

This instruction manual must be delivered to the end user.

For safekeeping

3-001 Created: March 2025

TSK Hot Air Generator

Mold Dryer X-5MS

● **Be sure to read before use.**

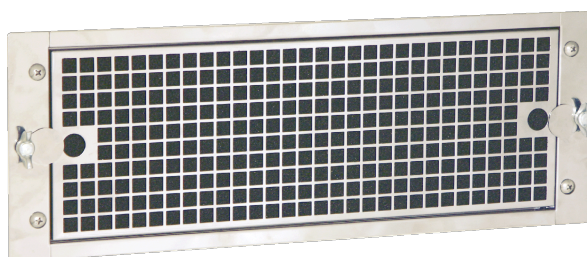
- ◆ Thank you for purchasing the TSK Hot Air Generator.
- ◆ Please verify that the model, part number, and voltage on the nameplate match your ordered product.

For operation of the hot air generator, please read the 'Instruction Manual: Basic Operation'.



1. Precautions for Use
2. Installation
3. Piping
4. Power Supply
5. Maintenance and Inspection
6. Names and Functions of Parts
7. Anomaly Detection
8. Other Functions

TSK Hot Air Generator
Electric Hot Air Mold Dryer
•X-5MS



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Kansai Electric Heat Corp.

1. Precautions for Use※ Be sure to check before use.

To ensure trouble-free operation of the mold

◆ This section lists important precautions that have caused malfunctions in the past. Please compare these with your company's usage methods and inquire accordingly.

- Always clean the intake filter (standard equipment) of the mold dryer. Clogging of the filter may cause abnormal overheating inside the heater, potentially preventing operation.
- The X-5MS is equipped with a control panel internal filter, so please clean it regularly. If clogging becomes severe, dust adhering to the filter may enter the control panel interior leading to malfunction of the mold dryer.
- If the mold dryer installation environment contains conductive airborne particles such as dust, powder, carbon fibers, oil, oil fumes, oil mist, moisture, or water vapor in the ambient conditions of the mold dryer installation site. If these substances adhere to or enter the hot air generator and cause malfunction of the hot air generator.
- Cannot be used in environments with combustible gases, flammable gases, plating, or corrosive atmospheres. Please consult us beforehand.
- Keep the mold dryer's circuit breaker (ELB) ON at all times. Do not use the ON/OFF switch as an operating switch. Do not use it as an ON/OFF switch. Surge voltage may damage internal electronic components.
- Flexible hose piping to the mold dryer's outlet or inlet will inevitably leak hot air due to the characteristics of flexible hoses will inevitably cause hot air leakage. Leaked high-temperature hot air may flow back into the mold dryer, damage the electronic components in the control panel. Therefore, use the enclosed air leak prevention glass tape provided to install the flexible hose piping to the outlet or inlet.
- Applying voltage to input terminals A1 to A10 and output terminals B8 to B10 will cause malfunction. Output terminals B1 to B7 will also malfunction if voltage exceeding the rated value is applied. (When using a remote controller... optional)
- Do not route service terminals adjacent to or bundle them with AC power lines, power lines, or harmonic lines. Do not bundle or service terminals alongside AC power lines, power lines, or harmonic lines. Noise may damage internal electronic components. (When using a remote controller... optional)
- Do not stop the mold dryer operation using the electromagnetic contactor or similar device installed on the primary side of the mold dryer. Do not stop the mold dryer using an electromagnetic contactor or similar device installed on the primary side. Surge voltages will damage the internal electronic
- Induced lightning surges caused by lightning strikes may damage the mold dryer, cause malfunctions, or lead to accidents such as fires. If the hot air generator is used in an area susceptible to lightning strikes, Be sure to implement lightning protection measures, such as installing a surge arrester.
- Always use commercial power with a sine wave (50/60 Hz) for the mold dryer's power supply. Never use power from frequency converters or other sources that produce distorted waveforms containing harmonics. Harmonics and noise may damage internal electronic components.

2. Installation

① Install in a horizontal position. Refer to the right photo for front-to-back tilt.

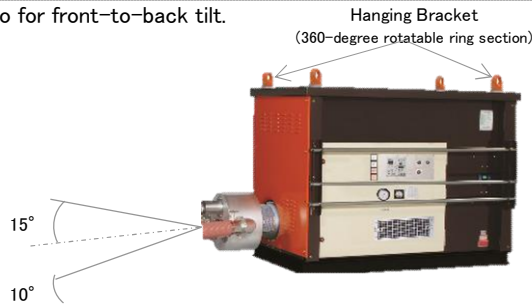
② When moving, use the lifting hooks.

③ Where installation is not possible

- Vibrating locations
- Outdoors exposed to wind and rain
- Near combustible materials
- Above heat-generating objects
- Locations with ambient temperatures outside the range of 0° C to +40° C
- Locations where the back side is in direct contact with walls, etc.
- Locations with ambient humidity of 85% R.H. or higher
- Sealed rooms and enclosures
- Locations with low atmospheric pressure
- Locations at altitudes of 1000m or higher
- Locations where acidic gases, corrosive gases, etc., are present
- Locations with electrically conductive suspended particles (e.g., carbon fibers)

Caution When moving the mold dryer using the suspension hardware (the ring section features a ball bearing structure for 360-degree rotation)

Always check the suspension hardware for abnormalities such as damage, deformation, scratches, wear, rust, or corrosion, and ensure all bolts and nuts are tight.



3. Piping

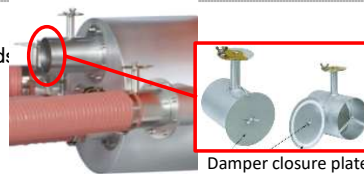
Securely fasten the piping to the outlet.

Install piping as thick as possible, as short as possible, and with gentle bends.

③ If you drag the tubing (hose) across the floor, it may tear, causing hot air to leak during mold drying. Please take great

④ Do not apply uneven load to the outlet while the mold dryer is fixed.

⑤ For any outlets on the multi-branch head that are not in use, close the dampers completely and securely install the included “damper closure plates” (4 included) to prevent hot air leakage. Eliminating hot air leakage helps conserve energy.



4-1. Power Supply

① Have a licensed electrician perform connection and grounding work.

② Connect the power cord according to: R (Red), S (White), T (Black), and Ground (Green).

◆ The terminals of the one-touch connector cable are single-pole connectors. The connector phase are:

[R phase = Red, S phase = White, T phase = Black], and each has a matching color socket.

Please prepare a power cable and wire it to the socket (included accessory) for use.

	Heater Current Value 200V	Blower Rated Current Value 200V	Socket-Compatible Crimp Terminals
X-5MS	173A	20A	R100-12



◇ Regarding One-Touch Connector Cable Wiring

- When wiring to the included socket, use proper crimp terminals and ensure secure connection with the correct tightening torque.
- Ensure the plug and socket are securely inserted and fixed without any looseness.
- Do not subject the plug's power receiving section to impact. This can cause deformation and result in poor contact.
- Prevent foreign objects such as dirt, dust, or sand from entering the plug and socket. This can cause poor contact.
- Never insert or remove the plug and socket while power is applied.
- When the plug and socket are disconnected, cover the socket with the cap (socket accessory) to protect it.

③ Be sure to use a commercial power source (50/60 Hz) with a sine waveform to power the hot air generator. Never use a power source that contains harmonics or has a distorted waveform. In addition, take sufficient measures to prevent surge voltages and noise from entering the power supply.

④ Install acircuit. An earth leakage circuit breaker (ELB) is standard equipment on the X-5MS.

⑤ To electric shock accidents, perform grounding work.

Caution Avoid excessively long wiring to prevent voltage drop.

Caution When the main breaker (ELB) of the hot air generator is turned OFF, power to the control circuit is also cut off. During wiring and inspection, always disconnect the power supply, including the factory main power source (primary power source). Working with the power on will result in electric shock.

Caution When installing outlets for connections, ensure sufficient capacity. Outlets may overheat or malfunction due to aging-related contact issues or phase loss. Avoid using outlets whenever possible.

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

4-2. Power Supply

◇When not using a one-touch connector cable

- • When not using a one-touch connector cable, use the power terminal block of this unit.
- The power terminal block is configured as [Top = Device Side (for internal power wiring of this unit)] [Bottom = Power Supply Side (for customer power wiring)]. Labels indicating [Device Side] and [Power Supply Side] are affixed to the side of the terminal block.
- When wiring to the factory main power source (primary side power), use the [Lower Side = Power Supply Side]. Please take care not to make a mistake.
- When wiring to the terminal block, ensure the existing power line is connected to the [lower side = power supply side] terminal block
- Remove and wire accordingly. Be sure to insulate the crimped terminals of the removed power wires.

★Be sure to secure the power cable. For the power terminal block
Never apply any load.

Power Terminal Block (M10)

Ground terminal block (lower side = customer wiring side)



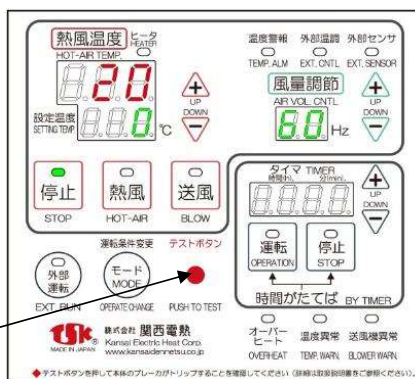
5. Maintenance and Inspection

Test Button

During overheating, the electromagnetic contactor (MC1) inside the main control panel to verify it turns OFF correctly. Press the test button for several seconds once a month while the unit is stopped (but energized). Press the test button for several seconds once a month to confirm the overheat lamp illuminates and the operation indicator (Page.6).

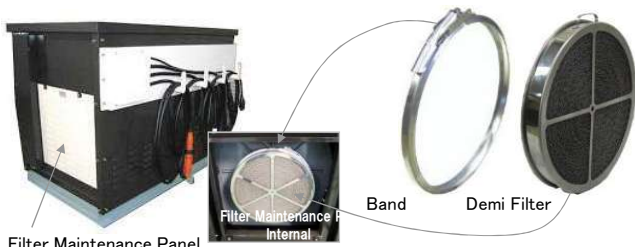
After confirmation, turn the main breaker (ELB) OFF and then ON again.

Test Button



Inspection of the Intake Filter and Control Panel Internal Filter

◆The mold dryer's intake is equipped with a demi-filter. Always inspect the intake demi-filter and clean it regularly. cleaning. If the filter becomes clogged, the heater case may reach abnormally high temperatures, causing overheating or temperature abnormalities.



◇When you remove the filter maintenance panel, you will find the demi-filter installed.

When performing maintenance (cleaning), remove the strap, take out the demi-filter, and rinse it with water.

Before reinstalling it, make sure it is completely dry.

*The demi filter can be washed and reused.

※By checking the airflow using the [Differential Pressure Gauge] and [Airflow Conversion Chart] on the control panel, you can confirm reduced airflow = filter clogging.

★The inspection method for the panel internal filter is described on page 5 [Names and Functions of Parts].

Self-Inspection

◆To ensure safer use of this unit, we recommend that you perform a self-inspection once it has been in use for more than 10 years.

[Self-Inspection Items]

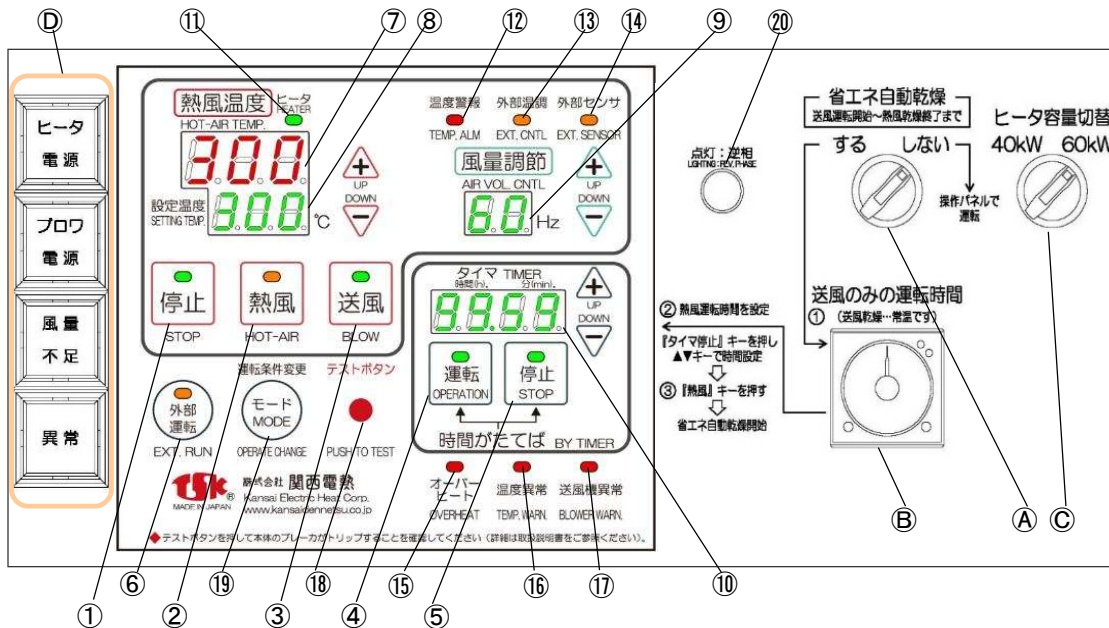
- Insulation Resistance Measurement
- Heater Current Value Measurement
- Inspection of Terminal Block Tightening
- Other visual inspections
- Inspection of electrical component operation and heat generation
- Inspection and cleaning for foreign object ingress inside the main unit and suction inlet
- Inspection and cleaning for foreign object ingress inside the control panel

For self-inspection, please request assistance from your nearest electrical contractor.

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 Parts

Operation Panel (X-5MS)



① Stop switch

Used to stop fan operation and hot air operation and to cancel timer operation.

② Hot Air Switch

Pressing the switch starts hot air operation.

③ Fan Switch

Pressing the switch starts fan operation.

④ Timer Operation Switch

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

⑤ Timer Stop Switch

Press the switch to set the time for operation to stop after a certain period. After setting, press the hot air switch.

⑥ External Operation Switch

※Not used with X-5MS.

⑦ Indicator PV

Displays the outlet temperature.

⑧ Setpoint SV

Displays the set temperature for the outlet temperature.

⑨ Airflow Adjustment Display

Displays the setting value for airflow adjustment (inverter frequency setting).

⑩ Timer Setting Display

Displays the timer setting time. Counts down by time increment.

⑪ Heater Lamp

The heater control operation status is indicated by lighting and flashing.

⑫ Temperature alarm lamp

※Not used with X-5MS.

⑬ External Temperature Control Lamp

※Not used with X-5MS.

⑭ External Sensor Lamp

※Not used with X-5MS.

⑮ Overheat Indicator

Lights up when the interior of the heater case reaches an abnormally high temperature, and the electromagnetic contactor (MC1) inside the control panel will turn OFF.

⑯ Temperature Abnormal Indicator

This indicator lights up when the outlet hot air temperature becomes high and exceeds the upper limit, and the electromagnetic contactor (MC1) inside the control panel turns OFF.

⑰ Blower Abnormal Lamp

Lights up when the blower is overloaded, stopping operation.

⑱ Test Button

Pressing the button turns OFF the electromagnetic contactor (MC1) inside the control panel will turn OFF.

⑲ Mode Switch

⑧ When changing the setting SV display to the heater output display, use this to return to the hot air temperature setting display.

⑳ Reverse Phase Lamp

It illuminates when the power supply is reversed or missing a phase, or when MCB-B is OFF.

A Energy-saving auto-dry switch

Select between Normal Operation or Energy-Saving Auto Drying. Press and hold the hot air switch during hot air operation.

B Fan-only operation timer

You can set the fan-only operation time during energy-saving auto drying.

C Heater Capacity Switch

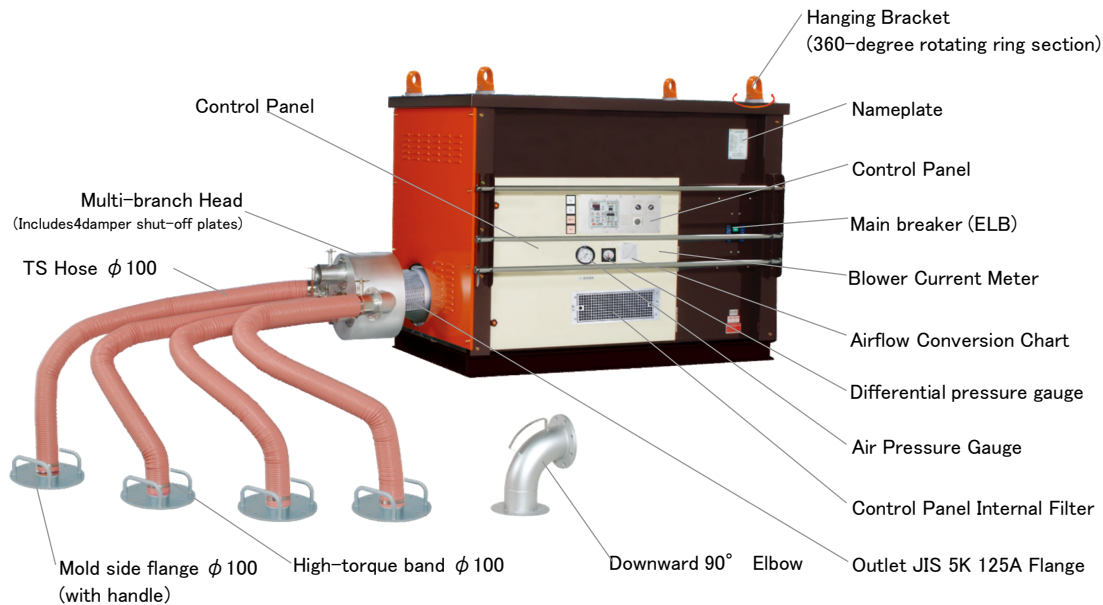
Allows switching the heater capacity during hot air operation.

D Various Indicator Lamps

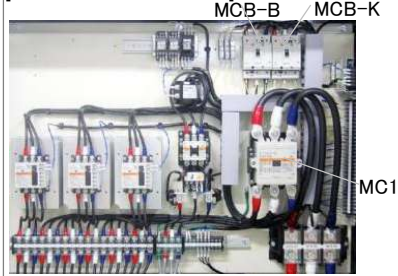
Illuminates during power supply and during various abnormalities.

6. Names and Functions of PartsContinued onPage 4

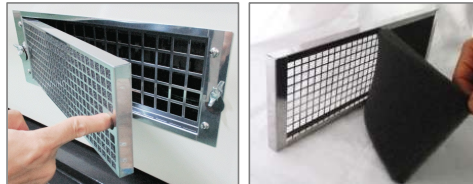
MODEL: X-5MS



[Inside the Control Panel]



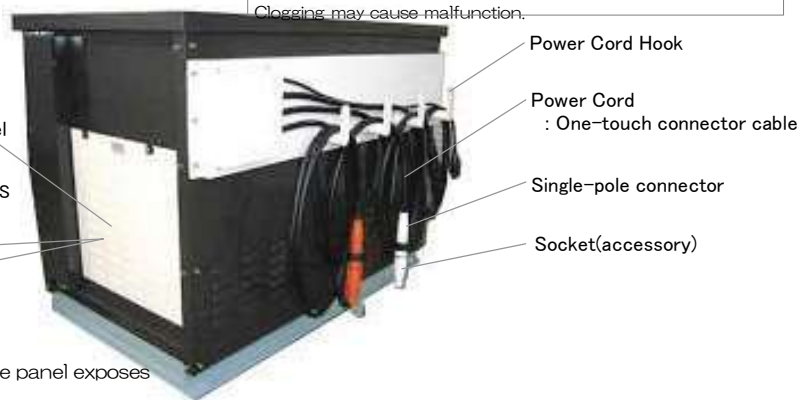
[Control Panel Internal Filter] Insp.



Loosen the two wing screws on the front of the control panel to remove the internal filter. Please clean the filter (polyester material) regularly. Clogging may cause temperature rise inside the control panel and allow molten sand to enter the interior. Clogging may cause malfunction.

Filter maintenance panel

Demister Filter
: Demister Cartridge F-81S



*Removing the filter maintenance panel exposes Demi filter included.

◇When placing this unit on top of a mold and drying by injecting hot air directly from the mold's main sprue, use a downward-facing 90° elbow.
For the downward 90° elbow, remove the multi-branch head and attach it directly to the JIS 5K125A flange section of the outlet.

◇When drying multiple molds with a single unit, attach the multi-branch head directly to the JIS 5K125A flange outlet.

◇When moving the mold dryer using the lifting hardware (the ring section features a 360-degree rotating ball-bearing mechanism), be sure to check the lifting hardware for any abnormalities—such as damage, deformation, scratches, wear, rust, or corrosion—and ensure that all bolts and nuts are tight.

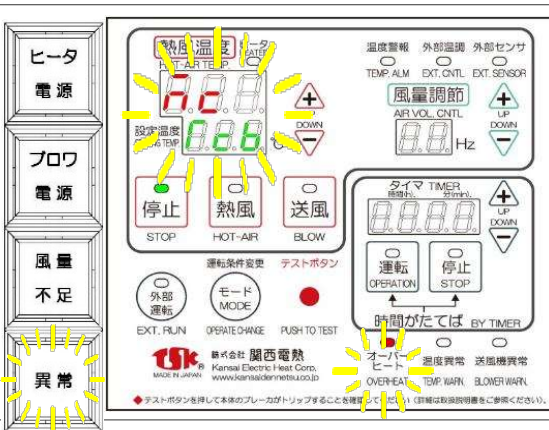
7. Anomaly Detection

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

7-1 Overheat

◆If the heater case reaches an abnormally high temperature, it is detected as overheating. The electromagnetic contactor (MC1) inside the control panel turns OFF, stopping all operations.

- During Overheating



The overheat lamp (red) will illuminate, and "MC" will flash on the set point display, TCB will flash on the set temperature display. Additionally, the will also illuminate.

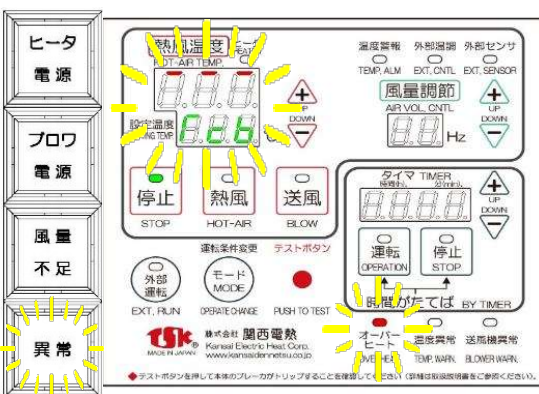
《Primary Causes》

- Clogging of the intake demi-filter
- Fan motor lockup due to foreign object intrusion
- The mold sprue for exhausting hot air from the mold is not secured.
- The mold sprue for introducing hot air is too small. (Significant pressure loss)
- The airflow/pressure adjustment damper is closed.
- The dampers on each head of the multi-branch head are closed.

《Reset Method》

After removing the cause of overheating and allowing sufficient cooling, turn the main breaker (ELB) OFF once, then turn ON again.

- Overheat Sensor Burnout Condition



The overheat lamp (red) flashes, and the hot air temperature display shows '—' will flash in the hot air temperature section, and 'Tcb' will flash in the set temperature section.

《Primary Causes》

- Overheat sensor wire break
- Overheat sensor wiring break
- Overheat sensor wiring connector disconnection

《Reset Method》

Turn off the primary power supply and request repairs.

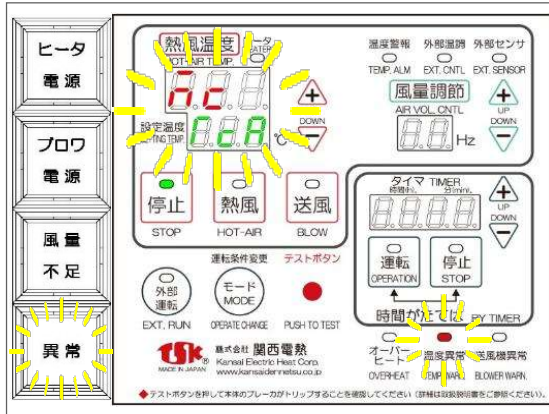
Caution: Always disconnect the main power supply (factory power) before checking wiring or making adjustments during an abnormality.

7. Anomaly Detection

7-2 Temperature Abnormality

- ◆ The hot air generator will stop operating if the outlet temperature exceeds the upper limit. Operation will also stop if the outlet sensor is disconnected or burned out, or if an abnormal temperature is detected inside the mold dryer.

●When the outlet temperature exceeds the upper limit



The temperature abnormality lamp (red) illuminates, MC flashes on the PV display, TCA flashes in the set SV section, and the electromagnetic contactor (MC1) turns OFF, stopping all operations. Additionally, the abnormal lamp (yellow) on the control panel will illuminate.

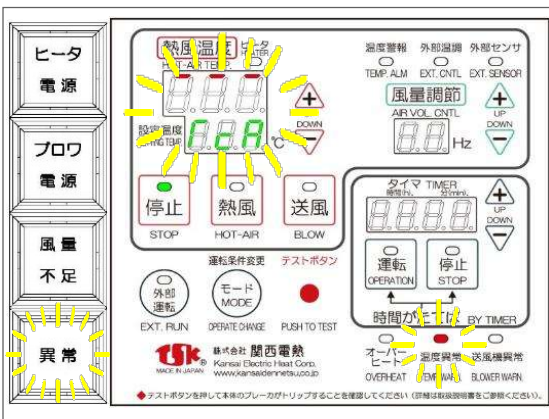
《Primary Causes》

- Discharge outlet temperature exceeds upper limit
- Reduced airflow due to excessive pressure loss
- Reduced airflow due to clogged inlet demi-filter

《Reset Method》

Eliminate the cause of the outlet temperature exceeding the upper limit, allow sufficient cooling, turn the main breaker (ELB) OFF and then turn it back ON.

●When the outlet sensor burns out



Temperature abnormality lamp (red) flashing, ^{display PV} section showing ---, setting TCA flashes in the SV section, the main breaker (ELB) trips, causing all operations to stop., the abnormal lamp (yellow) on the control panel will illuminate.

《Primary Causes》

- Outlet sensor wire breakage
- Outlet sensor wiring break
- Disconnection of outlet sensor wiring

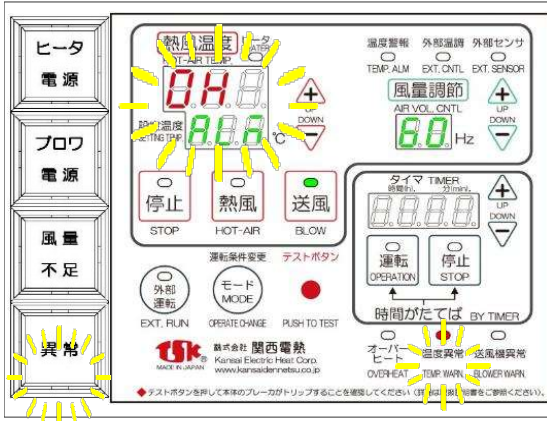
《Reset Method》

Turn off the primary power supply and request repairs.

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

7. Abnormal Detection

● Hot Air Generator Internal Temperature Abnormal



The temperature abnormality lamp (red) flashes, OH appears on the display PV section, and the ALM indicator flashes on the SV section. ALM flashes on the SV display, and the unit enters fan operation mode.

Additionally, the abnormal lamp (yellow) on the control panel will illuminate.

《Primary Causes》

- High ambient temperature at mold dryer installation site.
- Hot air leaking from the outlet flows back into the control panel
- Impact of furnace body heat dissipation temperature when installed above the furnace body
- Temperature rise inside the control panel due to clogging of the control panel filter

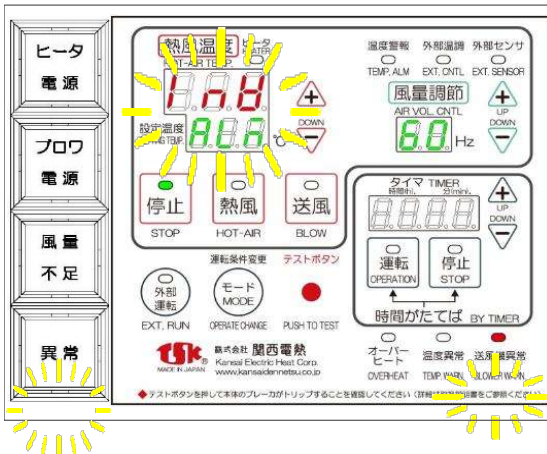
《Reset Method》

Stop operation using the stop switch and allow the internal temperature of the mold dryer to decrease, and then turn the main unit's breaker (ELB) OFF to reset.

7-3 Blower Abnormal

◆When the blower experiences overload, overcurrent, or lockup, all operations of the mold dryer will stop.

●When the blower malfunctions



The blower fault indicator (red) lights up, and “INV” flashes in the setpoint (PV) display, while “ALM” flashes in the reference (SV) display. In addition, the fault indicator (yellow) on the control panel lights up.

《Primary Causes》

- Bearing wear
- Abnormal voltage (voltage outside rated range)
- Piping with high pressure loss
- Avoid using in locations with extremely narrow pipe openings
- The mold sprue for hot air injection or exhaust is too small.
- The airflow/pressure adjustment damper is closed.
- The dampers on each head of the multi-branch head are closed.
- Clogging of the intake demi-filter

《Reset Method》

• After pressing the stop switch, turn the main circuit breaker (ELB) off, then turn it back on after the cause of the problem has been resolved.

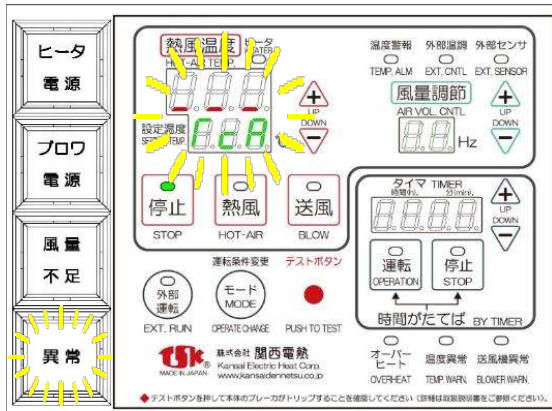
Caution: Always disconnect the main power supply (factory power) before checking wiring or making adjustments during an abnormality.

7. Abnormal Detection

7-4 Other Abnormalities

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

◆ If any temperature sensor is reverse-connected or detects temperatures below -15°C (-9°F) (internal sensor only: -5°C / -40°F), the mold dryer will stop.



The display for each sensor will flash on the指示PV section (—) and the設定SV section.

Discharge port sensor	TcA
Overheat Prevention Sensor B1	Tcb
Overheat Prevention Sensor B2	Tcb.
Intake Sensor	Tcc
Internal Temperature Sensor	TcM

《Primary Causes》

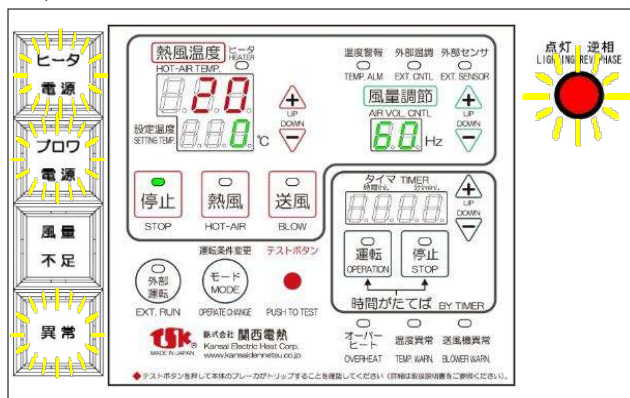
- Reverse connection due to sensor wiring adjustments
- Atmosphere and intake temperature below freezing

《Reset Method》

Turn off the primary power supply and request repairs.

● Inverse phase abnormality

◆ If the power cord connections are reversed or a phase is missing, the hot air generator will become inoperable.



During reverse phase or when phase T is missing, press the main breaker (ELB)

The display content will be the same as when ON. Also, during reverse phase and the fault lamp will illuminate.

- If R or S phase is missing, the

All displays will turn off, and the reverse phase lamp will also turn off.

《Reset Procedure》

- When reverse phase occurs

...Turn off the power once and disconnect either of the power connection wires swap two of them.

- Phase loss

...If the above symptoms persist even after performing reverse phase countermeasures and turning the power ON does not improve, a phase loss may be present.

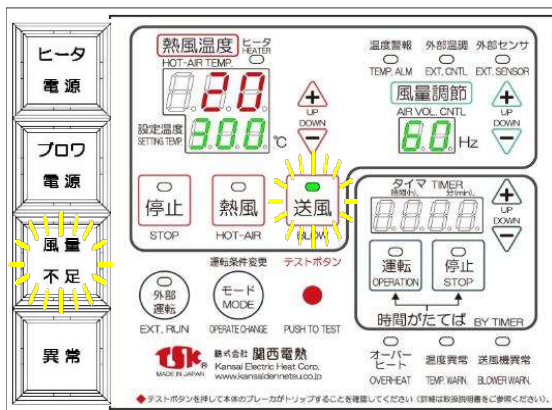
Turn off the power once and check the main power terminals and one-touch connector cable terminals, connectors, sockets, power lines Please verify this.

※ If the 'Blower Power Supply Lamp' is off during reverse phase or T-phase loss, the TCB-B inside the control panel may be OFF.

Turn the TCB-B OFF and then ON again to restart operation. If the same symptom occurs again after restarting operation, turn OFF the primary power supply. Please request repairs.

● Insufficient Airflow

◆ If airflow is extremely low, only fan operation is possible; hot air operation cannot be performed. Furthermore, if airflow becomes extremely low during hot air operation, the heater will turn OFF and switch to fan operation.



• The airflow insufficient lamp on the control panel will illuminate. If in hot air operation, the heater lamp will turn off.

《Primary Causes》

- Bearing wear
- Clogging of the intake demi-filter
- The airflow/pressure adjustment damper is closed.
- The dampers on each head of the multi-branch head are closed.
- The mold sprue for hot air injection or exhaust is too small.

- Avoid using in locations with extremely narrow pipe openings

《Reset Method》

- After pressing the stop switch, reset the main breaker (ELB).

Turn OFF, remove the cause, then turn ON again

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

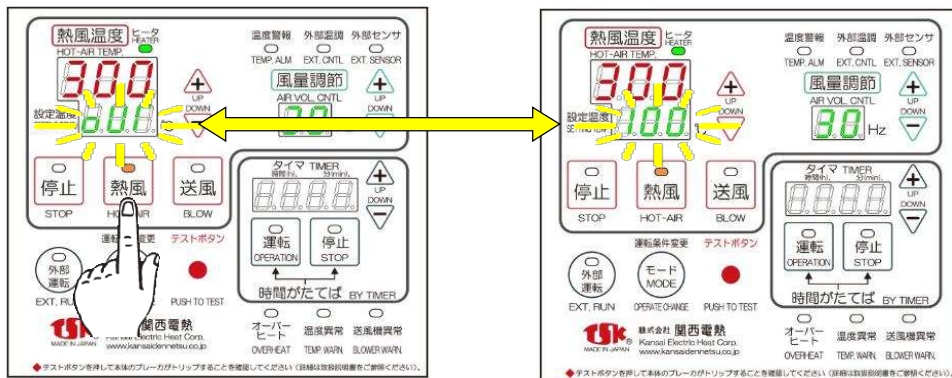
8. Other Functions

8-1 Heater Output Display

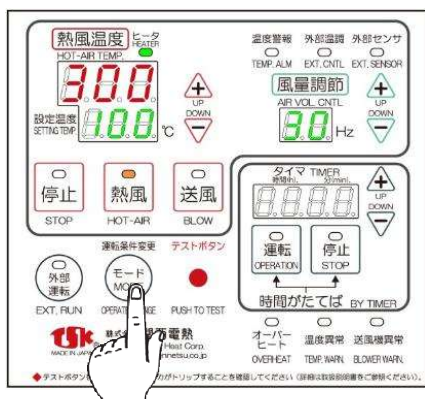
◆ You can display and confirm the current heater output during hot air operation. Use this for data collection on heat consumption, etc.

- ① Press and hold the hot air switch during hot air operation. (Approximately 5 seconds)

The SV setting section will alternately display 'OUT' and 'Current Heater Output (%)'.



- ② key once.



Manufacturer
Distributor



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