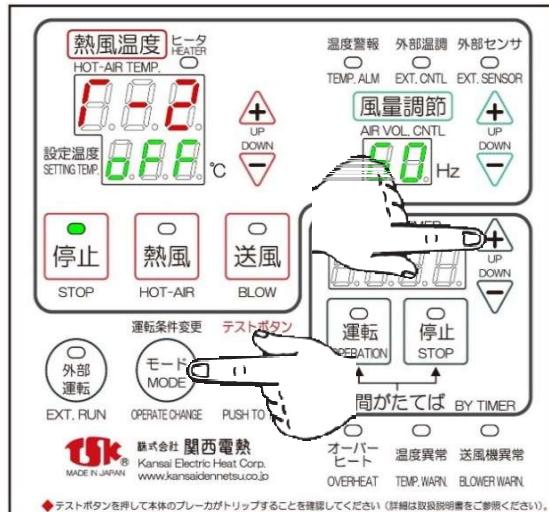
- When using the external temperature control function, control is based on whichever temperature is reached first: the temperature set on the external temperature controller or the outlet temperature set on the hot air generator unit itself. Therefore, set each temperature considering heat dissipation from piping, etc.
- When no longer using the external temperature control function, return the set temperature section to 'oFF' as described in step ④ above.

## 7. When Using the Cooling Operation Function

- The cooling operation function is only available when selecting timer-based operation stop. After timer-based hot air operation, it performs fan operation for a specified duration before stopping.
- ※ Our hot air generators have a low heater wattage density setting, so cooling operation to prevent heater breakage is unnecessary. Therefore, use this cooling operation function to prevent burns from residual heat in piping, etc., after operation stops, or to cool down dried/heated products after processing.

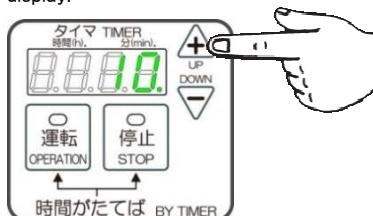
① While in the stopped state, press and hold the mode switch while continuously pressing the timer's up key.

The hot air temperature display will show 'T-2' and the set temperature display will show '0FF'.



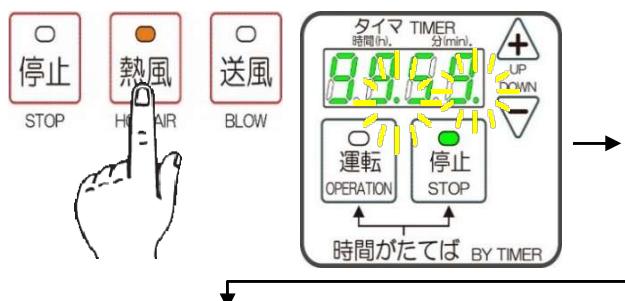
③ Use the up/down keys to set the desired cooling time.

After setting, press the mode switch once to return to the normal operation display.

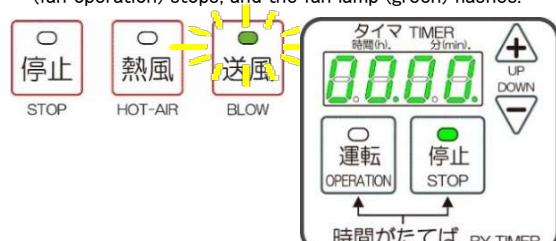


⑤ Press the Hot Air Operation Switch.

The time countdown (dot display flashing) will start, and hot air operation will begin. Additionally, the hot air lamp (orange) will illuminate during hot air operation.

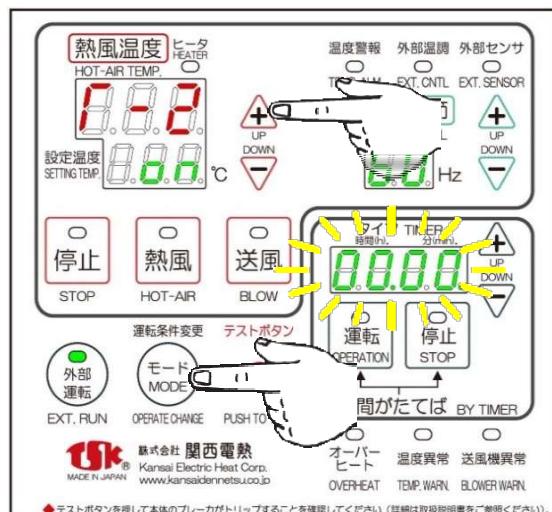


When the time count reaches '00.00', the cooling operation (fan operation) stops, and the fan lamp (green) flashes.



② Use the up key to set the temperature display to 'on', then press the mode switch once.

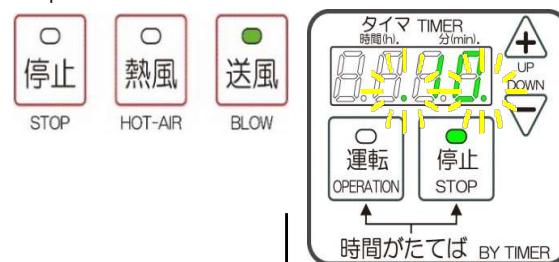
The timer display will flash '00.00'.



④ Press the timer stop switch to set the hot air operation time.



After the hot air operation ends via timer operation, the timer-controlled cooling operation (fan operation) will begin. The fan lamp (green) will also illuminate during cooling operation.



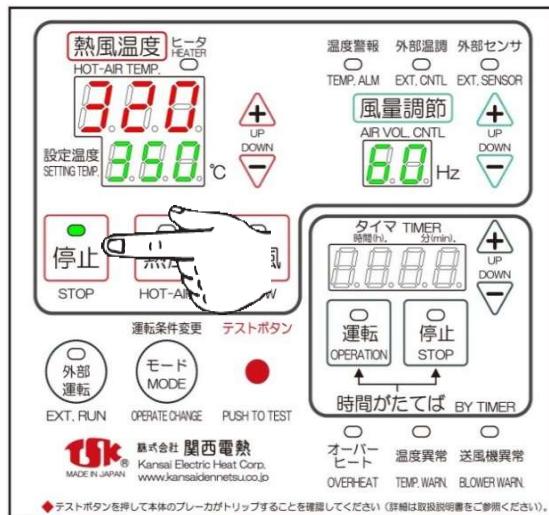
※ Pressing the stop switch will halt timer operation (the timer setting will return to its default value).

## 8. Operation Stop

- To stop the hot air generator during normal operation, press the stop switch.
- Also, if the hot air generator will not be used for an extended period, turn OFF the factory power supply as well.

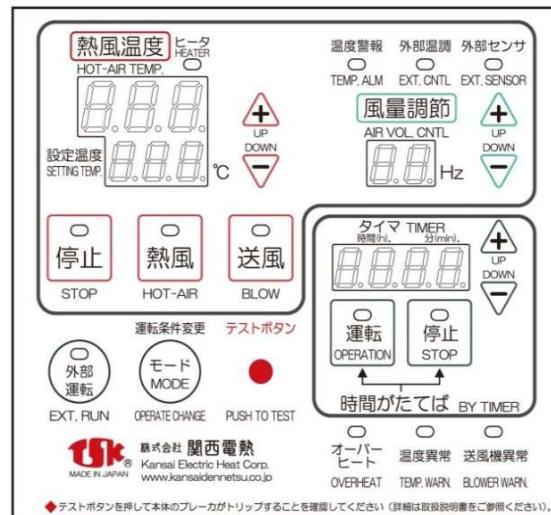
- Press the stop switch.

The stop lamp (green) will light up, and all operations will stop.



- If the hot air generator will not be used for an extended period, also turn OFF the factory power supply.

All displays will turn off.



\* There is no need to turn off the main unit's circuit breaker (NFB).

- Always stop the unit using the stop switch before turning off the factory power supply or the main unit breaker. Turning off the factory power supply or the main unit breaker without first stopping the unit using the stop switch during operation may cause malfunction.
- When operating or stopping the hot air generator via external control, turning the main breaker OFF and then ON again will cancel the external control mode. If power is interrupted while using external control mode, always shut off the power at the factory-side power supply (primary side power supply). (Reapplying power at the factory-side supply will retain the external control mode.)

**Do not stop the hot air generator using an electromagnetic contactor or similar device installed on the primary side of the hot air generator. Surge voltage may damage internal electronic components.**

**Keep the hot air generator's circuit breaker (NFB) ON at all times. Do not use it as an ON/OFF control switch. Surge voltages may damage internal electronic components.**

- Operation during power outages and momentary power interruptions
  - For all models, if the factory power supply is momentarily interrupted due to a power outage, etc., and the power is restored (re-energized) within 1 second, the unit will automatically resume operation from the state prior to the interruption.
  - If the power interruption lasts 1 second or longer, the hot air generator may stop and a blower abnormality (INV ALM display) may occur when power is restored. In this case, turn the unit's breaker OFF, then ON again before restarting operation (this will cancel external operation mode if it was active).

**Inquiry regarding the hot-air generator ....**

*Homepage*

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