This instruction manual must be delivered to the end user.

Storage

October 2017, 4th Edition,

SHP40/50

This manual cannot be reissued. Please keep it in a safe place.

The tools shown are for illustrative purposes only and are not our products.
It is intended as a size reference.
This has absolutely nothing to do with our products.

Introduction

●Thank you very much for purchasing the SHP Series electric heater for generating high-temperature hot air.

●This manual explains the necessary items for the correct and safe handling of the SHP series.

●To fully utilize the performance of the SHP series, prevent accidents, and ensure long-term reliable operation,

●It is essential to handle the unit with care at every stage, from receipt to actual operation, not just during maintenance inspections after startup.

●Regarding the scope of our responsibility, we are not liable for any damage or loss arising

●Before performing any work involving transportation, installation, piping, wiring, operation, maintenance, inspection, repair, or disassembly of the SHP series,

●Please thoroughly familiarize yourself with this manual before performing any of these tasks to ensure correct and safe handling.

●For safety reasons, do not modify the SHP series. We assume no responsibility for accidents caused by modifications.

●Therefore, we cannot be held responsible for any issues arising from improper handling.

● Ensure this manual is delivered to the personnel responsible for handling the unit.

● Keep this manual in a safe place so you can refer to it whenever needed.

●This manual and the SHP series may be revised or improved without prior notice.

● If you have any questions, please contact our company.

This manual uses the following symbols to ensure safe handling of the SHP series.

⚠ Danger If handled incorrectly, dangerous situations may occurdeath ormay occur.

⚠ Caution Incorrect handling may create hazardous situations, potentially causing moderate. When minorinjury is possible, or when only property damage.

Please note that even items listed under ″Minor Injury″ may lead to serious consequences depending on the situation.
All items listed are important: be sure to follow them.

⚠ Danger	
General	●Transportation, installation, piping, wiring, operation, maintenance, inspection, repair, and disassembly, must be performed by specialists thoroughly familiar with the SHP series. ●Do not use the SHP series in explosive atmospheres. There is a risk of injury, electric shock, orfire. ●For transport, installation, piping, wiring, operation, maintenance, inspection, repair, and disassembly work, Always perform these tasks with theturned off.Failure to do so may result ininjury, electric shock, fire. ● Do not touch the heating element when power is applied to the risk of electric shock.
Installation Piping Wiring	● Do not install the SHP series in unstable locations, to risk of injury. Be sure to connect the wire to the risk of electric shock. ● Do not forcefully bend, pull or pinch the wiring to the risk of electricshock, fire. ●Terminal covers removed from the SHP series for piping or wiring work must be ●Be reinstalled in their original positions. Failure to do so may result in electric shock.
Operation Operation	●Ensure the hot airdoes not hit the human body to the risk of burns. ●Stop operation immediately during a power outage to the risk of injury. ●Do not touch the main unit or piping during operation as they become extremely hot. ● If an abnormality occurs, stop operation immediately.
Maintenance	●Perform maintenance and inspection work only after the main unit and piping have cooled sufficiently.

⚠ Caution	
General	●Verify that the delivered item matches your order. Do not use it if it is incorrect. ●Do not use the SHP series outside the specifications listed in the instruction manual. ●Do not use damaged SHP series . ●Do not insert foreign objects or fingers into openings or gaps in the SHP series. ●Do not apply heavy loads to the SHP series.
Transportation	●Exercise extreme caution during transport to prevent dropping.
Installation	●Do not place flammable materials near the SHP Series. ● Keep the nameplate legible at all times. Do not remove it.
Piping	● Ensure pipe connections for the SHP series are installed securely to prevent loosening or leaks.
Wiring	●Verify that the rated voltage of the SHP series matches the nominal voltage of the input power source. ● Wiring work must be performed by qualified personnel in accordance with the Electrical Equipment Technical Standards and internal wiring regulations.
Operation	●Before operation, confirm safety and implement safety measures to prevent exposure to danger for personnel not handling the equipment.
Maintenance Inspection	●Do not touch the terminals when measuring the insulation resistance of the SHP series. ●Always reinstall any parts removed for maintenance or inspection work in their original positions.
Disposal	●When disposing of the SHP series, treat it as general industrial waste.
Other	●Depending on the equipment into which the SHP series is incorporated, it must comply with the provisions of the Industrial Safety and Health Act and local fire prevention ordinances.

1. Pre-Use Checks

1-1 Inspection of Actual

Please confirm that the following items are present. Also, please verify that there are no abnormalities.

● Main unit (1 unit) ● Instruction manual (this document)
● Tip support bracket (1 piece)
●Fixed-use screws (2 sets)
… Set screws M6×15 (SW, flat head) ×2
…Loose spacers (ID φ6 × OD φ9, 3.2t) × 2

2. Installation

●Use at ambient temperatures between -10° C and +60° C (do not allow freezing).

●Do not install the heater body in locations subject to vibration. Internal insulators and sensors may be damaged.

●The exterior of the heater becomes hot. Keep flammable materials away.

●Do not install in the following locations:
◇Outdoors where it will be exposed to wind and rain ◇Near flammable materials
◇Locations with high levels of dust or particulate matter
◇Areas with airborne conductive substances (e.g., carbon fibers)
◇Areas where acidic gases, corrosive gases, etc., are present

●Installation is acceptable if the unit is level; otherwise, restrictions apply to hot air temperature,

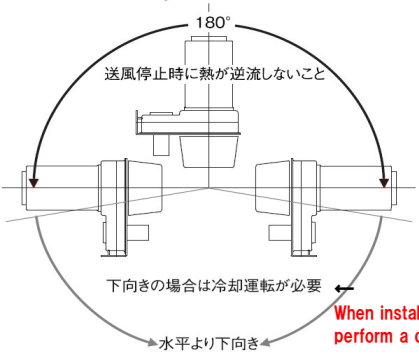
airflow, and operating methods. Regardless of the mounting orientation,

Ensure no heat backflow occurs during fan stop or hot start operation.

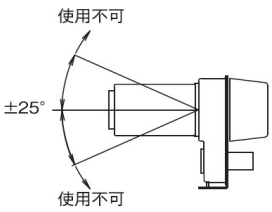
If heat flows back, the heater terminals may become extremely hot, potentially damaging connected wiring or hoses piped to the air supply port, may be damaged, until the hot air temperature at Sensor Position A reaches 70° C or below.

【Normal Operation】

《Hot air temperature: Below 500° C》
Installation possible at 360° C



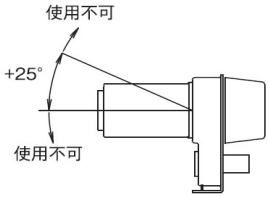
《When hot air temperature exceeds 500° C》
Installation is only possible within ±25° horizontal.



When installing below the horizontal position,
perform a cooling operation after hot air operation.

[For hot start operation... Automatic Temperature Controller TRC501 is

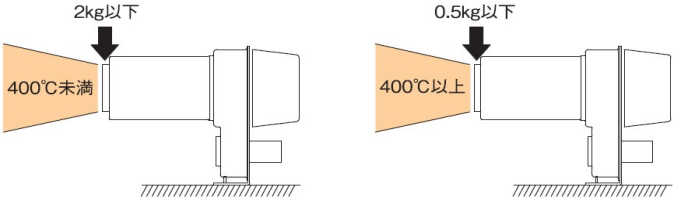
Installation is only possible within horizontal +25°



★When the installation orientation is within 《±25° from horizontal. Minimum usable air volume varies depending on whether the installation angle is within or outside the range of ±25° from horizontal. Airflow varies. Please refer to page 1 of the separate sheet for Catalog No 6.

Heat outlet load capacity

*When an optional dedicated adapter is not installed on the heater outlet.



●During hot air operation, applying load to the outlet may cause deformation due to high temperatures, potentially leading to malfunctions. Refer to the diagram above for installation and piping.

Note) Do not secure the unit solely by the outlet section of this unit. Damage may occur.
Note) Do not apply load to the tip support bracket of the accessory.

Precautions for Securing the Main Unit

◆Heater case length changes due to thermal expansion during hot air operation and thermal contraction during cooling after shutdown.
Extends and retracts front-to-back.

●If the mounting method lacks flexibility, the unit may be damaged. Use the stand provided for mounting the unit.
When mounting, use the included ″mounting screws″ to allow for thermal expansion and contraction of the heater case.

3. Wiring

●The SHP series heater incorporates two thermocouples [K] (A sensor for outlet hot air temperature detection and B sensor for hot start/overheat prevention Temperature Detection) are built into the heater. A and with the automatic temperature controller TRC501, the heater can be used without melting the fuse under all conditions.

●Piping materials must be gas pipes, tubes, etc., capable of withstanding air pressure, and the hot air outlet must be made of materials

Using the automatic temperature controller TRC501 enables control performance to its fullest potential.

Note) Do not use the SHP series without securing the B sensor as a protective circuit. Not only does this fail to prevent heater wire breakage, but it may also lead to serious accidents.

Note: When not using the automatic temperature controller TRC501, the operating temperature range of the SHP series will be lower.

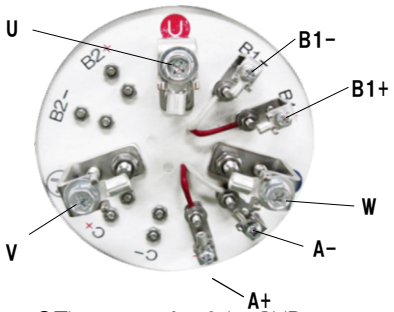
Also, note that the minimum usable airflow will differ.

**For details, refer to the 1-page supplement in Catalog No. 6.*

	using the TRC501	not using the TRC501
Outlet Hot Air Temperature (A Sensor)	**Maximum 800℃**	**Maximum 500℃**
Hot Start Temperature (B Sensor)	**Maximum 300℃**	**Not usable**
Overheat Prevention Temperature (B Sensor)	**700℃**	**400℃**

Note: Regarding the detected temperatures of each temperature sensor. There is a measurement (spatial) distance between the heating element (heater) and each temperature sensor. Even for the same product, the detected temperature may differ depending on the airflow rate. Due to factors such as pressure, temperature differences may occur in the detected temperatures of each temperature sensor.

3-1 Terminal



Terminal No.	Terminal Name
U	Heater Terminal (U)
V	Heater Terminal (V)
W	Heater Terminal (W)
A+·A-	A Sensor Terminal (K)
B1+·B1-	B Sensor Terminal (K)

●The terminals of the SHP series are designed to prevent rotation of the wiring side terminal when tightening the screw during wiring.
Therefore, please use the crimp terminals listed below.

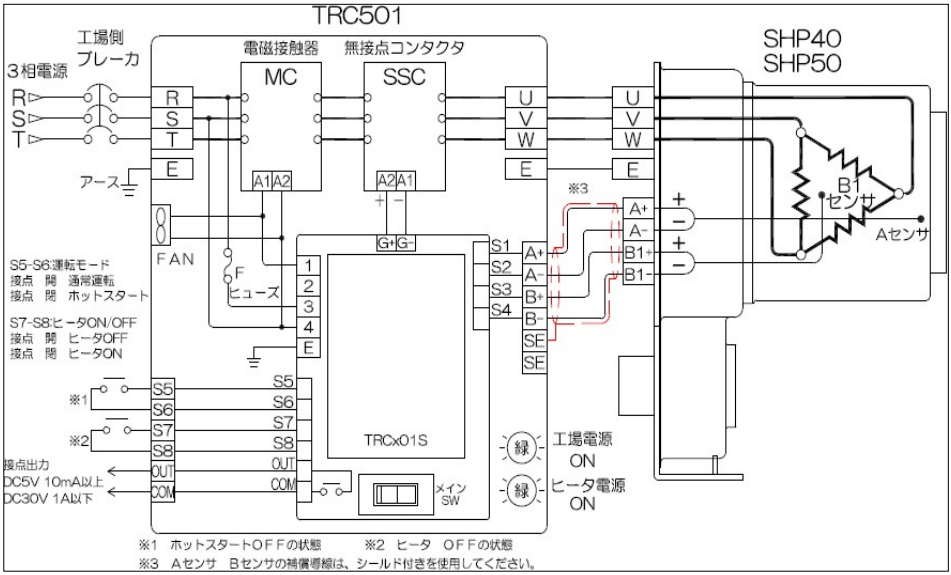
	SHP40, SHP40F	SHP50, SHP50F
Heater terminals (U, V, W)	Round Terminal R3.5-5	Round Terminal R5.5-5
A Sensor Terminals (A+ • A-)	Round Terminal R1.25-3	Round Terminal R1.25-3
B Sensor Terminals (B1+, B1-)	Round Terminal R1.25-3	Round Terminal R1.25-3

*The above crimp terminals are attached to each terminal of the SHP series at the time of shipment.

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

● To prevent electric shock accidents, perform Class D (Type 3) grounding work.

3-2 Wiring Example



Hot Start Operation

During no-wind operation, energize the heater for preheating, and simultaneously start the blower.
Operation to discharge the required hot air discharge temperature.

continuous hot startis set to **a maximum of 10 minutes** .

●When switching from hot start operation to normal operation (hot air operation).

At least half the duration of the immediately preceding hot start operation

Hot Start Operation → **Normal Operation (Hot Air Operation)** → **Hot Start Operation**

Ensure it is 10 minutes or less.

The duration of the preceding hot start operation
Please ensure it is at least half the duration.

Example) Hot start operation = continuous 5 minutes → Subsequent hot air operation requires at least 2 minutes and 30 seconds.

◆Do not operate hot start continuously for more than 10 minutes.◆

● For wiring, always refer to the Multi-Controller TRC501 instruction manual.

● During normal operation, keep the S5-S6 terminals of the TRC501 open.

● During hot start operation, close the S5-S6 position on the TRC501 and start normal operation (hot air discharge) simultaneously with airflow.
When fixing the TRC501, use the included "Fixing Screws" and ensure the heater case is fixed in a fixed state.

● Use shielded compensation wires [K] for A/B sensor wiring and ensure proper shield grounding is implemented.
Additionally, wire the A/B sensors and input/output signals separately to prevent interference from noise and surge voltages.

● Do not route the wiring for the A/B sensors, S5 to S8, and

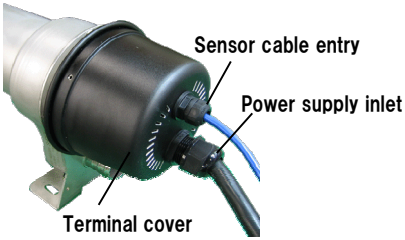
●Reversing the A/B sensor connections will cause the heater to overheat and break. (This is not covered under warranty.)

● Do not route the wiring for the A/B sensors, S5 to S8, and COM-OUT within the same duct as the main circuit (AC).
Please do not do this. It will cause malfunction.

3-3 Wiring

Insert the heater power supply wires through the power supply inlet port and the compensation wires for the A/B sensors through the sensor inlet port.

Please refer to the "Terminal Arrangement" on page 3 of this document for wiring.



《Applicable Cable Diameter for Entry Ports》

- Power Inlet
  - …SHP40: φ6-8
  - …SHP50: φ12-φ18
- Sensor Cable Entry Port
  - …φ6-8

Note: After completing wiring, ensure no leftover materials or cut shavings remain near the terminals.

4. Piping

● Use piping materials such as gas pipes or tubes that can withstand the air pressure, and ensure the hot air outlet has sufficient heat resistance.
Also, use piping that fully accounts for thermal expansion and contraction of the heater case as described in the "Precautions for Mounting the Main Unit" on page 2 of this document.
●When using long piping, pressure loss occurs due to the friction coefficient inside the pipe, pipe diameter.
●If piping is long, pressure loss occurs due to factors like internal friction coefficient, diameter, and pipe bends, reducing airflow volume and cause the heater to overheat. Exercise sufficient caution when selecting piping.
●The longer the piping from the hot air outlet, the more rapidly the temperature drops due to heat dissipation. Therefore, position it as close as possible to the object being heated or apply sufficient insulation.

● Ensure pipes are securely connected to prevent air leaks.
● If metal shavings or debris enter the spot heater through the air supply port during piping installation,causing a short circuit, which is extremely dangerous. Exercise extreme caution during piping installation.

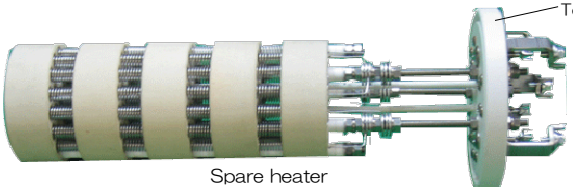
5. Operation

● If power is applied to the heater without ventilation and without control, the heater will overheat and burn out within minutes.
● Use clean air free of dust, oil mist, moisture, etc., as the air supply source. If dust, oil mist, moisture, etc., enters the heater interior,
If dust, oil mist, moisture, etc. enter the heater, insulation will deteriorate, shortening the heater's lifespan.
If dust enters the heater, it will be heated and may be ejected as sparks from the hot air outlet, posing a hazard.
● To prevent electric shock accidents if moisture enters the heater, using an isolation transformer is safe.
●When using compressed air as the air supply source, reduce the supply pressure to 200 kPa or less and supply air at or below the maximum allowable air volume. Also, use an air filter, micro-element filter, etc.
● Dust or other contaminants entering the heater can cause the heater or sensor to break or become damaged. We recommend installing a dust removal filter.
*For dust removal filters, we recommend equivalent products such as the CKD AF1003P series as an example.
●Use the heater with supply air temperatures between 0° C and +70° C and humidity below 85% R.H. (non-condensing).

● Use in environments where combustible gases or flammable liquid vapors are present is dangerous.
● The heater case becomes hot during operation. Install insulation or similar measures as necessary to prevent burns.
● After stopping operation, condensation may occur if humidity is high inside the piping. If condensation causes insulation degradation
If condensation occurs, running the fan for several minutes will eliminate it and restore insulation.

6. Heater Replacement

● If the SHP series heater breaks during use, the heater section can be replaced. Verify the main unit model and heater capacity before replacement.




Accessories: Gasket

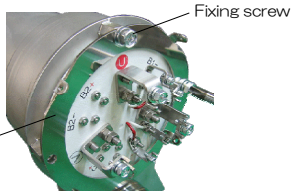
[Spare Heater Replacement Procedure]

① Ensure the power is off, then remove the terminal cover and all terminals.

⬇

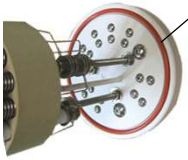
② Remove the four fixing screws for the terminal clamping bracket, and pull out the terminals as a unit.

If any residue (heater wire, water, debris, etc.) remains inside the heater case at this time, remove it.



⬇

③ Insert the included gasket onto the back of the terminal assembly while insert the spare heater into the heater case.



※After insertion is complete, align the terminal orientation.

※ Securely hold the gasket in place with your fingers to prevent shifting. Insert into the heater case while holding it down.

⬇

※Ensure the main unit is placed in a level position. Ensure the heater terminal U is positioned directly upward.

④ Securely tighten the terminal clamping bracket with the fixing screws. Afterward, run air through the system once to check for leaks.

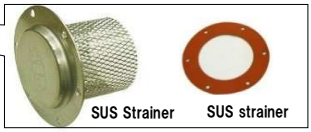
⬇

⑤ Wire the heater power line and each sensor line to the corresponding terminals on the unit, then attach the terminal cover.

If the heater breaks, there is always some underlying cause. Before restarting operation, Before restarting operation, thoroughly investigate and eliminate the cause.

7. Maintenance

● The SHP series comes standard with a SUS strainer for supply air.
• This allows the strainer to be removed and replaced without disconnecting the main unit's piping.
• The strainer can be removed and reinstalled. If the strainer becomes clogged,
• becomes clogged, airflow will decrease or stop, potentially causing heater
• Clean it regularly.



※When reinstalling after cleaning, to prevent air leaks, Be sure to install the gasket.

8. Troubleshooting

No airflow, low airflow	Abnormalities in the air supply source.	Please check the air supply source.
	If the piping becomes detached midway	Check the pipe connections.
	Pipe is too thin and too long or sharp bends bends	Design the piping for low pressure loss..
	Clogging in the filter	Clean filters and other components.
	Solenoid valves, dampers, etc. are closed	Verify the operation of electrical circuits and dampers, etc. and ensure they are functioning properly.
Hot air is not being discharged	Heater power supply	Check the wiring..
	Correct wiring for control. Wiring is not correct	Please check electrical circuits, wiring, etc. Check the electrical circuits and wiring.
	Heater is broken	Check the current value and heater resistance value.
Discharge temperature does not reach set temperature is not being reached	If the air volume is too high relative to the set temperature air volume is too high	Adjust the airflow volume.
	Proper settings for use configuration	Confirm usage conditions and settings.

If the above steps donot resolve the issue, or if other problems occur, please contact us.
For self-inspection tasks, please contact your nearest electrical contractor.

● Insulation resistance measurement. ● Heater current measurement / Resistance measurement.
● Inspection and cleaning for foreign objects inside and at the intake port.
● Inspection of terminal block tightening status. ● Other visual inspections.

9. Warranty

● The warranty period for this unit is one year from the date of purchase.

● If a malfunction occurs during the warranty period under normal use according to the instruction manual, the following applies:
● We assume no responsibility whatsoever for any expenses, profits/losses, or other damages arising from this device.
● The warranty period for this unit is one year from the date of purchase.
● The warranty for repaired parts and procedures is valid for 3 months after repair.
● The following cases are not covered by the warranty:
・Failure due to incorrect use or careless handling, or failure/damage due to abnormal voltage.
・Damage or malfunction caused by improper use or careless handling.
・Items that have been disassembled or modified.
・Damage caused by overheating not attributable to our product.
・Damage, malfunction, or loss caused by lightning strikes, earthquakes, typhoons, flooding, fire, or salt damage.
・Rust formation or electrical leakage due to condensation.
・Damage caused by dust, debris, lint, oil mist, etc.
・Electrical leakage and malfunctions caused by the adhesion of conductive carbon fibers or exposure to acidic gases and corrosive gases or malfunctions caused by acid gases 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 and 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 for installations in locations that are difficult to access, dangerous, or at high elevations.
● The 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, all expenses related to shipping the product for repair and returning it after repair will be borne by the customer.

Manufacturer and Distributor
Kansai Electric Heat Corp.
Head Office 5-4-18 Takaiwanishi, Higashi-Osaka City, Osaka 577-8566
TEL (06) 6785-6001 (Main) FAX (06) 6785-6002
Tokyo Branch Office 2-4-4 Minamikamata, Ota-ku, Tokyo 144-0035
TEL (03) 5710-2001 (Main) FAX (03) 5710-2005
Homepage:**www.kansaidennetsu.co.jp**