

Please ensure this instruction manual is delivered to the e

For your records

SH81-05

Instruction Manual

● Be sure to read before use.

- ◆ Thank you for purchasing the SH81-05 Hot Air Generator Heater.
- ◆ Verify that the model number, part number, and voltage on the unit's nameplate match the ordered product.

The contents of this instruction manual are subject to change without notice.
Furthermore, the illustrations and markings in this manual do not guarantee the actual specifications.
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Kansai Electric Heat Co., Ltd.

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

To ensure trouble-free operation of the SH81-05

◆ This section lists important precautions that have caused failures in the past. We kindly request you to verify these against your company's usage methods to ensure safe operation of the SH81-05.

● If the SH81-05 is used without airflow, the heater will break. Also, when performing trial operation (powering on), ensure the safety circuit is secured before proceeding.

● The SH81-05 uses a [K] thermocouple as its overheat prevention sensor. Ensure this is verified when establishing the safety circuit.

● Operating or conducting test runs without completing the safety circuit wiring may lead to serious accidents.

● Always install a filter on the inlet side of the blower for the SH81-05. Also, clogging of the filter may cause abnormal overheating inside the heater, potentially preventing operation. Therefore, always keep the filter clean.

● If the environment where the SH81-05 heater is installed contains conductive airborne particles such as dust, fine particles, or carbon fibers, as well as oil, oil fumes, oil mist, moisture, or water vapor, these substances may adhere to or enter the heater, leading to heater failure.

● Use with extreme caution in environments containing combustible gases, flammable gases, plating, or corrosive atmospheres. Consult our company beforehand.

● The SH81-05 is a high-temperature hot air generator heater. Ensure adequate insulation is applied to all piping connected to the outlet or inlet. Failure to provide sufficient insulation will cause significant reduction in hot air temperature due to heat loss through the piping. Exercise extreme caution when connecting piping to the outlet or inlet.

● Do not run sensor or input signal wiring adjacent to or bundle it with AC power lines, power lines, or harmonic lines. Noise may cause malfunctions or damage to internal electronic components.

● During initial operation of the SH81-05, smoke and unpleasant odors may be emitted from the insulation material binder. However, this does not affect normal operation.

2. Installation

- ① Secure the unit firmly on a level surface.
Ensure sufficient maintenance space is available during installation.
Refer to the delivery outline drawing for details.
- ② Operate within an ambient temperature range of -10°C to $+60^{\circ}\text{C}$ and an ambient humidity of 85% R.H. or less (non-condensing).
- ③ Install and use the unit in a location not exposed to direct sunlight, rain, or wind, indoors, in a well-ventilated area that is easy to maintain.
- ④ Do not place combustible materials in the vicinity. If installing in an area with high levels of oil mist, dust, debris, or lint, install a filter and clean it regularly. A clogged filter not only reduces efficiency but can also cause the SH81-05 to malfunction. Operating without a filter under the above conditions allows dust and debris to accumulate inside the SH81-05 heater, causing overheating. This can result in flames escaping from the hot air outlet, posing a significant hazard.
※ Be aware that conductive materials like carbon fibers adhering inside the SH81-10 may cause electrical leakage.
- ⑤ Take measures to prevent external vibrations from directly transmitting to the SH81-05.
- ⑥ Grounding work must be performed. To prevent electric shock and equipment failure, do not supply power until wiring work is complete.
- ⑦ If power is supplied to the heater without airflow, the heater will burn out due to dry heating. Therefore, always incorporate an interlock circuit with the airflow device.
- ⑧ Ensure that the pressure applied to the SH81-05 does not exceed the pressure indicated on the nameplate (0.2 MPa).
- ⑨ Places where installation is not possible

<ul style="list-style-type: none"> •Locations subject to vibration •Above heat-generating objects •Locations where metal fragments or similar objects may fall •Locations with low atmospheric pressure •Locations with conductive floating particles (e.g., carbon fibers) 	<ul style="list-style-type: none"> •Outdoors where exposed to wind and rain •Locations outside the ambient temperature range of -10°C to $+60^{\circ}\text{C}$ •Sealed rooms and enclosures •Locations with floating acidic gases, corrosive gases, etc. 	<ul style="list-style-type: none"> •Near combustible materials •Locations with ambient humidity of 85% R.H. or higher •Locations at altitudes of 1000 meters or higher •Locations with high levels of dust, powder, etc.
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3. Power Supply

- ① Have a licensed electrician perform power connection and grounding work.
- ② Install a dedicated circuit. When installing a ground fault circuit interrupter (GFCI), determine the sensitivity current rating according to the table below.
- ③ Connect the SH81-05 power terminals to the control panel using appropriate wiring.
Never use a power source with distorted waves containing harmonics for the control panel power supply.
Also, take sufficient measures to prevent surge voltages and noise from entering the power supply.
- ④ Be aware that excessively long wiring can cause voltage drop. Also, when installing outlets for connections, ensure sufficient capacity. Avoid using outlets whenever possible, as they may overheat or fail due to contact issues from aging, phase loss, etc.
- ⑤ To prevent electric shock accidents, perform grounding work. (For 300V or less: Type D grounding)

Caution Always disconnect the power supply before wiring or inspection. Working with the power on may cause electric shock.

Model	Earth Leakage Circuit Breaker (ELB) Sensitivity Current Guidelines
SH81-05	Approximately 100 mA

* The sensitivity current of a ground fault circuit interrupter (GFCI) is typically about 10 times the initial leakage current.

4. Piping

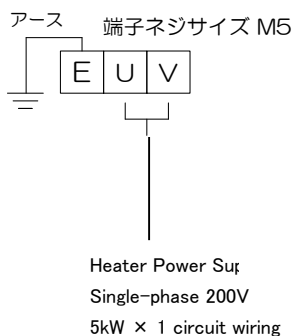
- ① Securely fasten piping to the outlet and inlet.
Use piping such as gas pipes or flexible tubes that can withstand the air pressure and have sufficient heat resistance at the hot air outlet. Ensure all pipe connections are secure to prevent air leaks.
- ② Install piping as large in diameter, as short, and with as gentle bends as possible, and ensure adequate insulation is applied.
If piping is long, pressure loss occurs due to factors like the friction coefficient inside the pipe, pipe diameter, and pipe bends. This reduces airflow volume, causing the heater to overheat abnormally. Therefore, select an air supply source that sufficiently accounts for piping pressure loss.
- ③ Pipe connections to the outlet and inlet must be made to accommodate thermal expansion of both the main unit and the connecting pipes. If the outlet and inlet flange piping is fixed, thermal expansion will cause excessive force, leading to hot air leakage or damage.
- ④ Residual cutting chips, etc., from piping installation entering the interior through the hot air outlet or air supply port can cause a short circuit inside the heater, posing a significant hazard. During piping installation, take great care to ensure no cutting chips, etc., remain inside the piping.
- ⑤ Pipe connections to the outlet and inlet should be made to prevent excessive loads.
- ⑥ The load capacity W [kgf] of the outlet and inlet flanges must be $1/8$ or less of the main unit mass.
Example: For a unit mass of 400 kg, the load capacity should be approximately 50 kgf or less.
- ⑦ The bending moment M [kgf·m] on the outlet and inlet flanges should be $1/8$ or less of the unit's mass.
Example: For a unit mass of 400 kg, the load capacity should be approximately 50 kgf or less.
- ⑧ Pipe connections to the outlet and inlet flanges must be made using piping connections capable of absorbing thermal expansion of both the main unit and the connecting pipes.
If the outlet and inlet piping is fixed, excessive force due to thermal expansion may cause hot air leakage or damage.

5. Terminal Description

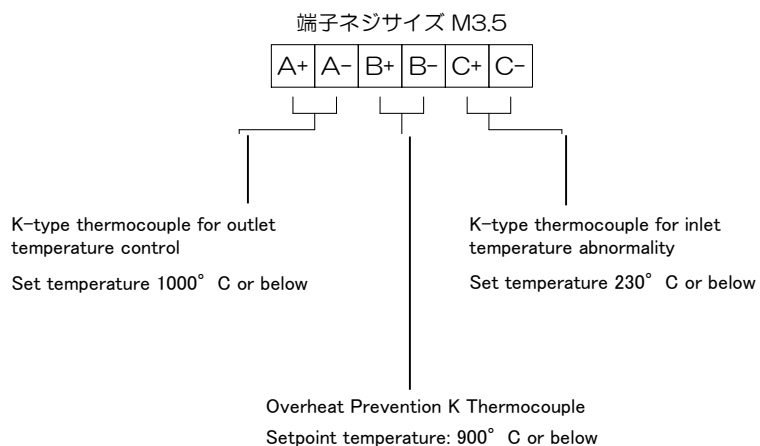
SH81-05 (1200-5)

Heater Current Value (at 200V) Three-phase 5kW 25A

Heater terminal block



Sensor terminal block

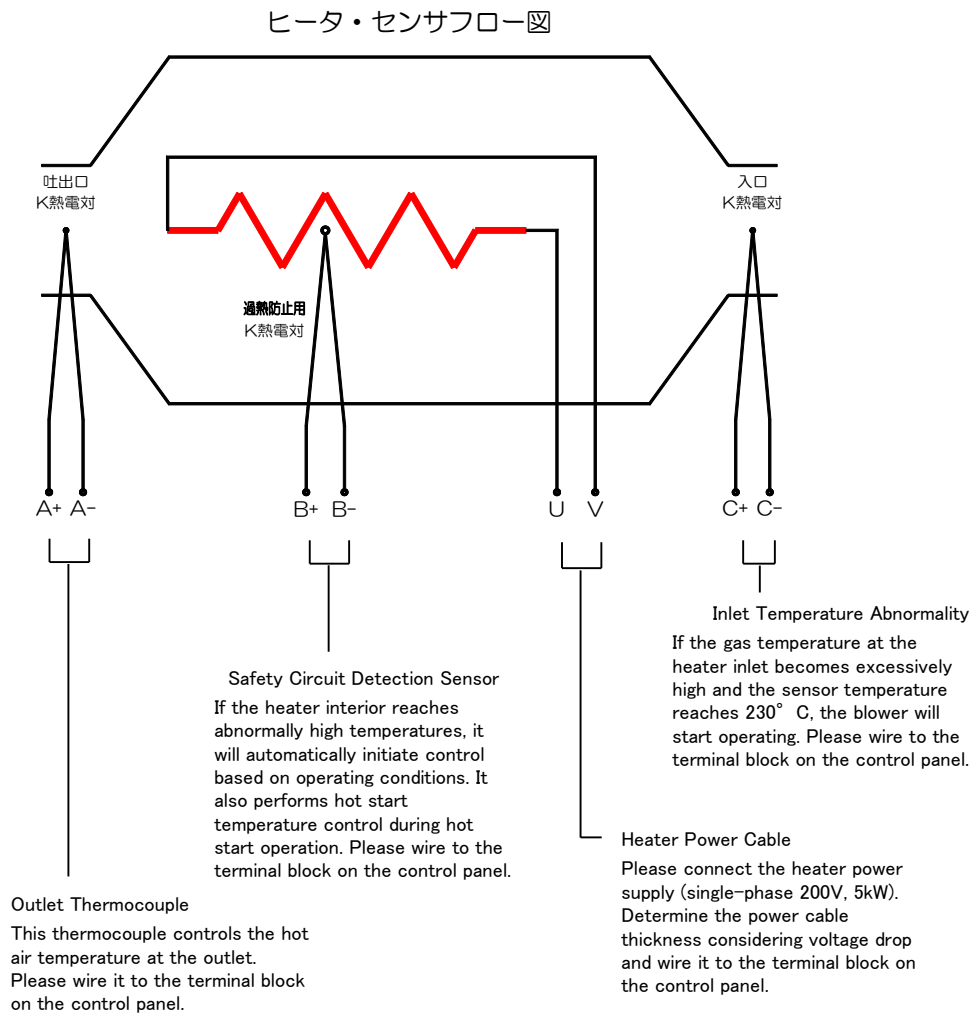


6. Sensor Descriptions

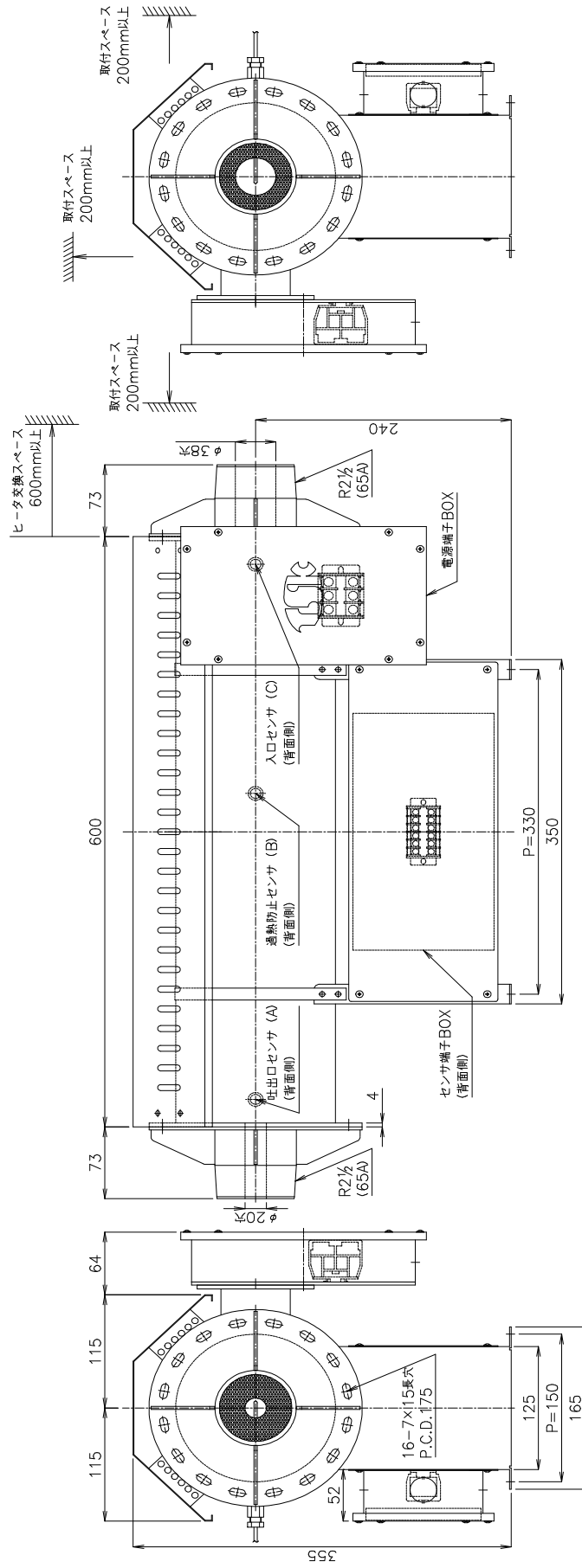
- ① The SH81-05 incorporates three K-type thermocouples internally: **Sensor A** for hot air detection, **Sensor B** for overheat prevention temperature detection and hot start, and **Sensor C** for inlet temperature detection. Temperature control using these sensors allows constant monitoring of the heating element (heater) surface temperature, achieving high thermal efficiency and extended lifespan. **It is essential to configure the circuit for temperature control using all three sensors.**

Using the dedicated automatic temperature controller TCU12KH1000 enables operation of the SH81-05 at the maximum hot air temperature (1000° C) and also allows hot start operation. Furthermore, it enables perfect temperature management via each sensor, allowing control that fully utilizes the SH81-05's performance.

<Sensor Locations>



7. Outline Drawing



8. Maintenance Inspection

- Periodically inspect the tightness of screws on terminals and other parts.
- Always inspect and clean the mesh and filter at the blower inlet to prevent clogging.
- Operating with clogged wire mesh or filters can cause the heater to overheat abnormally, posing a significant risk.
- When performing maintenance and inspections, always disconnect the power supply to prevent electric.
- To ensure safer operation of this unit, voluntary inspections when the usage period exceeds 10 years.

Perform.

[Self-Inspection Items]

- Measurement of insulation resistance values
- Measurement of heater current values
- Tightening inspection of all terminal blocks
- Check for foreign objects and clean the heater terminal block and inside the control panel
- Check for foreign objects inside the unit and at the inlet; clean if necessary
- Check operation and heat generation of electrical components
- Other Visual Inspections

For self-inspection, please contact your nearest licensed electrician.

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



Hot Air Generator
Manufacturer
Distributor



Head Office Zip code:577-8566, 5-4-18 Takaida Nishi, Higashi-Osaka City, Osaka
TEL (06) 6785-6001 FAX (06) 6785-6002

Tokyo Branch Zip code:144-0035 2-4-4 Minamikamata, Ota-ku, Tokyo 144-0035
TEL (03) 5710-2001 FAX (03) 5710-2005

Website www.kansaidennetsu.co.jp

Kansai Electric Heat Co., Ltd.