

Please send this operation manual to the final customer without fail.

Preservation

TSK Hot-air generator B-type series

TSK-82B • 82BS

Operation manual

● Please read this without fail before use.

- ◆ This time, thank you very much for purchasing the hot-air generator.
- ◆ Please confirm whether the model, type, voltage and the order article are not wrong by the name board of this machine.



1. Attention on use
2. Installation
3. Piping
4. Power supply
5. Terminal explanation
6. Wiring
7. Safety circuit
8. Air volume control
9. Maintenance inspection

When using this machine, it is essential that engineers design a [control panel with temperature control and safety circuits] and configure the circuits.

Be sure to secure the temperature control circuit and safety circuit before starting operation of the machine. If the circuit to shut off the heater power supply is not configured at each safety circuit terminal equipped on the machine, the heater will run dry in the event of an abnormality, leading to a serious accident such as heater disconnection or fire (Refer to Catalog No. 4-1 Control Panel Circuit Example).

If control panel is not available, use our Digital temp. controller TRT series and TR

It should be no voltage fluctuations when you operating the Heater at 50 Hz. Voltage fluctuations will cause the motor temp. rise which lead to the serious malfunction. Please use the inverter to operate Heater as much as possible.

<Accessories>

- Glass tape for air leak prevention: 1m×1pc.



The contents of this instruction manual are subject to change without notice.

The figures and indications in this instruction manual do not guarantee the actual specifications.

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KANSAI ELECTRIC HEAT CORP.

1. Attention on use

✖ Please confirm without fail before use.

For the hot-air generator is used without malfunctioning

◆ Important matters that demand special attention that became the cause of malfunction that occurred in the past is entered. Please inquire with the use method of your company.

- *If the hot-air generator is used without blow, the heater snaps. Please secure the safety circuit without fail at the time of the trial run.*
- *Please supply the power supply for safety circuit (DC24V) without fail to the terminal V+ and V-. If the hot-air generator is used without supplying it, the safety circuit is not operated.*
- *Please secure the safety circuit by the safety circuit terminal. Important accident may occur if the hot-air generator is operated without securing the safety circuit.*
- *Please attach the demi-filter or CR-filter without fail to the suction side of the hot-air generator.*
- *Please clean always the filter that is used or wire net of the hot-air generator inlet. (Standard equipment) Heater inside is overheated by the clogging of the filter and the hot-air generator may can not operate. (Wire net is not equipped to the type without blower.)*
- *Hot-air generator malfunctions when these adhered to the controller inside of the hot-air generator in the case that dust, mine dust, floating objects that pass electricity of carbon fiber, oil, lampblack, oil mist, moisture, and vapor is included to the atmosphere of the setting place of the hot-air generator.*
- *Hot-air generator can not use in corrosiveness of combustibility gas, inflammability gas, plating, and atmosphere. Please consult us in the advance.*
- *Leakage of the hot-air is occurred without fail on the characteristic of the flexible hose in the case of the piping by the flexible hose to the outlet and inlet of hot-air generator. Electron devices inside the operation panel are damaged by the hot-air of the high temp. that leaked flows backward to the hot-air generator inside. So, please execute the glass tape for the air leakage prevention that was enclosed to the outlet and inlet.*
- *Please do not unite or wire that was adjoined the wiring of the in-output signal and sensor with the power supply line, high tone wave line. Electron devices of the inside are damaged by noise.*
- *Please comply with the instructions of the turn direction of the blower without fail.*
- *Please use the commercial power supply (50/60Hz) that has the sine wave-like to the power supply of the hot-air generator. Please do not use the power supply that has the distortion wave including a high tone wave from the frequency transformation device absolutely. Electron devices of the inside are damaged by high tone wave and noise.*

It should be **no voltage fluctuations** when you operating the Heater at **50 Hz**. Voltage fluctuations will cause the motor temp. rise which lead to the serious malfunction. Please

2. Installation

① Attachment attitude

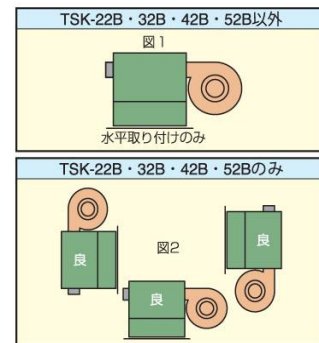
Please comply with the attachment attitude of the right figure.

② Please fix it firmly as occasion demands.

Fixation metal fittings of TSK-22B - 52B can attach to the side. Please fix TSK-62B - 102B, BS, and BP-type firmly by using the fixation hole.

③ Place where can not establish

- Upper part of generation thing
- Place where back is stuck to wall etc.
- Neighborhood of combustible
- Place where height is more than 1000m
- Place where air pressure is low
- Outdoor, and place where is exposed to the storm
- Place where ambients humidity is more than 85%R.H.
- Places of there are many dust
- Place where ambients temp. is more than 0 - +40 °C.
- Place where has vibration
- Place where acid and corrosiveness gas is floating
- Room where is tightly sealed and case inside
- Place where has floating objects that pass electricity (Carbon fiber etc.)



3. Piping

① Please fix the piping to the outlet and inlet certainly.

Leakage of the hot-air is occurred without fail on the characteristic of the flexible hose in the case of the piping by the flexible hose to the outlet and inlet of hot-air generator. Electron devices inside the operation panel are damaged by the hot-air of the high temp. that leaked flows backward to the hot-air generator inside. So, please execute the glass tape for the air leakage prevention that was enclosed to the outlet and inlet.

② Please pipe as thickly, short, and gradual curve as possible.

③ Please insulate sufficiently without fail to piping.

④ Please do not hang the pulling load to the outlet flange in the condition that the hot-air generator with the outlet flange was fixed.

⑤ Please do not hang the pulling load to the piping or other sources, that thin sheet metal is used in some parts of the suction side.



Execution example of the glass tape for air leakage prevention

Attention Please pay attention as the wire net for the heater clogging prevention is not equipped to the inlet of the type without blower.

Attention Please use the demi-filter of the option without fail. It becomes the cause of a fire because the garbage etc. that became to the spark is discharged from the outlet if the demi-filter is not used.

Attention Hot-air can not circulate in the case that toluene, thinner, and plentiful vapor are included to suction air. (Please use the heat exchanger.) Please use after the density of gas is diluted to less than 1/50 - 1/100 of the explosion limit by air in the case that combustibility gas is included to suction air.

Attention Please do not touch during operation because the neighborhood of hot-air outlet and the blower at hot-air circulation becomes hot. You may burn.

4. Power supply

① Please ask the connection of the power supply and ground construction work to the electric repairing work technician.

② Terminal structure and arrangement differs by the type. Please wire certainly on the basis of terminal explanation of P3 after the type is confirmed.

③ Please use the commercial power supply (50/60Hz) that has the sine wave-like to the power supply of the hot-air generator. Please do not use the power supply that has the distortion wave including a high tone wave from the frequency transformation device absolutely.

④ Please establish the exclusive use circuit. Please decide the capacity of the sensitivity current in accordance with the following table in the case that the electric leakage circuit breaker is attached.

⑤ Please execute the ground construction work to prevent electric shock accident prevention. (Less than 300V : D-class ground Less than 600V : C-class ground)

Attention Please block the power supply without fail at the time of wiring and inspection. You receive an electric shock when work is conducted in the condition that the power supply is turned ON.

Model	Rough standard of the sensitivity current of the electric leakage circuit
TSK-82B(S)	About 100mA

※About 10 times of the early period leakage current are general as the sensitivity current of the electric leakage circuit breaker.

It should be no voltage fluctuations when you operating the Heater at 50 Hz. Voltage fluctuations will cause the motor temp. rise which lead to the serious malfunction. Please use the inverter to operate Heater as much as possible.

5. Terminal explanation

TSK-82B

Heater current (at 200V)

Blower rating current (200V 50Hz/200 • 220V 60Hz)

TSK-82BS

Three-phases

TSK-82B:

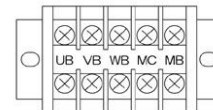
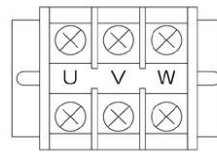
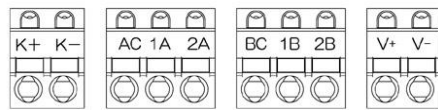
TSK-82BS :

30kW 86.6A 24kW 69.3A

Three-phase 1500W 6.2/5.7 • 5.4

Three-phase 2200W 8.3/8.2 • 7.5

M

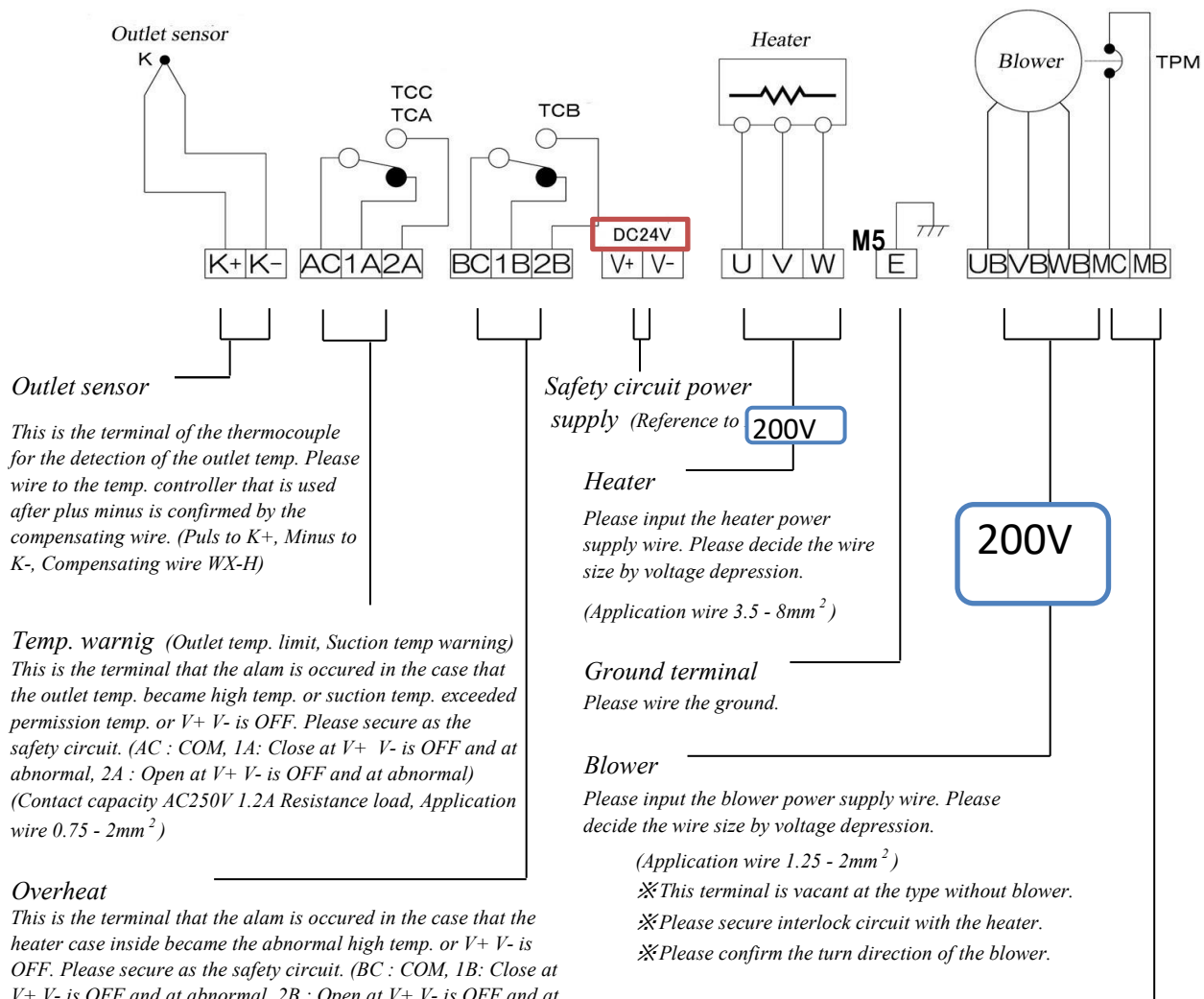


Spring connection terminal

Screw size M6

Screw size M3.5

• Please do not wire each terminal of the outlet sensor, overheat, temp. warning, and blower warning with the power line and harmonic line. (Please do shield processing.)



Outlet sensor

This is the terminal of the thermocouple for the detection of the outlet temp. Please wire to the temp. controller that is used after plus minus is confirmed by the compensating wire. (Puls to K+, Minus to K-, Compensating wire WX-H)

Temp. warnig (Outlet temp. limit, Suction temp warning)

This is the terminal that the alam is occured in the case that the outlet temp. became high temp. or suction temp. exceeded permission temp. or V+ V- is OFF. Please secure as the safety circuit. (AC : COM, 1A: Close at V+ V- is OFF and at abnormal, 2A : Open at V+ V- is OFF and at abnormal) (Contact capacity AC250V 1.2A Resistance load, Application wire 0.75 - 2mm²)

Overheat

This is the terminal that the alam is occured in the case that the heater case inside became the abnormal high temp. or V+ V- is OFF. Please secure as the safety circuit. (BC : COM, 1B: Close at V+ V- is OFF and at abnormal, 2B : Open at V+ V- is OFF and at abnormal) (Contact capacity AC250V 1.2A Resistance load, Application wire 0.75 - 2mm²)

Attention

Please design the circuit that blocks the heater power supply forcibly without fail by using NFB with trip when the overheat and temp. warning of the safety circuit operated in the case that TSK-42B and 52B is used with the upward or downward attitude.

Snapping of the heater can not be prevented f the hot-air generator is operated without securing the safety circuit.

Please refer to P15 of catalog No.4-1 about the circuit example.

Safety circuit power supply

(Reference to 200V)

Heater

Please input the heater power supply wire. Please decide the wire size by voltage depression.

(Application wire 3.5 - 8mm²)

Ground terminal

Please wire the ground.

Blower

Please input the blower power supply wire. Please decide the wire size by voltage depression.

(Application wire 1.25 - 2mm²)

※This terminal is vacant at the type without blower.

※Please secure interlock circuit with the heater.

※Please confirm the turn direction of the blower.

Blower warning

Contact of this terminal becomes to open when the blower motor became abnormal high temp. Please secure as the safety circuit. (Contact capacity AC250V 1.2A Resistance load, Application wire 0.75 - 2mm²)

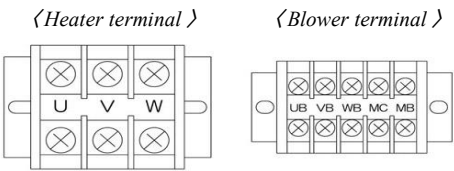
※This terminal is vacant at the type without blower.

It should be no voltage fluctuations when you operating Heater at 50 Hz. Voltage fluctuations will cause the motor temp. rise which lead to the serious malfunction. Please use the inverter to operate Heater as much as possible.

6. Wiring

【Heater terminal and Blower terminal】

Please tighten with proper torque and please use the circle type terminal without fail about the wiring to the heater and blower terminal. Please do not wire in the condition of the electric wire that covering was peeled and please do not use Y-type terminal. Because it may generate by the terminal gets loose.



※ Y-type terminal can be used to the terminal of blower MC-MB abnormality.

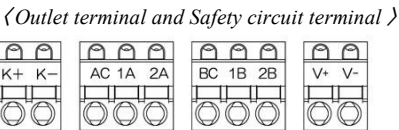
- Proper torque M3.5 → 1.4N · m
- M5 → 3.0N · m
- M6 → 3.7N · m

【Outlet terminal and Safety circuit terminal】

: FK2.5/2-ST (Outlet sensor and Safety circuit power supply) and FK2.5/3-ST (Temp. warning and Overheat) made of PHOENIX CONTACT CO., LTD.

※ Safety circuit terminal of TSK-17B is the same size (M3.5) as the heater terminal and blower terminal.

Please use the pin terminal without fail about the wiring to the outlet and safety circuit terminal. The wire in the condition of the electric wire that covering was peeled can be used in the case of single wire. Please plug the pin terminal or single wire to the wiring mouth.



- ① Please peel the covering of the electric wire 10mm. It may do the short circuit by contacting with the wiring of the neighbour in the case of that the length that was peeled too long. And, the electric wire may come off in the case of that the length is too short. Please twine the electric wire so as not to become discrete and please do not do solder processing.
- ② Please plug and crimp as the core of the electric wires protrude about 0.5mm from the sleeve. Please confirm whether the appearance of the pin terminal is not damaging and is crimped correctly after crimping.

《 Recommendation pin terminal 》

Name	Model	Size of the electric wire (mm2)	Application crimp tool	Maker
Insulated pin terminal	AI0.5-10WH	0.5	CRIMPFOX	PHOENIX CONTACT CO., LTD.
	AI0.75-10GY	0.75	ZA3	
Insulated pin terminal (TC type)	TGNTC-1.25-11T	0.3 - 1.65	NH65	NICHIFU CO., LTD.
Blade terminal (BT type)	BT0.75-11	0.3 - 0.75	NH67	

- ③ Please plug the pin terminal to the terminal. Please plug the electric wire in the condition that the open and close button is pushed in to the back firmly with the minus driver in the case of the single wire. Please draw out the electric wire in the condition that the open and close button is pushed in to the back firmly with the minus driver in the case that the electric wire is removed.

- (Attention)
- Please wire each wiring so as not to contact with the wiring of the vicinity.
 - Please crimp correctly so that a part of the wire does not come out.
 - Terminal may damage if the electric wire is drawn out without pushing in the open and close button firmly.

7. Safety circuit

● About the power supply of the safety circuit

Electron type safety circuit by the thermocouple is installed to TSK-22B - 102B. DC24V (Consumption electric power 3W) is necessary as the power supply for safety circuit when the safety circuit operated.

* The recommendation switching power supply for Input AC100 - 200V and Output DC24V : S8JX-N01524C, S8VM-01524C made of OMRON

Please confirm that DC24V is supplied to the safety circuit power supply terminal and without fail and the power supply lamp (Green) of the safety circuit print board and safety circuit power supply (green) is lighted.

(An intermittent buzzer sounds for a short time when power is supplied.) Also, if the polarity of 24VDC is mistaken, each power lamp will not light and the safety circuit will not operate.

Each safety circuit acts the same contact when abnormality occurred in the case that DC24V is not supplied to the safety circuit power supply.

Safety circuit power lamp indicates supplying DC24V properly to safety circuit board.

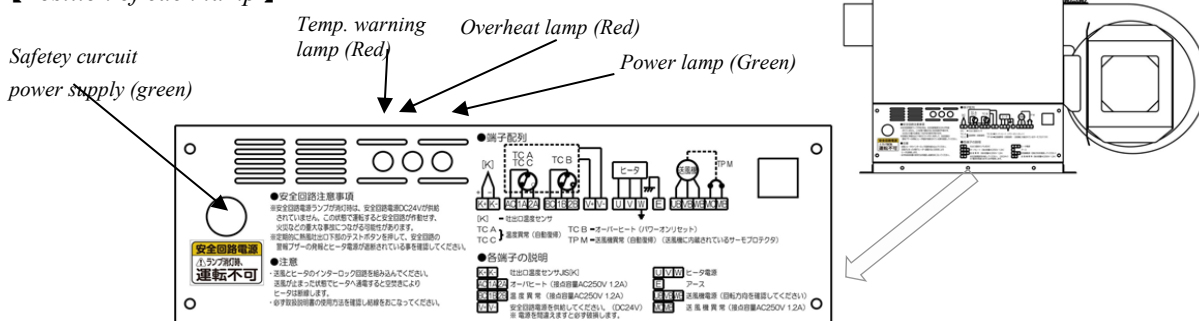
Even if the green lamp is on, you have to provide a circuit device that can surely cut power supply to heater when abnormal occurs. Otherwise, it causes disconnection of heater and leads to serious accident such as fire.

《Especially please pay attention》

Temp. warning and overheat are detected at the time of the operation start in the case that the safety circuit power supply was composed the circuit that becomes ON at the same time as the heater and blower power supply. In this case, please establish the delay timer (about 2 seconds) to the detection circuit of temp. warning and overheat and please establish the circuit that the power supply is supplied to the detection circuit of the temp. warning and overheat after the supply of the safety circuit power supply.

- (Attention)
- Safety circuit does not operate at all if the power supply is not supplied to the safety circuit. So, please supply the power supply to the safety circuit without fail.
 - Please confirm each following abnormal content in the case that the safety circuit operated while the hot-air generator drives.
 - Hot-air generator can make in overheat condition by the test button is pushed when the safety circuit is operating (during the power supply input). Please confirm that the heater power supply becomes OFF by pushing the button with the plus driver before use or periodic.

【Position of each lamp】



7-1 Temp. warning (terminal: AC-1A-2A)

Model that the discharge temp. upper limit (TCA) was installed : All model (Auto-return type)

Model that the suction temp. warning (TCC) was installed : TSK-22B - TSK-102B (Auto-return type)

Model that the suction temp. warning (TPC) was installed : TSK-17B (Auto-return type)

Sensor that opens or closes the contact of the terminal and temp. warning lamp (Red) is lighted (except TSK-17B) is built in the case that discharge temp. or suction temp. exceeded the upper limit.

Sensor that opens or closes the contact of the terminal and the buzzer sounded, the over heat lamp lighted, the power lamp blinks in the case that ambient temp. exceeded 65 °C

《Main cause》

- Upper limit of the outlet temp. is exceeding when the temp. of the place that parted is controlled.
- High temp. more than the max. suction temp. is sucking
- Air volume is decreasing by the excessive pressure loss
- Air volume is decreasing by the wire net of inlet is clogged

《Return method》

It returns automatically when the hot-air generator was cooled sufficiently after the cause of abnormality is removed.

7-2 Overheat (terminal: BC-1B-2B)

Model that TCB was installed : TSK-22B - TSK-102B Detection hold type (Power on reset type)

Model that TCC was installed : TSK-17B (Manual return type)

Sensor that opens or closes the contact of the terminal and overheat lamp (Red) is lighted (except TSK-17B) is built in the case that the heater case became the abnormal high temp.

《Main cause》

- Air volume is decreasing by the wire net of inlet is clogged
- Resistance of the outlet by adjacency of the product
- Sufficient exhaust outlet of the oven etc. can not be secured
- Lock of blower motor by the foreign substance was mixed

《Return method》

- TSK-22B - TSK-102B (Power on reset type)

Please turn OFF the power supply of the safety circuit. And, please turn ON again after the cause of the overheat was removed and this machine was cooled sufficiently. But, overheat occurs once again if temp. is not coming down.

- TSK-17B

Please remove the rubber cap of the this machine reverse side and please push the reset button of the inside strongly after the cause of the overheat was removed and this machine was cooled sufficiently. At this time, please block the power supply without fail.

Attention : You receive an electric shock if the reset button is pushed without blocking the power supply.



7-3 Blower warning (TPM) (terminal: MC-MB)

Model that was installed : TSK-17B - TSK-102B Detection hold type (Auto-return type)

Sensor that opens the contact of the terminal is built in the case that the motor becomes abnormal high temp. by the over load, over current, and lock condition of the blower.

《Main cause》

- Wear of the bearing
- Use of the nozzle of the narrow opening extremely
- Voltage other than the rating
- Piping of the big pressure loss

《Return method》

It returns automatically when the blower was cooled sufficiently after the cause of abnormality is removed.

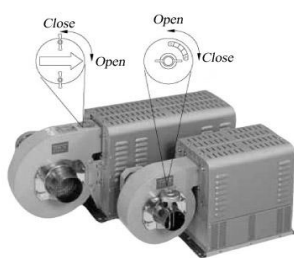
8. Air volume control

- Please adjust the air volume by the dumper in the case that the temp. that was set up does not rise.

《 TSK-17B 》



《 TSK-22B - 102B 》



* Hot-air generator may become the over load by piping. At the time, please squeeze the air volume properly by the dumper.

Attention

- Please inspect and clean always as the wire net of the inlet is clogging. It is very dangerous because the heater is overheated abnormal when the hot-air generator is operated in the condition that the wire net was clogged.
- Please tighten the butterfly screw firmly after the dumper was adjusted. Drying may not produced sufficiently by the air volume changes during operation when the hot-air generator is operated in the condition that the screw got loose.
- Please do not adjust the dumper at the time of hot-air circulation. You may burn by becoming hot the dumper.
- Dumper does not become all close to safety because the min. air volume is flowed.

9. Maintenance inspection

Inspection of the inlet wire net and filter

- ◆ Wire net is equipped to the inlet of the hot-air generator. Please inspect always and clean periodically the wire net of the inlet and filter (option). Overheat or temp. warning occurs by the inside of the heater case becomes a abnormal high temp. if the wire net and filter is clogged.

Individual inspection

- ◆ We suggest that the individual inspection is conducted in the case that the use period exceeded 10 years because this machine is used safely.

【Individual inspection item】

- Measurement of the insulation resistance value
- Tightening inspection of each terminal
- Inspection and clean of the foreign substance mixing inside the controller
- Inspection and clean of the foreign substance mixing inside the heater case and inlet
- Action and generation inspection of the electricity part
- Measurement of the heater current value
- Inspection by watching eyes of the other

Please ask to the electrician about the individual inspection.

Attention Please do not conduct the insulation resistance voltage test to this machine. (It had conducted at the time of shipment.) It becomes the cause of malfunction.



Hot-air generator

Maker
Sales



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