This instruction manual must be delivered to the end user. For your records

Date Created: January 2023

# Type B Series
# Dedicated Automatic Temperature Controller

# Instruction Manual

● Be sure to read before use.

- Thank you very much for purchasing the TSK Hot Air Generator.
- Verify that the model number, part number, and voltage on the nameplate match the ordered product


1. Installation
2. Power Supply
3. Wiring
4. Terminal Structure and Terminal Arrangement
5. Maintenance and Inspection
6. Names and Functions of Components
7. Service Terminal
8. Normal Operation
9. Timer Operation/Timer Stop
10. External Sensor
11. External Operation
12. Temperature Alarm
13. External Temperature Control
14. Cooling Operation Function
15. Fault Detection
16. Wiring Diagram
17. Controller Remote
18. Warranty


- TRT20A
- TRT51A
- TRT101A




Kansai Electric Heat Corp.

# 1. Installation

①unit is for installation only. Install it in a level position.

※The space beneath the main unit is necessary for internal cooling.
Do not remove the mounting brackets for installation.

②Securefirmly as needed.

③where installation is not possible

・Locations subject to vibration ・Above heat-generating objects ・Sealed rooms and enclosures ・Near combustible materials
・low atmospheric pressure ・Ambient humidity of 85% R.H. or higher ・Outdoors where exposed to wind and rain
・At elevations of 1000 meters or higher ・high levels of dust or particulate matter ・Back side is in direct contact with walls, etc.
・Outside the ambient temperature range of −5° C to +40° C ・Locations where acidic gases, corrosive gases, etc., are present
・Locations with electrically conductive suspended particles (e.g., carbon fibers)

*TRT20A generates up to 50W, TRT51A up to 130W, and TRT101A up to 200W of heat.

# 2. Power Supply

Power connection and grounding work must be performed by a licensed electrician.

② Always use commercial power with a pure sine wave (50/60 Hz) for the hot air generator's power supply or distorted waveform. Also, take sufficient measures to prevent surge voltages and noise from entering the power supply.Take thorough countermeasures.

③Provide a dedicated circuit. When installing a ground fault circuit interrupter (GFCI), determine the sensitivity current rating according to the table belowDetermine.

④Perform grounding work to electric shock accidents. (Ground the equipment according to the standards for your operating area.)

⑤For power connection, use the five cable entry holes located on the front, both sides, and bottom of the TRT series.

Caution Excessively long wiring may cause voltage drop.

Caution Always disconnect the power supply during wiring and inspection. Even when the main breaker (NFB) is OFF, the automatic temperature controller's control circuit remains energized. Therefore, always disconnect the factory main power supply (primary side power supply). Working with the power on may cause electric shock.

Caution When using a wall outlet for connection, ensure it has sufficient capacity. Wall outlets may overheat or malfunction due to aging-related poor contact or phase loss, Therefore, avoid using outlets whenever possible.

Caution Hot air generators are primarily designed for industrial environments. Using them in residential settings may cause radio interference. In such cases, the user of this product may be required to take appropriate measures to reduce interference.

| Model | th Leakage Circuit Breaker (ELB) Sensitivity Current Guide |
|---|---|
| TRT20A | 30mA |
| TRT51A | 50mA |
| TRT101A | 100 mA |

※The sensitivity current of a residual current device (RCD) is typically about 10 times the initial leakage current

# 3. Wiring

①Have wiringby a licensed electrician.

② Please reconfirm the control capacity of theTRT series and the hot air generator capacity.

③Since terminal structures and arrangements vary by model for the TRT series, please confirm your purchased model andwiring is performed correctly according to this manual, the hot air generator manual, and the wiring diagram.

④ Use the five cable entry holes located on the front, both sides, bottom, and back of the TRT series for wiring.sidebottom.

Caution TRT51A and 101A must connect safety circuit power terminals 11 and 12. Failure to do so may cause heater breakage and, in some cases, fire.

Caution Use shielded compensation wires for the outlet temperature sensor wiring on terminals 1 and 2.

Caution Keep wiring as short as possible. Do not route it in the same conduit as power lines, motor lines, harmonic lines, etc., nor run it parallel or bundle it with such lines. Exposure to noise can cause malfunctions.

Caution Always disconnect the power supply during wiring and inspection. Even when the main breaker (NFB) is OFF, the automatic temperature controller's control circuit remains energized.
Therefore, always disconnect the factory main power supply (primary side power supply). Working with the power on may cause electric shock.

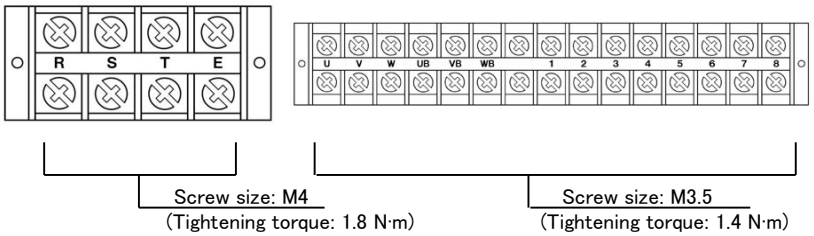
Caution Heater breakage will occur if hot air operation is performed without securing the safety circuit.

# 4. Terminal Structure and Terminal Arrangement

## TRT20A　　Compatible Hot Air Generator: TSK-17B

Heater Control Capacity / Maximum Load Current (at 200V)　Three 5 kW or less ・ 20A

Compatible Blower (Maximum controllable motor current value for Three 80W　(2A or less)




● To prevent malfunctions due to noise, etc., the terminals for the outlet sensor, overheat, abnormal temperature, and blower fan malfunction must be wired separately from power lines, motor lines, and harmonic lines(shielding is recommended).

| R | S | T | E | | U | V | W | U | V | WB | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

Power Input Termi

Supply factory power (primary side power).

Ground Terminal: Wire the ground wire.

Heater Output Terminals

Connect to the heater power supply terminals U, V, W of the hot air generator.

Determine the wire size considering voltage drop.Applicable wire2 mm²)

Blower Output Terminals

Connect to the blower power supply terminals UB, VB, and WB of the hot air generator.

Determine wire size considering voltage drop.

(Applicable wire: 1.25-2 mm²)

※If you provide your own blower, connect the blower's power cable. However, only the blower specified by the customer at the time of order will be connectable.

Connect to terminals 7 and 8 of the hot air generator blower fault indicator. (Recommended wire size: 1.25-$^{2\ mm^2}$)

Connect to the temperature abnormality terminals 5 and 6 of the hot air generator. (Recommended wire size: 1.25-$^{2\ mm^2}$)

Connect to the overheat terminals 3 and 4 of the hot air generator. (Applicable wire size: 1.25-$^{2\ mm^2}$)

Connect to the hot air generator's outlet sensor terminals 1 and 2 using compensation wire, ensuring correct positive and negative wiring.
(1→Positive, 2→Negative; Applicable Compensation Wire: WX-H)

※Terminals 1 to 8 are for the safety circuit.

※If you provide your own blower, short-circuit safety circuit terminals 7 and 8.

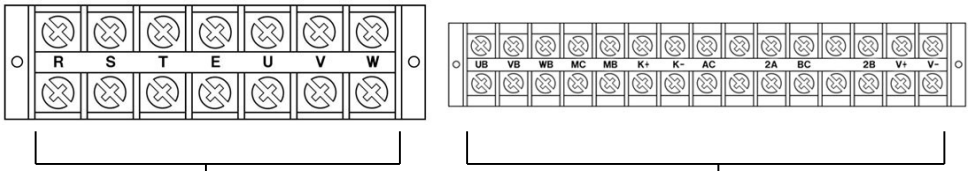
Operating the hot air function without ensuring the safety circuit will not prevent heater wire breakage.

Refer to the wiring diagram for TSK-17B and TRT20A for a wiring example.

## TRT51A 《Compatible Hot Air Generators: TSK-22B・32B・42B(S)・52B(S)》

Heater Control Capacity / Maximum Load Current (at 200V) Three 15 kW or le: ・ 50A

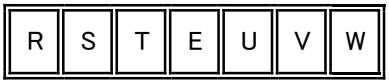
Compatible Blower (Maximum controllable motor current value for Three 130W・250W・750W (4A or less)




Screw size: M6 (Tightening torque: 3.7 N·m)

Screw size: M3.5 (Tightening torque: 1.4 N·m)

● To prevent malfunctions due to noise, etc., the terminals for the outlet sensor, overheat, abnormal temperature, and blower fan malfunction must be wired separately from power lines, motor lines, and harmonic lines (shielding is recommended).




Power Input Termi

Supply factory power (primary side power).

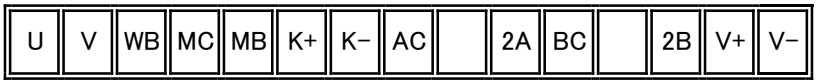
Ground Terminal

Connect the ground wire.

Heater Output Terminals

Connect to the heater power supply terminals U, V, W of the hot air generator.

Determine the wire size considering voltage drop.
(Applicable wires: TSK-21B・31B 3.5-8 mm², TSK-41B(S)・51B(S) 8-22 mm²)




Blower Output Terminals

Connect to the blower power terminals UB and VBWB of the hot

Determine wire size considering voltage drop.
(Applicable wire: 1.25-2 mm²)

※If you provide your own blower, connect the blower's power cable. However, only the blower specified by the customer at the time of order will be connectable.

Connect to the hot air generator's temperature abnormality terminals AC and 2A. (Applicable wire: 1.25-2 mm²)

Connect the hot air generator outlet sensor terminals K+ and K- using compensation wire, ensuring correct positive and negative wiring.
(K+ → Positive, K- → Negative; Applicable compensation wire: WX-H)

Connect to the blower abnormality terminals MC and MB of the hot air generator. (Applicable wire size: 1.25-2 mm²)

Connect the overheat terminals BC and 2B of the hot air generator.
Connect to terminals BC and 2B.
(Applicable wire: 1.25-2 mm²)

Connect to the safety circuit power terminals V+ and V- of the hot air generator.
(Recommended wire size: 1.25-2 mm²)

*Terminals V+ and V- are for the safety circuit.

*If you provide your own blower, short-circuit the blower fault terminals MC and MB.

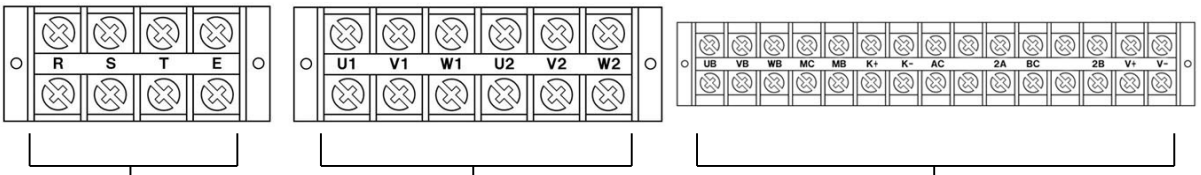
Operating the hot air function without ensuring the safety circuit will not prevent heater wire breakage.

Refer to the wiring diagrams for TSK-22B to 52BS and TRT51A for wiring examples.

## TRT101A 《Compatible Hot Air Generators: TSK-62B(S), 72B(S), 82B(S)》

Heater Control Capacity / Maximum Load Current (at 200V) Three 30 kW or less・50 A × 2 circuits

Compatible Blower (Maximum controllable motor current value for Three 750W・1500W・2200W (10A or less)

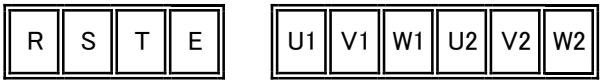



Screw size: M8 (Tightening torque: 9 N·m)

Screw size: M6 (Tightening torque: 3.7 N·m)

Screw size: M3.5 (Tightening torque: 1.4 N·m)

● To prevent malfunctions due to noise, etc., the terminals for the outlet sensor, overheat, abnormal temperature, and blower fan malfunction must be wired separately from power lines, motor lines, and harmonic lines (shielding is recommended).

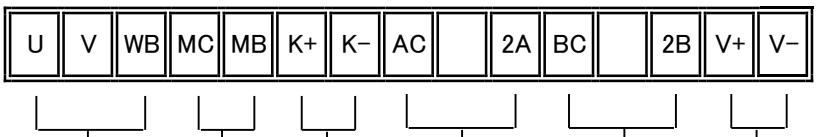



Power Input Termi

Supply factory power (primary side power).

Ground Terminal

Connect the ground wire.




Heater Output Terminals

Connect to the heater power terminals U1, V1, W1, U2, V2, W2 of the hot air generator.

Determine the wire size considering voltage drop.
(Applicable wiresTSK-61B(S)・71B(S) 5.5 to 14 mm², TSK-81B(S) 8-22 mm²)

Blower Output Terminals

Connect to the blower power supply terminals UB, VB, and WB of the hot air generator.
Determine wire size considering voltage drop.
(Applicable wire: 1.25-2 mm²)

※If you provide your own blower, connect the blower's power cable. However, only the blower specified by the customer at the time of order will be connectable.

Connect to the safety circuit power terminals V+ and V- of the hot air generator. (Recommended wire size: 1.25-2 mm²)

Connect the overheat terminals BC and 2B of the hot air generator. Connect to terminals BC and 2B. (Applicable wire: 1.25-2 mm²)

Connect to the hot air generator's temperature abnormality terminals AC and 2A. (Applicable wire: 1.25-2 mm²)

Connect the hot air generator outlet sensor terminals K+ and K- using compensation wire, ensuring correct positive and negative wiring.
(K+ → Positive, K- → Negative; Applicable compensation wire: WX-H)

Connect to the blower abnormality terminals MC and MB of the hot air generator. (Applicable wire size: 1.25-2 mm²)

*Terminals V+ and V- are for the safety circuit.

*If you provide your own blower, short-circuit the blower fault terminals MC and MB.

Operating the hot air function without ensuring the safety circuit will not prevent heater wire breakage.

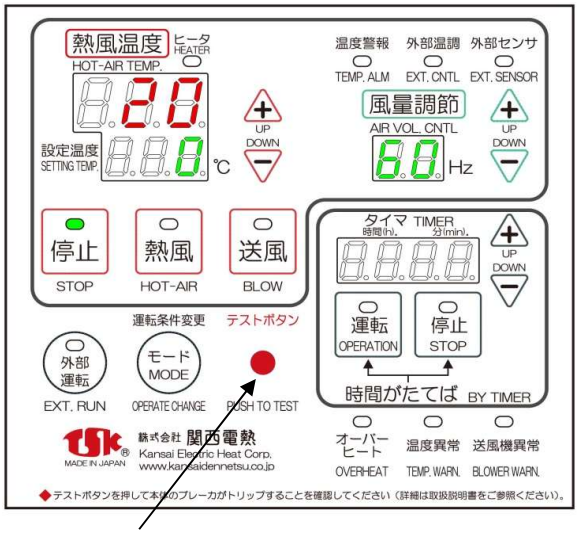
Refer to the wiring diagrams for TSK-62B to 82BS and TRT101A for wiring examples.

# 5. Maintenance and Inspection

## Test Button

This test button is used to verify that the main unit's breaker (NFB) trips correctly during overheating.
Once a month, with the unit powered on but stopped, press the test button for several seconds.
for several seconds to verify that the overheat lamp illuminates, overheat operation indication (see P.15), and the main unit main unit breaker (NFB) trip operation.

After confirmation, turn off the main power (factory power) and the unit's breaker (NFB),
and then turn them back ON.




Test Button

## Self-Inspection

◆For safer operation of this unit, we recommend performing a self-inspection when the usage period exceeds 10 years.

[Self-Inspection Items]

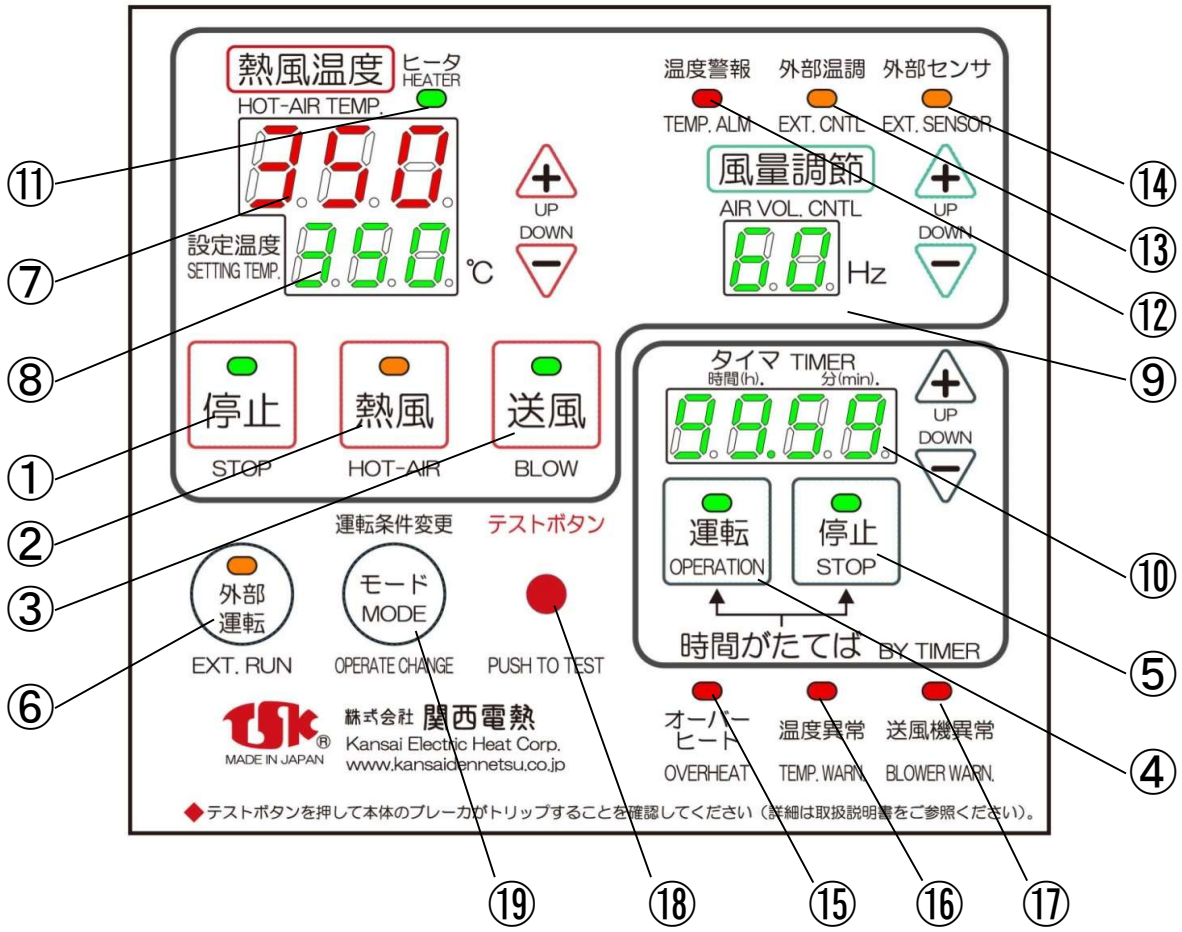
- Measurement of Insulat
- Inspection of Terminal Block
- Inspection and cleaning for foreign obj
- Inspection of electrical componer
- Other visual inspections

For self-inspections, please request assistance from your nearest licensed electrician.

※Caution: Do not perform insulation withstand voltage tests on this unit (already performed at the factory). Doing so may cause malfunctions.

# 6. Names and Functions of Components

## Control Panel (Common to All Models)




① Stop Switch

Used to stop fan operation and hot air operation, and to cancel timer operation. This switch displays the timer setting time.

②Hot Air Switch

Pressing the switch starts hot air operation.

③ Fan Switch

Press the switch to start fan operation.

④ Timer Operation Switch

Pressing the switch allows you to set the time at which operation will start after the time has elapsed.
After setting, press the hot air switch.

⑤ Timer Stop Switch

Press the switch to set the time after which operation will stop.
After setting, press the hot air switch.

⑥ External Operation Switch

Press and hold the switch for 2 seconds to enable operation via the external operation signal and external heater ON/OFF signal.

⑦ Hot Air Temperature Display

Displays the outlet temperature. Switching the operating condition to the external sensor, it displays the external sensor temperature.

⑧ Set Temperature Display

Displays the outlet temperature setpoint. Switching the operating condition to the external sensor, it displays the set temperature of the external sensor.

⑨Airflow Adjustment Display

Displays the set value for airflow adjustment (frequency setting) (inverter equipped models only).

⑩ Timer Setting Display

Displays the set timer duration. Counts down by subtracting time

⑪ Heater Lamp

The heater's ON/OFF status is indicated by lighting up or flashin

⑫Temperature Alarm Lamp

If a temperature alarm setting is entered, the lamp will light up when the temperature reaches the alarm setting value.

⑬ External Temperature Control Lamp

This indicator lights up when the operating condition is switched

⑭ External Sensor Lamp

This light illuminates when the operating condition is switched to

⑮ Overheat Lamp

Lights up when the heater case interior reaches abnormally high temperatures, causing the circuit breaker (NFB) will trip.

⑯Temperature Abnormality Lamp

Illuminates when the discharge temperature is high or the intake temperature exceeds the blower's allowable temperature causing the breaker (NFB) to trip or the blower operation.

⑰ Blower Abnormal Lamp

Lights up when the blower is overloaded, and operation stops.

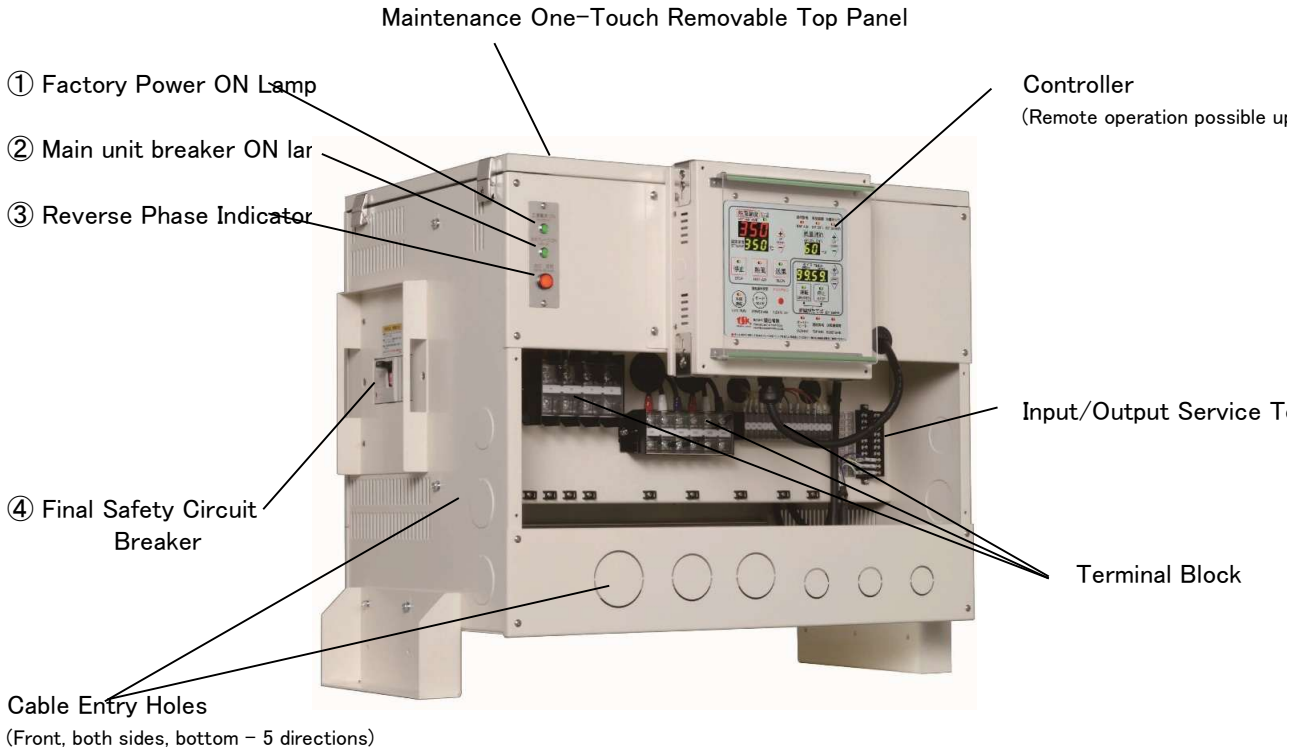
⑱ Test Button

Pressing this button trips the breaker (NFB).

⑲ Mode Switch

Used to change operating conditions.

## MODEL: TRT101A




①Factory Power ON Lamp (Green)

Factory Power (This lamp illuminates when the primary power source is turned ON.

② Main breaker ON lamp (green)

Lights up when the main unit breaker (NFB) is ON. It turns off if the main unit breaker trips due to overheat protection activation.

③ Reverse Phase Indicator (Red)

This lamp illuminates when the primary power supply is out of phase or when the T phase of the primary power supply is missing. If illuminated, swap any two wires of the primary power supply or check for T phase disconnection.

④ Final Safety Circuit Breaker

This breaker trips when the overheat protection activates, disconnecting all circuits. Keep this breaker ON at all times. Do not use the ON/OFF switch as an operating switch.

**《熱風温度、設定温度、風量調節、タイマ表示部の表示文字一覧》**

0 1 2 3 4 5 6 7 8 9 A B C D E F G H I J K L M N O P Q R S T U V W Y

# 7. Service Terminal

## Input Terminals

M3 20P Terminal Block Upper Row Tightening Torque: 0.5 N·m

A1 : External Operation Input/Cut Terminal

Used when starting/stopping via an external signal. Input is compatible with contact output (terminal Voltage DC24V, 7mA or less).

A2 : External Heater On/Off Terminal

Used when turning the heater on/off via an external signal. Input is compatible with contact output (terminal voltage DC 24V, 7mA or less).
Output (terminal voltage DC 24V, 7mA or less).

A3 : Input Common Terminal

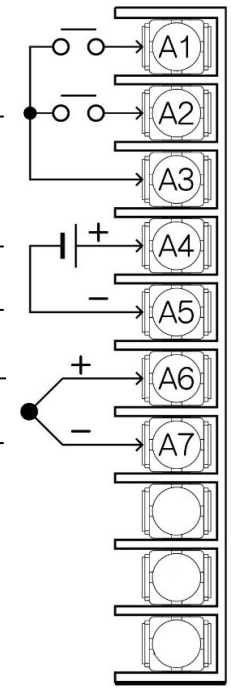
This is the common input terminal for external operation ON/OFF terminal A1 and external heater ON/OFF terminal A3.

A4・A5 : External Temperature Control Terminal

Used when controlling temperature with another temperature controller. Input SSR reverse operation Input the output (DC 12–24 V). At this time, use the unit's temperature controller as an outlet temperature upper limit limiter (A4 → +, A5 → –).

A6・A7 : External Sensor Terminals

Connect terminal K+ of external sensor K350A to A6 and K– to A7.



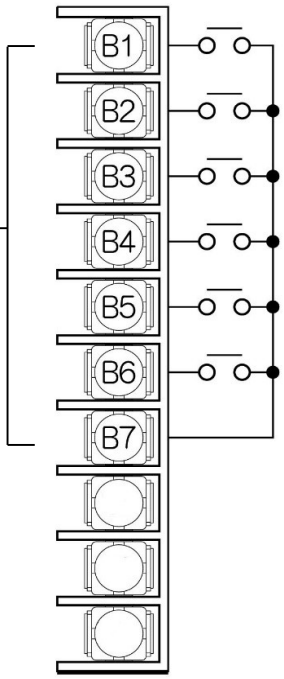

* The terminal voltage for the operation ON/OFF terminal A1 and the heater ON/OFF terminal A2 is DC 24V 7mA or less. Therefore, prepare a relay or similar device with contact capacity capable of switching this voltage.

*When using the operation ON/OFF and heater ON/OFF functions, press the external operation switch on this unit to change to external operation mode.

## 《Output Terminals》

M3 20P Terminal Block Lower Row Tightening Torque: 0.5 N·m

Contact capacity: DC 5V, 10mA or more; DC 30V, 1A or less (voltage-free contact signal output




B1 : Blower output terminal
This terminal turns ON during blower operation.

B2 : Heater Output Terminal
This terminal turns ON during hot air operation.

B3 : Temperature Abnormality Overheat Output Terminal
This terminal turns ON when a temperature abnormality occ

B4 : Temperature alarm abnormal temperature output termin
This terminal turns ON when a temperature alarm output oc

B5 : Blower Abnormal Output Terminal
This terminal turns ON when a fan abnormality occurs.

B6 : Overheat Temperature Alarm Output Terminal
This terminal turns ON during overheating.

B7 : Output Common Terminal

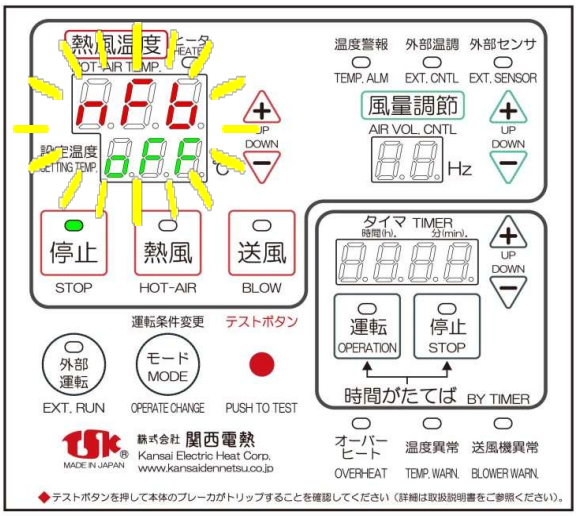
Caution : When using the service terminal, always disconnect the power supply before wiring. Wiring while energized may result in electric shock. Also, be sure to attach the terminal cover after wiring.

Caution : Avoid adjacent wiring or bundling of service terminals with AC power lines, power lines, or harmonic lines.

# 8. Normal Operation

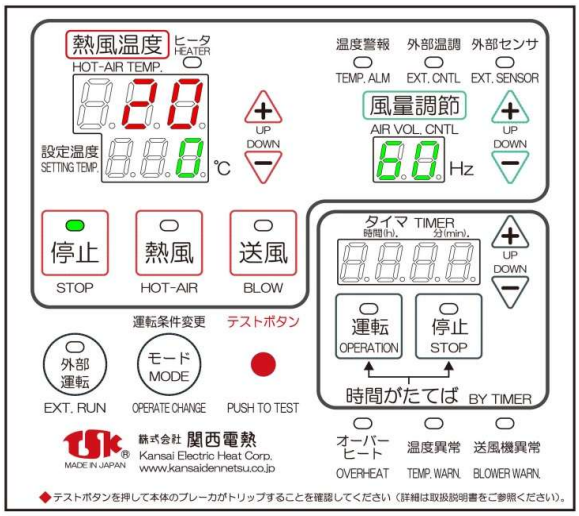
## ①Turn ON thepower supply (primary side power).

The factory power lamp (green) and stop lamp (green) will illuminate. will display 'NFB' and the set temperature section will display 'OFF' flashing.




## ②Turn ON the main unit breaker (NFB).

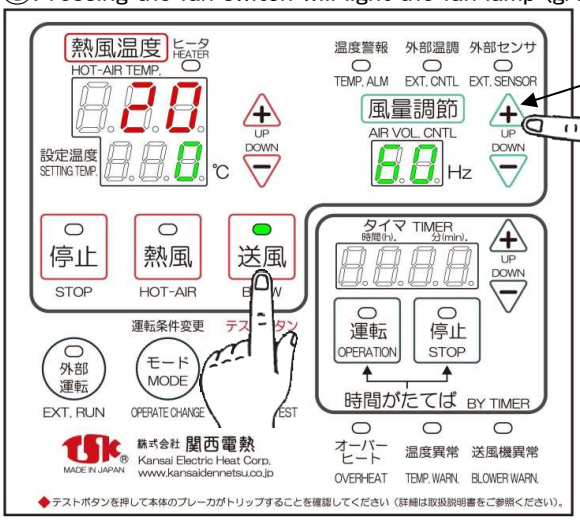
The main unit breaker ON lamp (green) will light up, the hot air temperature section will display the current temperature, the set temperature section displays '0', and the air volume adjustment section displays '60 (Frequency) will be displayed (during initial operation).




*Operation is not possible in this state.

※On subsequent operations, the SV setting and fan speed display the previous settings.

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



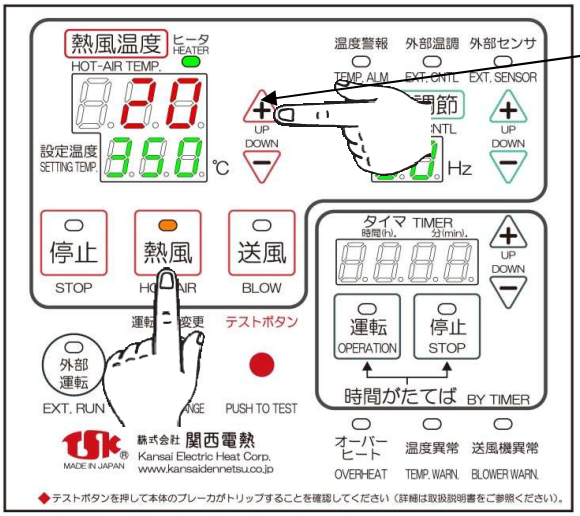

Fan Speed Setting (Frequency Setting)

Use the up/down keys to change the setting from 20 to 60 Hz in 1 Hz increments.

※For magnet-type automatic temperature controllers, the airflow adjustment
will not be displayed.

*Even if the airflow is set to the minimum setting of 20Hz, will not reach the maximum temperature if the blower motor is operating under near-no-load conditions (to ensure adequate cooling of the blower motor). to ensure adequate cooling for the blower motor). In this case, install a damper at the intake port and restrict the airflow setting.

## ④ Pressing the hot airwill 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.

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

# 9. Timer Operation/Timer Stop

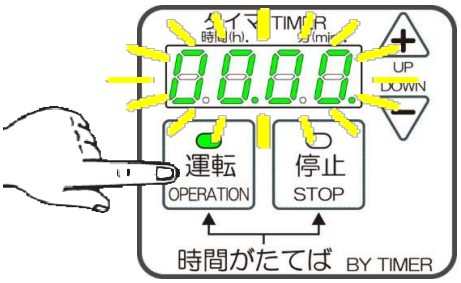
Before starting or stopping timer operation, set the hot air temperature and airflow volume as desired.

Perform timer settings while the unit is stopped (timer settings cannot be made during fan operation or hot air operation).

## ● Timer Operation (Starts after time elapses)

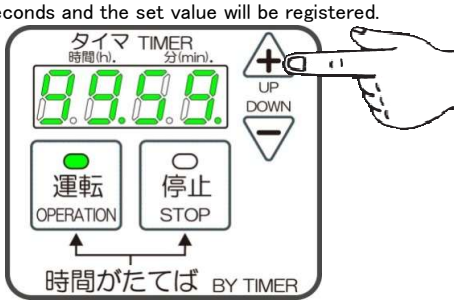
Press the timer operation switch.

The timer operation lamp (green) will light up, and the timer display will show '00.00.' will flash, or the previous setting time will be displayed.

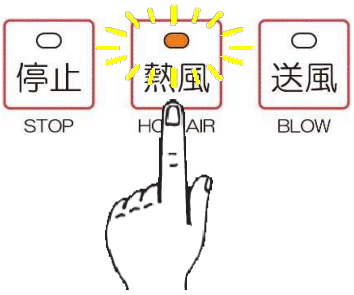


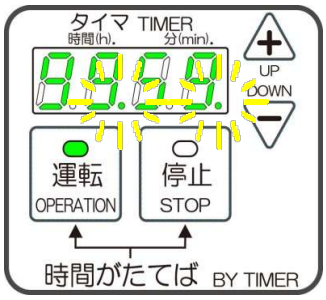

Use the up/down keys to set the desired time.

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




Press theAir Operation switch.




The time countdown (timer setting time subtraction) will begin (dot display flashes), and when the time count reaches '00.00.' hot air operation will begin. During the time countdown, the hot air lamp (orange) will flash. After hot air operation begins, it will switch to a steady light.

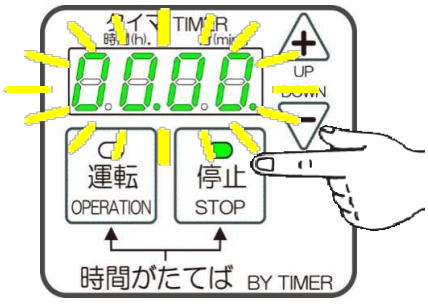
*After the time count ends, the timer display will show '00.00.'

※Pressing the stop switch will halt timer operation and timer counting will stop.

## ● Timer Stop (Stops after time elapses)

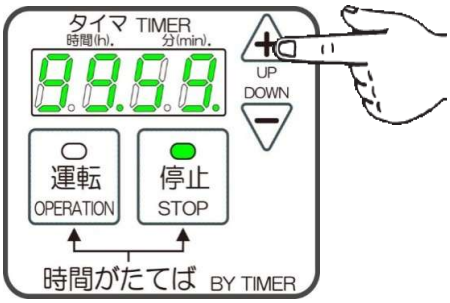
Press the timer stop switch.

The timer stop lamp (green) will light up, and the timer display will show '00.00.' will flash, or the previous set time will be displayed.

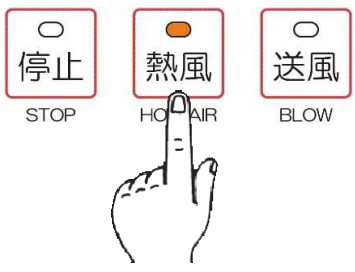


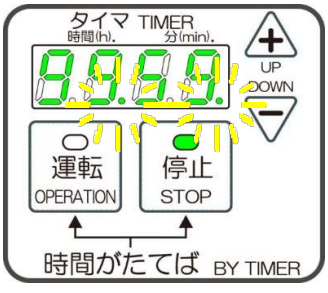

Use the up/down keys to set the desired time.

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




Press theAir Operation switch.




Time counting (timer countdown) begins (dot display flashes), and hot air operation will proceed. When the time count reaches '00.00.', hot air operation stops. During hot air operation, the hot air lamp (orange) illuminated, and switches to flashing after hot air operation ends.

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

※Pressing the stop switch will halt timer operation and timer counting.will stop.

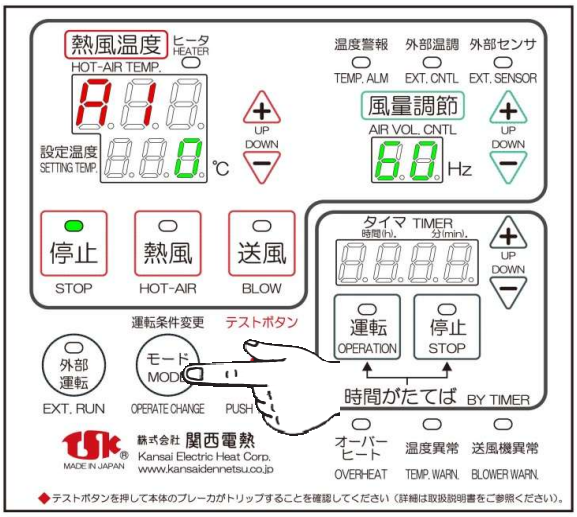
# 10. When Using an External Sensor

● You can control temperatures in distant locations using an external sensor. After connecting the external sensor to the external sensor input terminal block on the service terminal, and then configure the settings.

● When using an external sensor, the set SV value for hot air temperature corresponds to the temperature at the external sensor location, and the indicated SV value for hot air temperature indicates will be the temperature at the external sensor location.

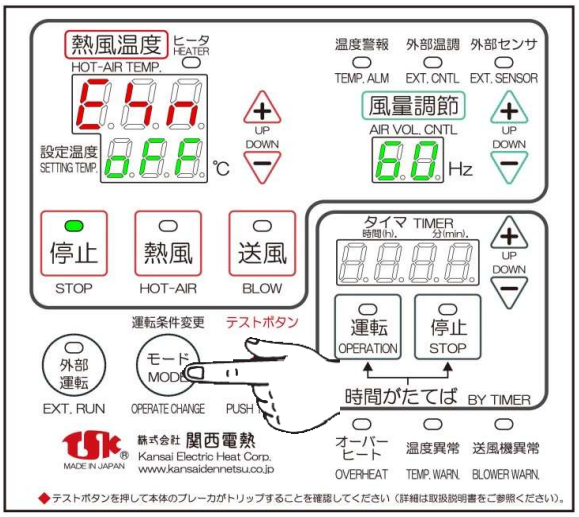
## ①Press and hold theswitch (for about 2 seconds).

The hot air temperature section will display 'A1', and the set temperature section will display '0'.



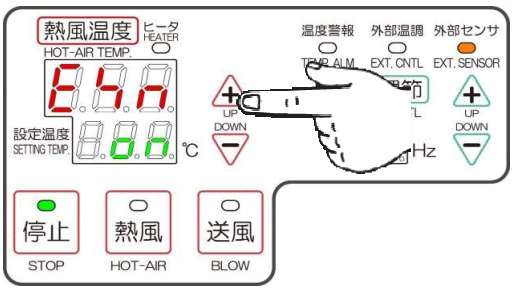

## ②Press the mode switch twice again.

The hot air temperature section will display 'ESN', and the set temperature section will display 'OFF'.



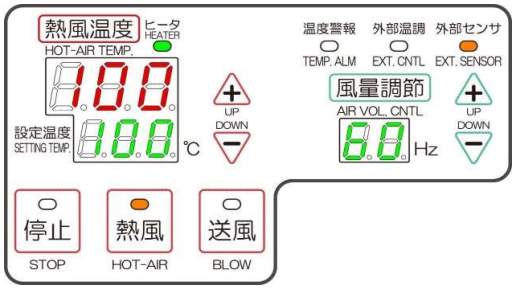

## ③Use the up key to set thetemperature to 'ON'.

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




## ④Start hot air operation. Hot

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




※When connecting the external sensor, ensure the correct polarity (+/−) is connected to the external sensor signal terminals A6 and A7.

※ If external sensor settings are configured without an external sensor connected, the burnout function will activate, preventing operation (se

※ If you no longer use the external sensor, reset the SV setting to 'OFF' as described in step ③ above.

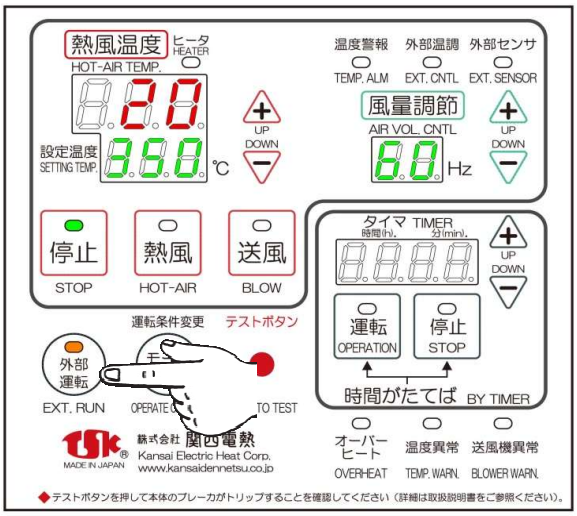
# 11. When Using External Operation

※ After stopping the hot air generator via external operation, the unit cannot be restarted for approximately 5 seconds.

● External signals can be used to stop the hot air generator and turn the heater on/off.

①While the unit is stopped, press and hold the external operation switchapprox. 2 seconds).

The external operation lamp (orange) will light up.




②Operate using the external control signal.

When the external operation signal is ON and the external heater ON/OFF signal is OFF, The fan operation lamp (green) will illuminate.


When operating in hot air mode with the external operation signal ON and the external heater ON/OFF signal ON, The hot air lamp (green) will light up.


*After stopping the hot air generator via external operation, restarting is not possible for 5 seconds.(The restart standby state is indicated by the fan or hot air lamp flashing; restart occurs 5 seconds after stop, and starts 5 seconds later). Also, frequent ON/OFF cycling of the external heater will shorten the internal relay's lifespan. For high-frequency heater ON/OFF operation, ON/OFF cycles.

※During external operation mode, the fan switch and operation 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.

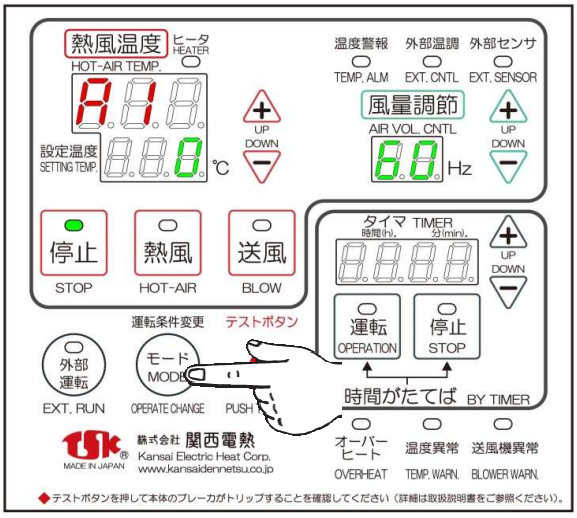
* For external operation input and external heater ON/OFF input, apply a voltage-free contact output (terminal voltage DC 24V 7mA or less).

# 12. Setting the Temperature Alarm

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

①Press and hold theswitch (for about 2 seconds).

The display will show 'A1' in the hot air temperature section and '0' in the setpoint temperature section.




*Temperature alarms do not stop the unit's operation.

*If the temperature alarm setting is 0, the temperature alarm out

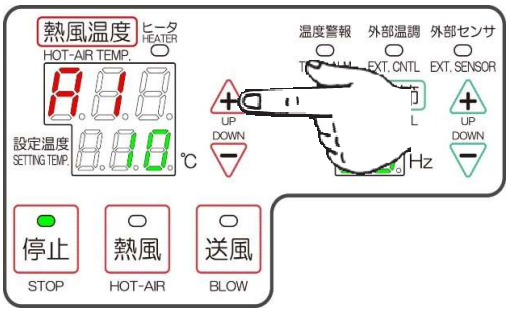
* The temperature alarm output is a voltage-free contact signal (contact capacity: AC 250V 3A, DC 30V 3A) from terminal B4.

contact signal (contact capacity: AC 250V 3A, DC 30V 3A).

.

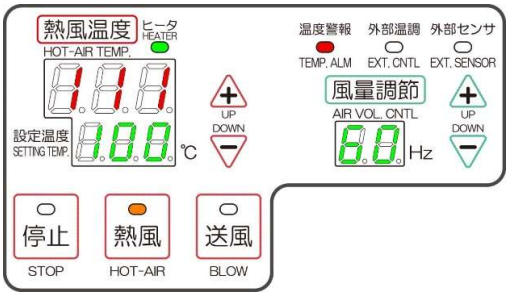
②Use the up/down keys to set the desired temperature range.

After setting, press the mode switch three times to return to the normal operation display. ③ Start hot air operation.




③ Start hot air operation.

If set to '10', the alarm lamp (red) will illuminate when the temperature is +10° C or higher, or −10° C or lower than the set discharge temperature, and an alarm will be output from the service terminal (excluding the initial temperature rise when starting hot air operation).



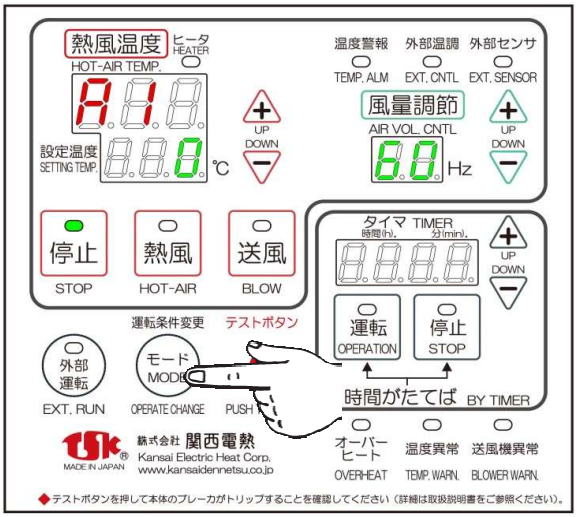
# 13. When Using an External Temperature Controller

●The hot air generator can be controlled by signals from an externally installed temperature controller. In this case, the unit's built-in temperature controller should be used as an upper discharge temperature limiter.

● When using the external temperature control function, the hot air temperature setting (set SV value) and the hot air temperature indication (indicated SV value) will correspond to the temperature of the outlet sensor.

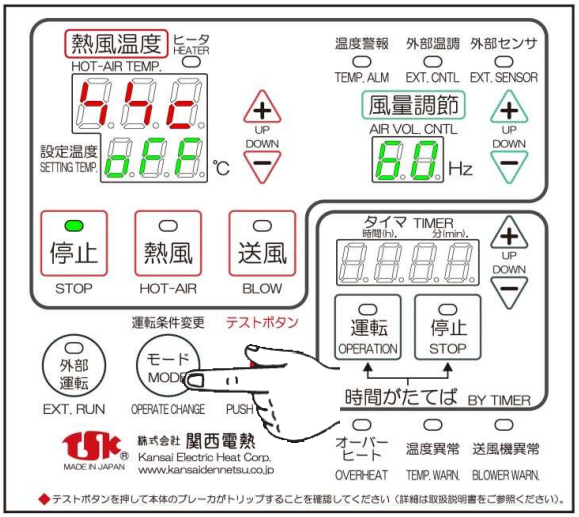
①Press and hold theswitch (for about 2 seconds).

The display will show 'A1' in the hot air temperature section and '0' in the setpoint temperature section.



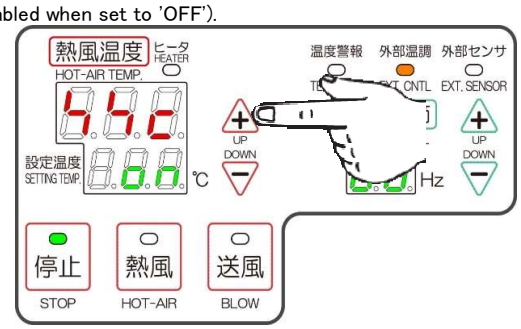

Press the mode switch once again..

The hot air temperature section will display 'SSC', and the set temperature section will display 'OFF'.



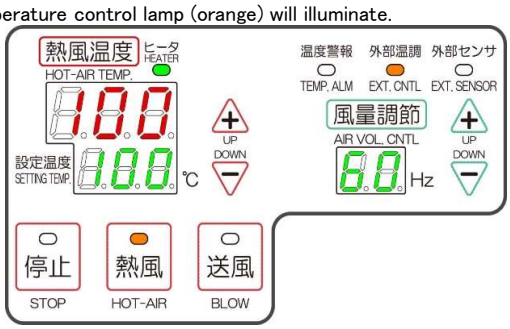

③Use the up key to settemperature settingto 'ON'.

After setting, press the mode switch twice to return to the normal operation display(External temperature control is disabled when set to 'OFF').




④Start hot air operation. Hot

When the external temperature control setting is turned to 'ON', the external temperature control input is disabled and the external temperature control lamp (orange) will illuminate.




* For external temperature control input, apply an SSR drive reverse operation output (DC 12-24V) to external temperature control signal terminals A4 and A5.

*When using the external temperature control function, the temperature is controlled based on whichever is reached first: the set temperature of the externally set temperature controller or the outlet set temperature of the hot air generator unit. Therefore, determine each temperature considering heat dissipation from piping, etc.

※If you no longer use the external temperature control function, reset the SV setting in item ③ above to 'OFF'.

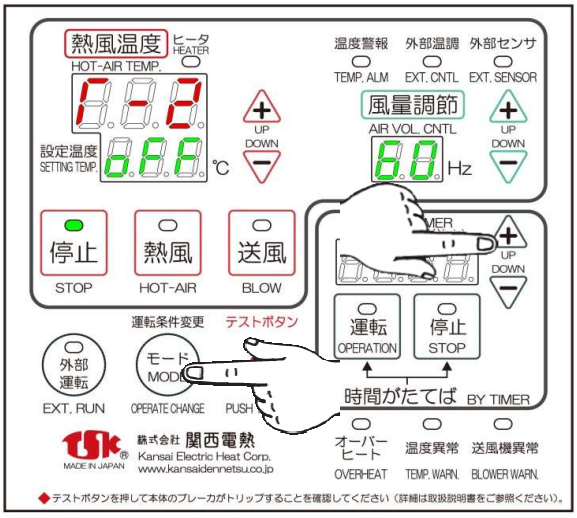
# 14. When using the cooling operation function

● The cooling operation function is available only when selecting timer-based operation stop. After performing timer-based hot air operation, the system will run for a specified period of time before stopping.

*Our hot air generators are designed with low wattage density, eliminating the need for cooling operation to prevent heater breakage.Therefore, use this cooling operation function to prevent burns on piping, etc., after stopping operation, or to cool down dried/heated products after processing.

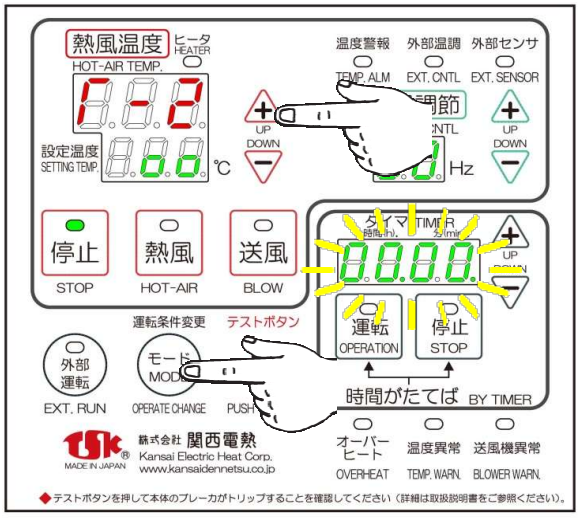
①While in the stopped state, press and hold the mode switch while pressing and holding the up key on the timer.Press and hold the mode up key while.

The hot air temperature section will display 'T-2', and the set temperature section will display 'OFF'.



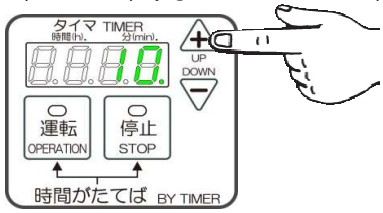

②Use the up key to set the temperature display to 'ON', then press the mode switch once.Press the modeonce.

The timer display will flash '00.00.'.

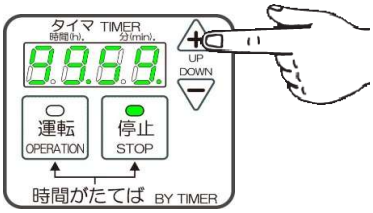



③Use the up/down keys to set the desired cooling time.

After setting, press the mode switch once to return to the normal operation display.⑤ Press the Hot Air Operation Switch.



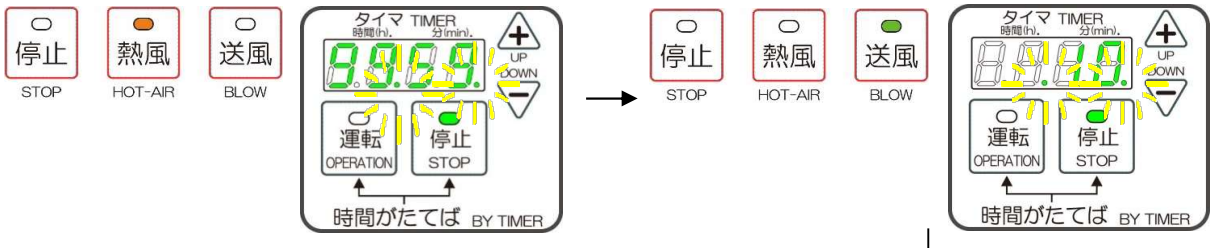

④Press the timer stop switch to set the hot air operation time.Set.



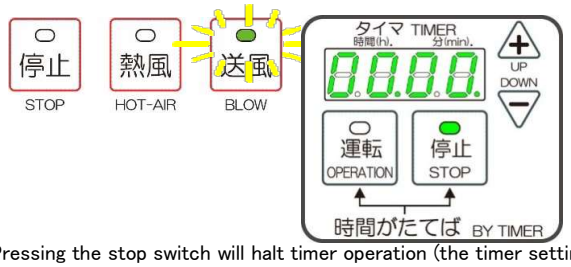

⑤ Press theAir Operation Switch.

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

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




When the time count reaches '00.00.', the cooling operation (fan operation) will stop, and the fan operation lamp (green) will flash.




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

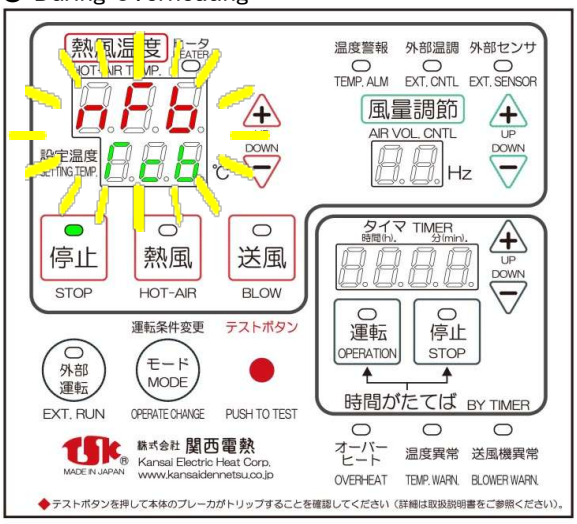
# 15. Fault Detection

◆When an abnormality is detected, the abnormality indicator will light up and the buzzer will sound.
the buzzer sound will also stop.

## 15-1 Overheating

If the heater case reaches an abnormally high temperature, it is detected as overheating. Alternatively, if the overheat sensor for heater case temperature control is broken, it is detected as a burnout, causing the main breaker (NFB) to trip and all operations to stop. If the main breaker (NFB) trips, all operations will stop.

● During Overheating




The overheat lamp (red) illuminates, and TCB flashes on the hot air temperature display and the NFB/set temperature section. The NFB indicator flashes in the set temperature section.

《Main Causes》

・Clogging of the intake mesh or filter
・Blower motor lockup due to foreign object ingress
・Insufficient exhaust openings in the furnace body, etc.
・Resistance at the outlet due to proximity of the workpiece (resulting in significant pressure loss is high)

《Reset Procedure》

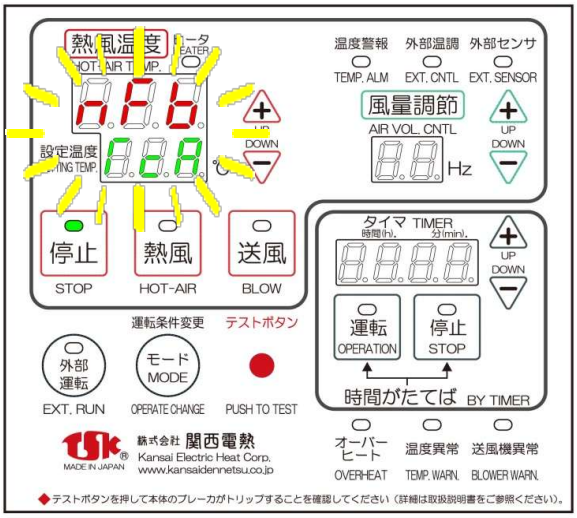
After eliminating the cause of overheating and allowing sufficient cooling, turn off the main power supply (factory power) and the unit breaker (NFB) OFF, then turn them ON again.

Caution: Always disconnect the main power supply (factory power) before checking or adjusting wiring during an abnormality.

## 15-2 Temperature Abnormal

If the outlet temperature exceeds the upper limit or the intake temperature exceeds the upper limit, the hot air generator will stop or switch to fan-only operation. Operation will also stop in case of sensor burnout (e.g., wire breakage) or abnormal internal temperature of the hot air generator.

● If the outlet temperature exceeds the upper limit at the outlet sensor section




The temperature abnormality lamp (red) will illuminate, NFB will flash on the hot air temperature display, TCA will flash on the set temperature display, and the main breaker (NFB) will trip, halting all operations.

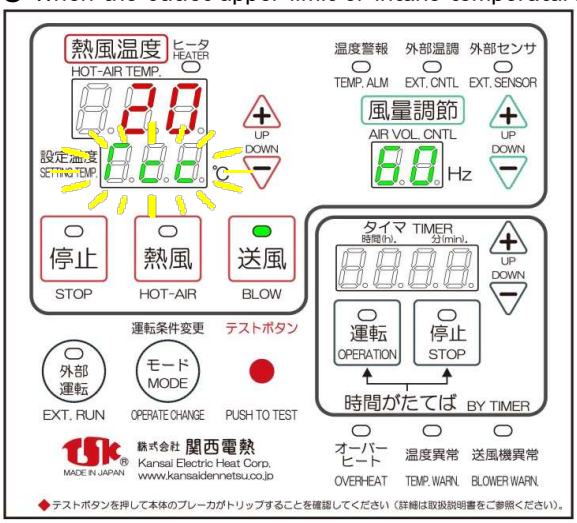
《Main Causes》

・Exhaust outlet temperature limit exceeded when using e
・Airflow reduction due to excessive pressure loss
・Airflow reduction due to clogging of the intake mesh or f

《Reset Procedure》

Remove the cause of the outlet temperature limit being exceeded and cool sufficiently. After cooling sufficiently, turn off the main power supply (factory power) and the unit breaker (NFB) and then turn them back ON.

● When the outlet upper limit or intake temperature




The temperature abnormality lamp (red) illuminates, the current discharge temperature lights up in the hot air temperature section, will illuminate, TCC will flash in the set temperature section, and the unit will enter fan operation mode.

《Main Causes》

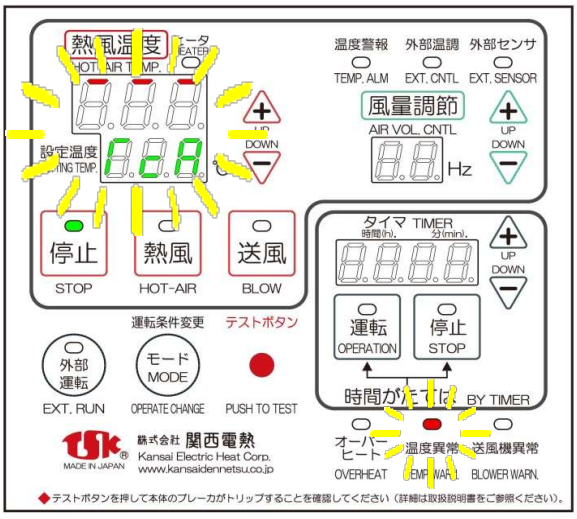
・When the hot air circulation temperature exceeds the upper limit of the hot air generator's intake gas temperature.
・ When the outlet and inlet temperatures drop
・Exhaust outlet temperature limit exceeded when using e
・Airflow reduction due to excessive pressure loss
・Airflow reduction due to clogging of the intake mesh or f

《Reset Procedure》

After the outlet and inlet temperatures have dropped.

※In this case, the outlet upper limit indicates an abnormality at the outlet upper limit sensor installed inside the hot air generator.

● When the outlet sensor burns out




The temperature abnormality lamp (red) flashes, the hot air temperature display shows "---", the set temperature display flashes "TCA", and the main breaker (NFB) tripsusing all operations to stop.

《Main Causes》

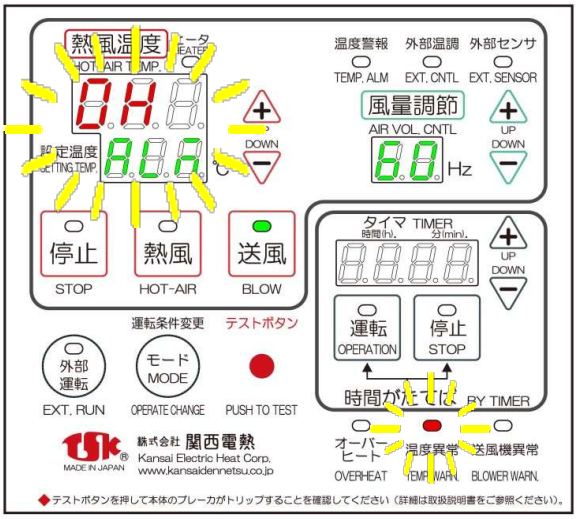
・Outlet sensor wire break
・Outlet sensor wiring break
・Disconnection of outlet sensor wiring

《Reset Procedure》

Turn off the primary power supply and request repair.

Caution: Always disconnect the main power supply (factory power) before checking or adjusting wiring during an abnormality.

● Internal temperature abnormality in automatic temperature regulator (TRT)




The temperature abnormality lamp (red) flashes, "OH" flashes on the hot air temperature display, "ALM" flashes on the set temperature display, and the unit enters fan operation mode.

《Main Causes》

・High ambient temperature where the automatic tempera
・Impact of furnace body heat dissipation temperature wh

《Reset Procedure》

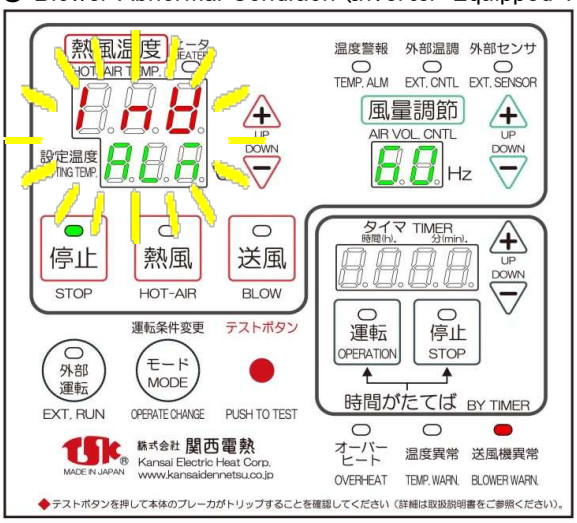
Stop operation using the stop switch and allow the internal temperature of the hot air generator to drop. and then turn the main breaker (NFB) OFF to reset.

Caution: Always disconnect the main power supply (factory power) before checking or adjusting wiring during an abnormality.

## 15-3 Blower Abnormal

When the blower experiences overload, overcurrent, or lockup, all operations of the hot air generator will stop.

● Blower Abnormal Condition (Inverter-Equipped Type)



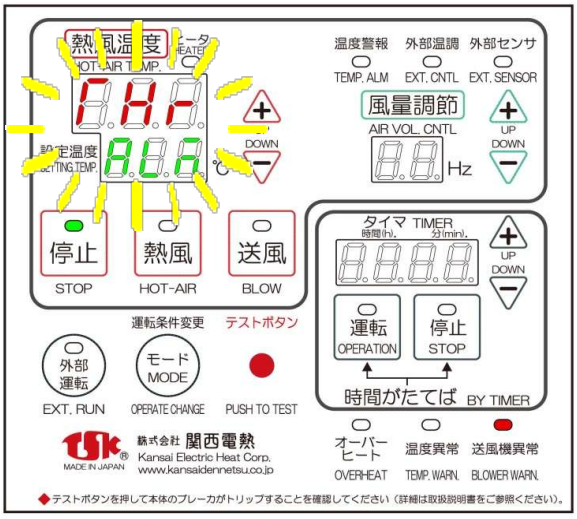

The blower abnormality lamp (red) illuminates, and "INV" flashes on the hot air temperature display, and "ALM" will flash in the set temperature section.

《Main Causes》
- Bearing wear
- Abnormal voltage (voltage outside rated range)
- Piping with high pressure loss
- Use of nozzles with extremely narrow orifices

《Reset Procedure》

An abnormality will be displayed on the internal inverter panel. After confirming the displayed content, turn the main unit breaker OFF and report the displayed information.

● Blower Abnormal Condition (Magnet-Equipped Type)




The blower fault lamp (red) will illuminate, and "THR" will flash in the hot air temperature section, and ALM will flash in the set temperature section.

《Main Causes》
- Bearing wear
- Abnormal voltage (voltage outside rated range)
- Piping with high pressure loss
- Use of nozzles with extremely narrow orifices

《Reset Procedure》

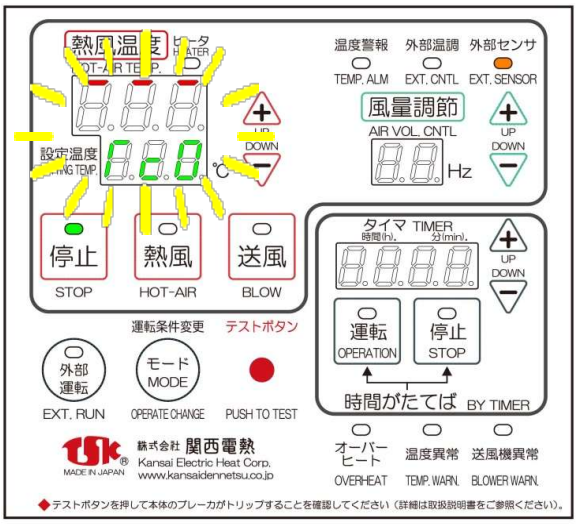
After identifying and resolving the cause of the abnormality, (NFB) once, then turn it back ON.

Caution: Always disconnect the main power supply (factory power) before checking or adjusting wiring during an abnormality.

## 15-4 Other Abnormalities

● When the external sensor burns out

When using an optional external sensor to manage temperatures at remote locations, if the external sensor experiences a burnout due to a broken wire or similar issue, The hot air generator will stop.




The"Hot Air Temperature" sectionwill display"----", and "TC0" will flash in the set temperature section. (The external sensor lamp remains lit).

《Main Causes》

・External sensor wire break

・External sensor compensation wire breakage

・External sensor terminal disconnection

・External sensor mode misconfiguration (when external sensor is not in use)

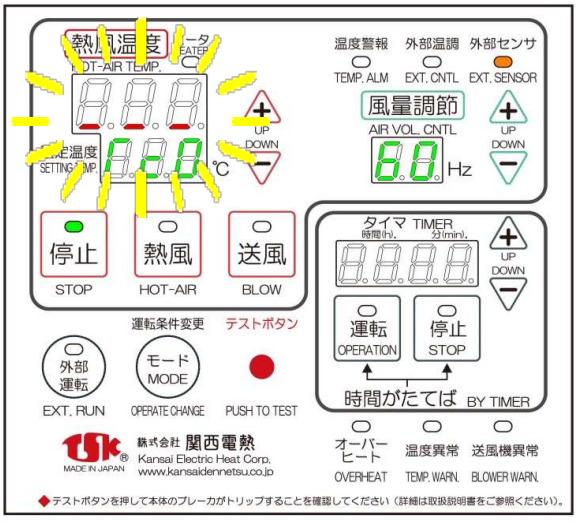
《Reset Procedure》

・After repairing the external sensor breakage and improving the wiring condition, press the stop switch to clear the alarm.

・If the external sensor is not in use, OFF (see "10. Using External Sensors" on P.11).

● Reverse connection of any temperature sensor or detection of negative temperatures

If any temperature sensor (including external sensors) is reverse-connected, or if a temperature of -15° C or lower is detected (internal temperature sensor only -5° C), the hot air generator will stop.




The display for each sensor will flash onthe hot air temperature sectionand the set temperature section.

External Sensor : TC0 Outlet Sensor : TCA

《Main Causes》

・Reverse connection of external sensor

・Reverse connection due to wiring adjustments on each sensor (excluding external sensors)

・Ambient and intake temperatures below freezing

《Reset Procedure》

After checking the external sensor or improving the sub-zero conditions, you can clear the error by pressing the stop switch. For reverse connections other than the external sensor, please request repair. For reverse connections other than external sensors, please request repair.

● Phase Reversal Error

If the power cord connections are reversed, the hot air generator will become inoperable.


All displays will show the same content as when the main breaker (NFB) is ON, and the separate reverse phase lamp (red) will illuminate.will illuminate.

《Main Causes》

・Reverse Phase Connection of Power Cord

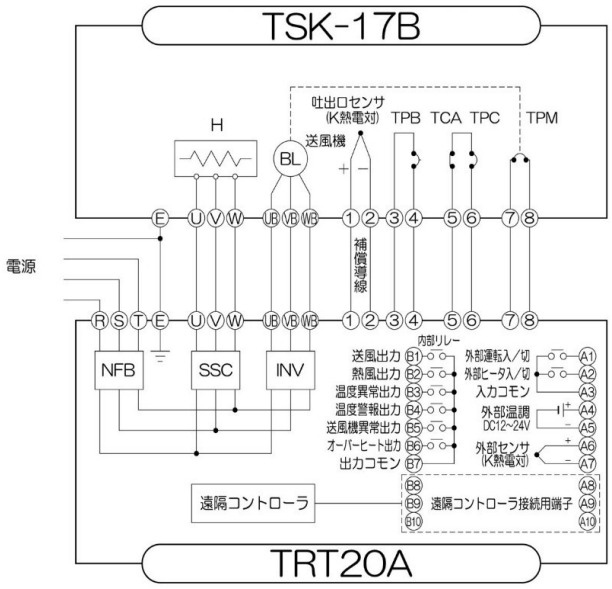
《Reset Procedure》

Swap any two of the power connection wires.

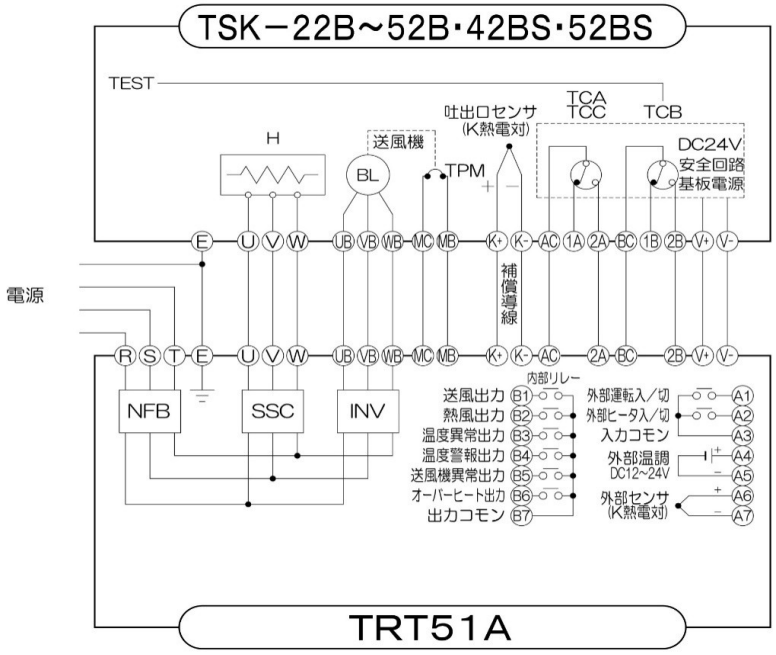
Caution: Always disconnect the main power supply (factory power) before checking or adjusting wiring during an abnormality.

# 16. Wiring Diagram

## Wiring Diagram for TSK-17B and TRT20A




## Wiring Diagram for TSK-22B to 52B, 42BS, 52BS and TRT51A




● Connect as shown in the diagram above.

● Provide a dedicated circuit for the power supply and ensure sufficient capacity.

● Determine the power supply wires, heater wires, and blower wires considering the required capacity and length.

● Use shielded compensation wires for terminals 1 and 2.

● Use shielded wires appropriate for the purpose for terminals 1 to 8.

●Keep wiring as short as possible.power lines※1, motor lines,high-frequency lines※2, or similar wiring through the same duct.

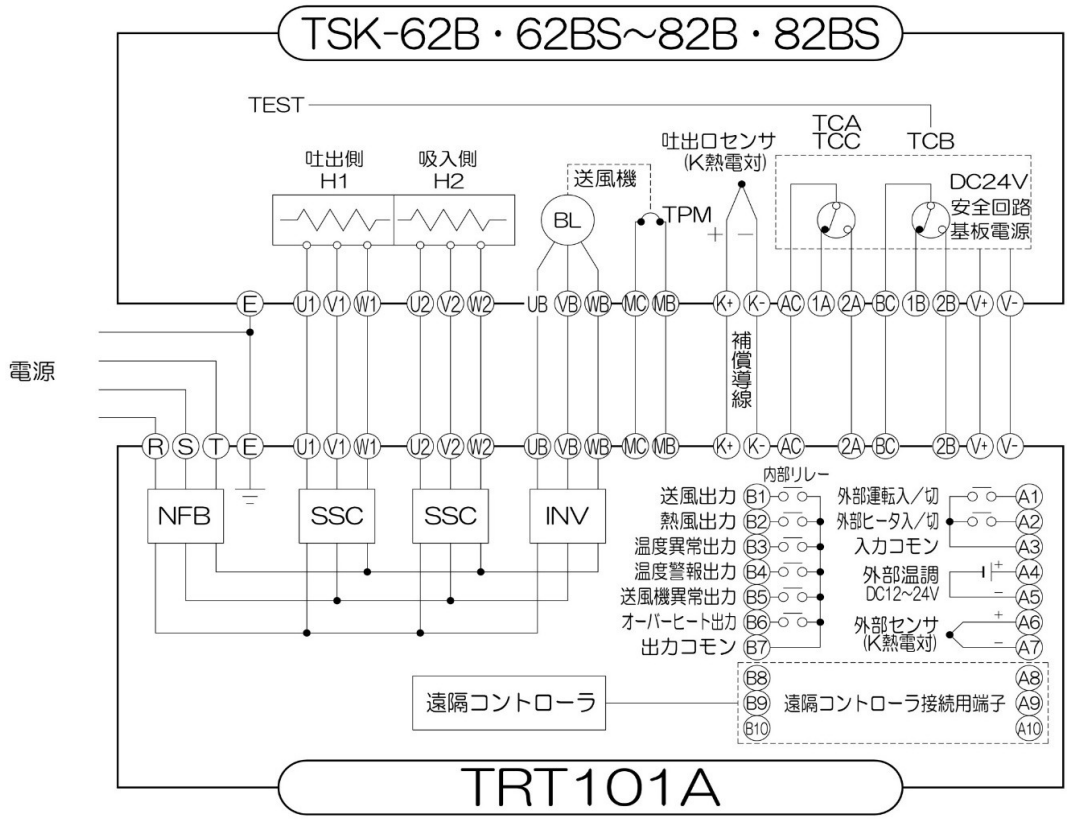
●Do not run them in the same conduit as power lines※1, motor lines, high-frequency lines※2, etc., nor run them in parallel or bundle them together. Exposure to noise can cause malfunctions.

●Have a licensed electrician perform power connections and grounding work.

※1 Power lines refer to NFB's R, S, T, and SSC's U, V, W.

※2 Power lines and high-frequency lines refer to UB, VB, and WB.

# Wiring Diagram for TSK-62B/62BS and TRT51A




● Connect as shown in the diagram above.
● Provide a dedicated circuit for the power supply and ensure sufficient capacity.
● Determine the power supply wires, heater wires, and blower wires considering the required capacity and length.
● Use shielded compensation wires for terminals 1 and 2.
● Use shielded wires appropriate for the purpose for terminals 1 to 8.

●Keep wiring as short as possible.power lines※1, motor lines,high-frequency lines※2, or similar wiring through the same duct.

●Do not run them in the same conduit as power lines ※1, motor lines, high-frequency lines※2, etc., nor run them in parallel or bundle them together. Exposure to noise can cause malfunctions.

●Have a licensed electrician perform power connections and grounding work.

※1 Power lines refer to NFB's R, S, T, and SSC's U, V, W.

※2 Power lines and high-frequency lines refer to UB, VB, and WB.

# 17. Controller Remote

●This unit allows the controller section to be detached and remotely operated up to 10m (10m remote cable included as standard equipment).

《Installation Method》

Install the detached controller using the following methods and secure it firmly.

・Flush-mount installation into the control panel (use the included screws).

・Free-standing or suspended installation using mounting brackets

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・Wall-mounted installation using mounting brackets

*The remote cable can be attached to any side of the controller (top, bottom, left, or right; shipped with bottom attachment). Use the cable entry holes (knockouts) on each side to install it at any desired position. Also, if you change the installation position, please protect the lower cable entry hole by installing the included rubber bushing.

※The product may differ slightly from the photo.

Caution: Do not route or bundle the remote cable adjacent to AC power lines, power lines, or harmonic lines. Noise may damage internal electronic components.

Caution: When performing remote controller operations, always disconnect the main power source (factory power supply) first.

# 18. Warranty

- The warranty period for this unit is one year from the date of purchase.
- If the unit malfunctions during normal use in accordance with the instruction manual within the warranty period, we will repair it free of charge based on the following terms. However, for service calls requiring travel over 50 km from our Osaka headquarters or Tokyo branch office, or to remote islands, actual expenses for transportation and lodging will be charged.
- We assume no responsibility whatsoever for any expenses, profits, losses, or other damages incurred due to this device.
- The warranty for repaired parts and workmanship shall be valid for three months after repair.
- The following cases are not covered by the warranty:
    - Failure or damage caused by incorrect use, careless handling, or abnormal voltage.
    - Disassembled or modified items.
    - Damage caused by overheating not attributable to our product.
    - Damage, malfunction, or loss caused by lightning strikes, earthquakes, typhoons, floods, fires, or salt damage.
    - Rust formation or electrical leakage due to condensation.
    - Damage caused by dust, debris, lint, oil mist, etc.
    - Electrical leakage or malfunction caused by the adhesion of conductive carbon fibers or exposure to acidic or corrosive gases.
    - Failure or damage caused by transportation, moving, dropping, etc., after purchase.
    - Failure to settle payment.
    - Use not in accordance with the instruction manual.
- We will not bear the costs for the following:
    - Consumable parts, painting.
    - Inconvenience, loss, or secondary losses. (e.g., telephone charges, compensation for lost business hours, commercial losses, etc.)
    - Transportation and lodging expenses incurred during on-site repairs.
- We cannot provide on-site repairs if the equipment is installed in locations that are difficult to access, dangerous, or at high elevations.
- This warranty is valid only within Japan.

  If our products purchased within Japan are exported overseas, the warranty will no longer apply.
  In such cases, warranty coverage will only apply to products returned to our factory for in-house repair.
  Furthermore, the customer shall bear all costs associated with import/export and transportation required for bringing the product in for repair and returning it after repair.

Hot Air Generator, Manufacturer and Distributor

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