

For B-type series
Auto-temp. controller TR-series

Operation manual

● Please read this without fail before use.

- ◆ This time, thank you very much for purchasing the Auto-temp. control TR-series.
- ◆ Please confirm whether the model, type, voltage and the order article are not wrong by the name board of this machine.



1. Installation
2. Power supply
3. Terminal structure and terminal arrangement
4. Wiring
5. Connection figure
6. Normal operation
7. External operation
8. External temp. control
9. Abnormal detection
10. Output terminal
11. Maintenance inspection

- TR31A
- TR51A
- TR81A

- TR101A
- TR151A



1. Installation

① This controller is the wall tapestry or installation type. Please establish the vertically and level condition without fail.

※ The space of the base and back is necessary for the cooling inside controller. Please do not remove the fixation metal fittings.

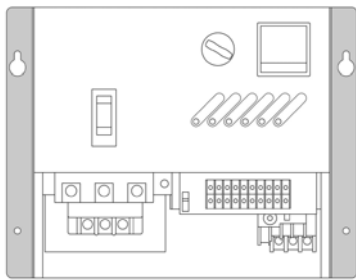


Figure 1

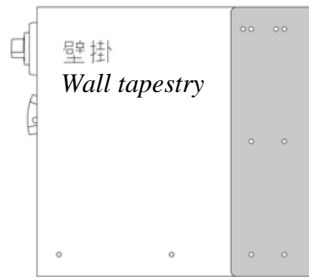


Figure 2

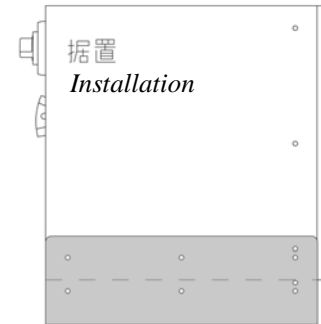


Figure 3

※ Fixation metal fittings are attached for inside at shipment. Please attach the fixation metal fittings for outside at use. (Figure 1)

※ Fixation furniture is attached in the direction of the wall tapestry at shipment. (Figure 2)

※ Please change the attachment position of the fixation metal fittings in the case of the installation. (Figure 3)

② Please fix it firmly as occasion demands.

③ Place where can not establish

- Place where ambients humidity is more than 85%R.H.
- Place where ambients temp. is more than 0 - +45 °C.
- Neighborhood of combustible
- Place where acid and corrosiveness gas is floating
- Place where acid and corrosiveness gas is floating
- Place where has floating objects that pass electricity (Carbon fiber etc.)
- Place where height is more than 1000m
- Room where is tightly sealed and case inside
- Place where has vibration
- Upper part of generation thing
- Place where back is stuck to wall etc.
- Place where air pressure is low
- Outdoor, and place where is exposed to the storm
- Places of there are many dust

2. Power supply

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

② 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.

③ 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.

④ Please execute the ground construction work to prevent electric shock accident prevention. (Less than 300V : D-class ground Less than 600V : C-class ground)

⑤ About the connection of the power supply, please use the entrance wire hole of 5 direction that is in the Front, under, and both sides face of TR-series.

Attention The voltage depression is occurred by too long wiring. So, please pay attention.

Attention Please block the power supply without fail at the time of wiring and inspection. Please block the factory power supply without fail because electricity is flowing to the control circuit even if the breaker (NFB) of the controller is turned OFF. You receive an electric shock when work is conducted in the condition that the power supply is turned ON.

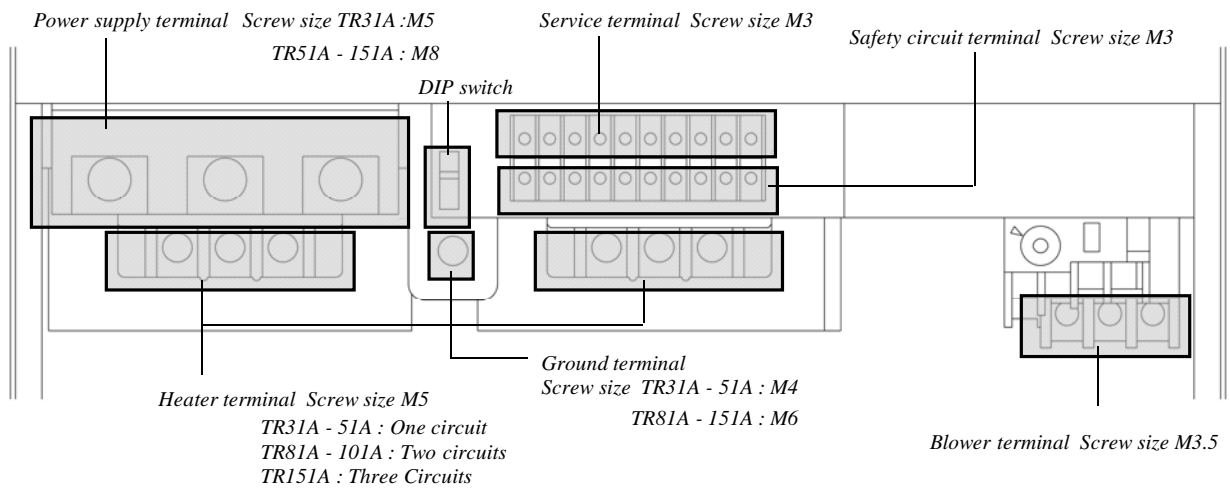
Attention Please secure sufficient capacity in the case that the socket was established for connection. Socket may cause contact defectiveness, absence phase, generation, and malfunction by passing year change. So, please refrain from the use of the socket.

Attention Hot-air generator is the device that is used in industry environment mainly. Radio wave obstacle may occur if this is used in residence environment. User of this product must take the appropriate means for obstacle reduction.

Model	Rough standard of the sensitivity current of the electric leakage circuit
TR31A · 51A	About 50mA
TR81A · 101A	About 100mA
TR151A	About 200mA

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

3. Terminal structure and terminal arrangement



Output terminal

※Output contents of the output terminal are changed by the DIP switch. (P.05)

Contact capacity Less than AC250V 1A, DC30V 1A (Unvoltage contact signal output)

BW : Blower abnormal output

This terminal is turned ON when the blower is abnormal.

TA : Temp. abnormal / Temp. alarm output

This terminal is turned ON when temp. is abnormal and temp. alarm is output.

OVH : Overheat output

This terminal is turned ON at the overheat.

External temp. control input terminal

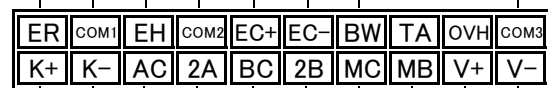
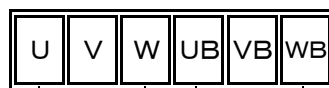
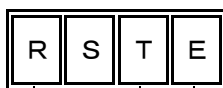
This terminal is used when temp. is controlled by other temp. controller. Please input SSR drive reverse action output (DC12 - 24V). This time, please use as this machine temp. controller is for the upper limit of outlet temp.

External heater ON/OFF terminal (Short circuit at shipment)

This terminal is used in the case that the heater is turned ON/OFF by the outside signal. Input is point of contact output. (Terminal voltage is less than DC12V 3.6mA)

External operation ON/OFF terminal (Short circuit at shipment)

This terminal is used in the case that operation is turned ON/OFF by the outside signal. Input is point of contact output. (Terminal voltage is less than DC12V 3.6mA)



Ground terminal

Please wire the ground wire.

Power supply input terminal

Please supply the factory power supply.

Heater output terminal

Please connect to the heater terminal U(U1 - U3), V(V1 - V3), W(W1 - W3) of the hot-air generator.

Please decide the size of the electric wire in consideration of voltage depression. (Application electric wire 3.5~8mm²)

Blower output terminal

Please connect to the blower terminal UB, VB, WB of the hot-air generator.

Please decide the size of the electric wire in consideration of voltage depression. (Application electric wire 1.25~2mm²)

※Please connect the power supply wire of the blower in the case that the customer prepares the blower. But, only blower that was instructed can be connected at order.

Please connect to the safety circuit terminal V+, V- of the hot-air generator.

Please connect to the blower abnormal terminal MC, MB of the hot-air generator.

Please connect to the overheat terminal BC, 2B of the hot-air generator.

Please connect to the temp. abnormal terminal AC, 2A of the hot-air generator.

※Application electric wire of each safety circuit is 0.75 - 2mm².

Please connect to outlet sensor K+, K- of the hot-air generator by the compensating wire without mistake plus and minus. (K+ : Plus, K- : Minus, Compensating wire : WX-H)

※Please short-circuit the safety circuit terminal MC - MB in the case that the customer prepares the blower.

4. Wiring

- ① Please ask the wiring to the electric repairing work technician.
- ② Please confirm the capacity of super heater and TR-series once again.
- ③ Please wire certainly in accordance with each operation manual after the type is confirmed because the terminal structure and terminal arrangement differ by TR-series type.
- ④ About the wiring, please use the entrance wire hole of the under face of TR-series.

Attention It becomes the cause of heater snapping of a wire and fire if the safety circuit power terminal V+, V- is not connected to the safety circuit power terminal V+, V- of the hot-air generator B-type series.

Attention Please use the compensating wire with the shield to the wiring of the outlet sensor terminal K+, K-.

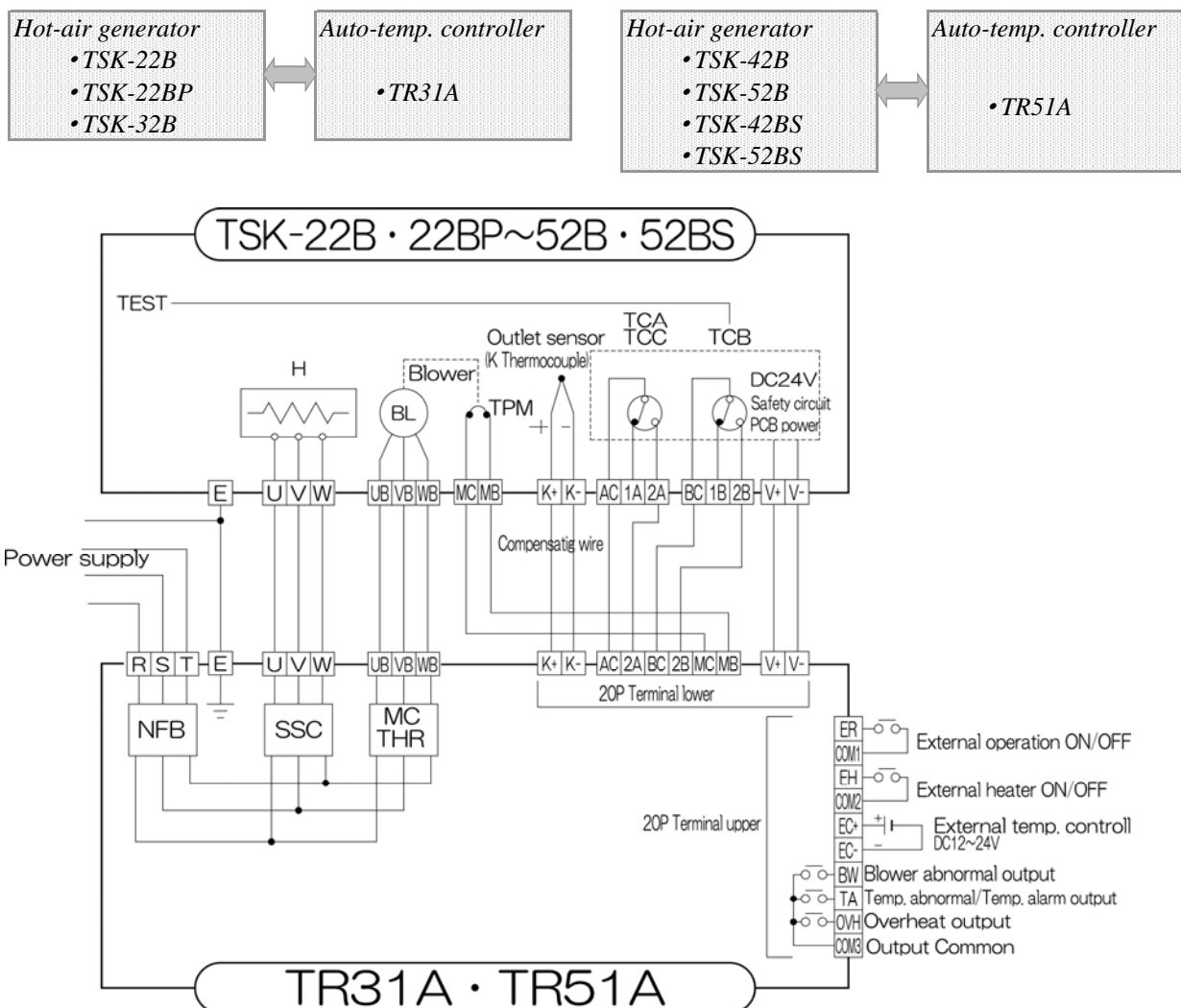
Attention Please do not unite or wire that was adjoined the wiring of the service terminal and sensor with the power supply line, high tone wave ine.

Attention Please block the power supply without fail at the time of wiring and inspection. Please block the factory power supply without fail because electricity is flowing to the control circuit even if the breaker (NFB) of the controller is turned OFF. You receive an electric shock when work is conducted in the condition that the power supply is turned ON.

Attention Snapping of the heater can not be prevented if the heater is operated without securing the safety circuit (overheat sensor).

5. Connection figure

- Please wire in accordance with the following connection figure about the connection the each hot-air generator and auto-temp. controller.

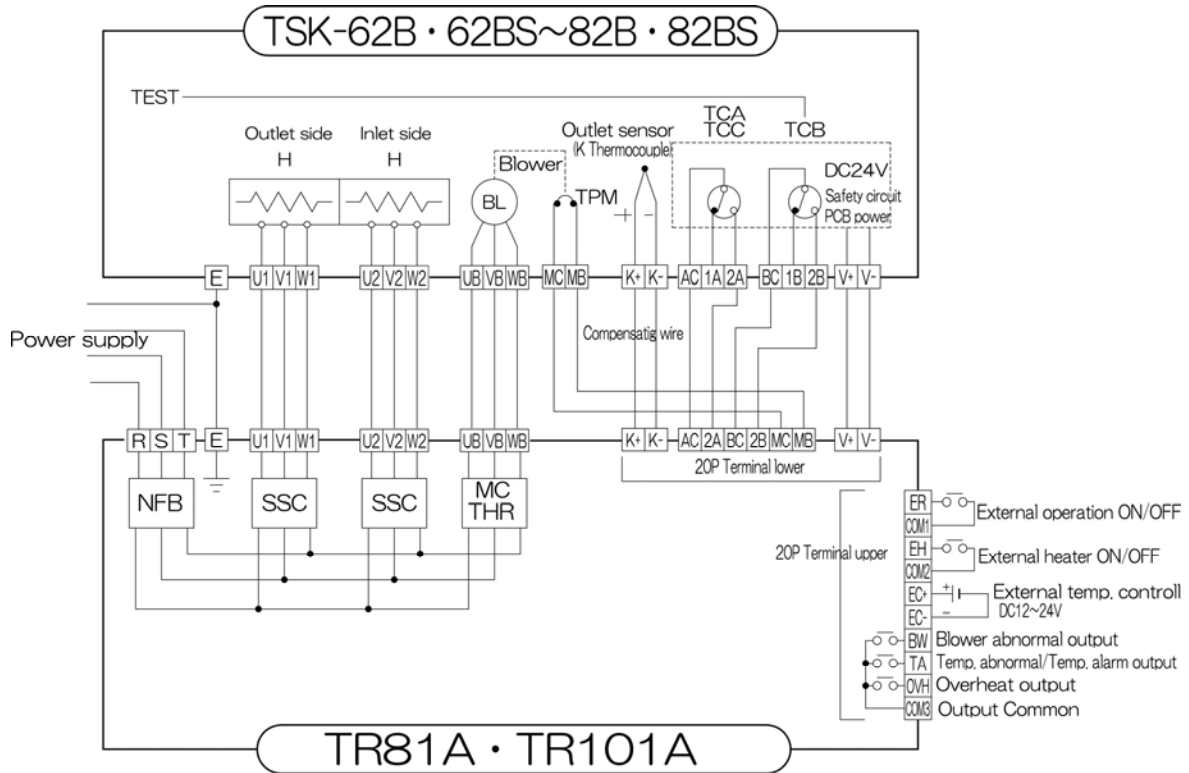


Hot-air generator
 • TSK-62B
 • TSK-72B
 • TSK-62BS
 • TSK-72BS

Auto-temp. controller
 • TR81A

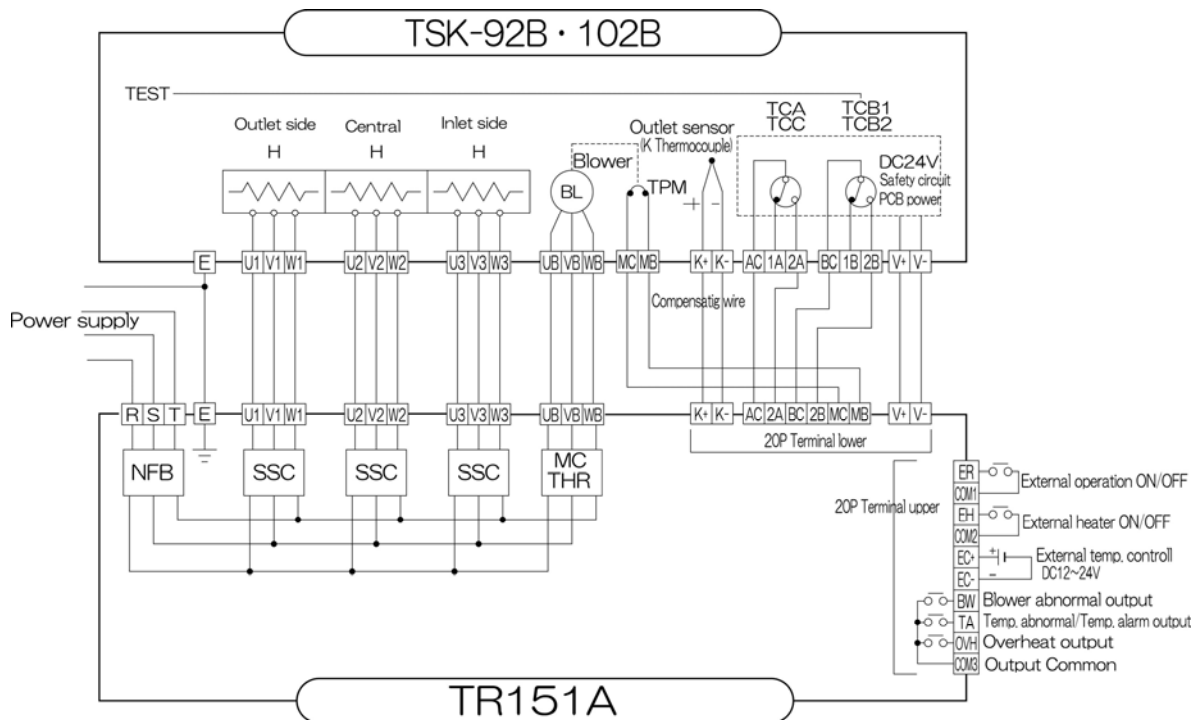
Hot-air generator
 • TSK-82B
 • TSK-82BS

Auto-temp. controller
 • TR101A



Hot-air generator
 • TSK-92B
 • TSK-102B

Auto-temp. controller
 • TR151A

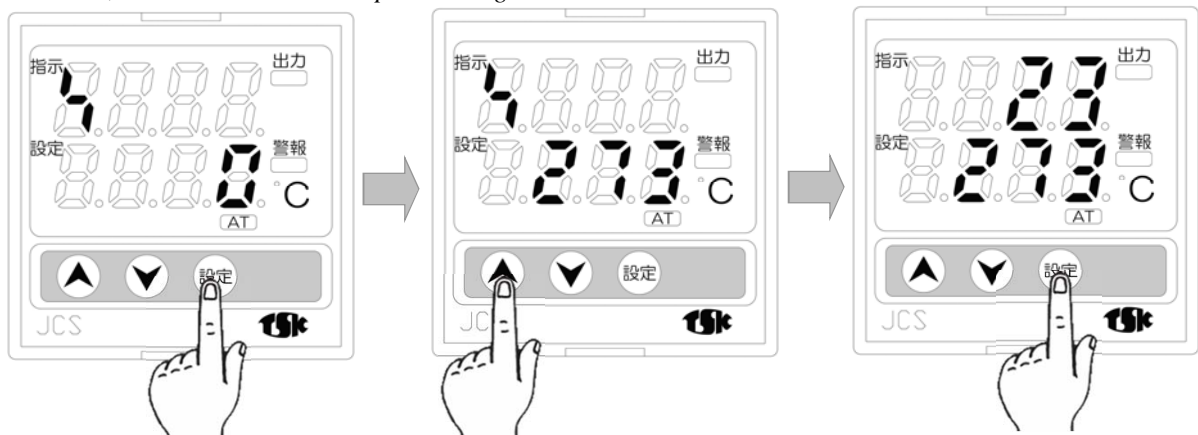


6. Usually operation

- ① Please turn ON the power supply of the factory ('the 1st power supply').
SOURCE lamp (Green) is lighted.
- ② Please turn ON the breaker (NFB) of this machine.
Present temp. is displayed to PV dept., 0 or setting temp. to SV dept., of the temp. controller.
- ③ Please turn BLOW the operation switch for short period. And please confirm the turn direction of the blower of the hot-air generator.
Please replace any 2 wires of the power supply connection wires if the blower is reverse turn (reverse phase).
- ④ Please set up temp.

● TR31A, TR51A

Example : Setting to 273 °C



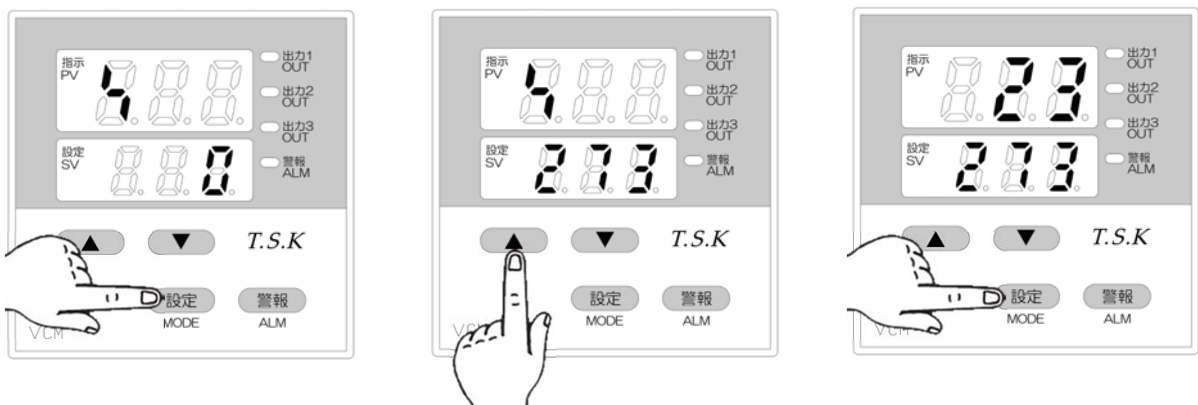
Please push the setting key. S is displayed to PV dept.,

Please set to 273 by the up key. Please push the down key when setting is lowered.

Please push the setting key again. And, please register setting temp. Present temp. is displayed to PV dept. after registration.

● TR81A, TR101A, TR151A

Example : Setting to 273 °C



Please push the setting key. S is displayed to PV dept.,

Please set to 273 by the up key. Please push the down key when setting is lowered.

Please push the setting key again. And, please register setting temp. Present temp. is displayed to PV dept. after registration.

《In the case that the temp. warning is used》 : Only TR81A - TR151A

Please push the ALM key. And, please input the upper and lower limit warning value (0-100) by up-down key.

〈Example〉 When the setting temp. is 273 °C, the alarm is output more than 293 °C and less than 253 °C if 20 is input as the upper and lower limit warning value.

※Temp. alarm is not output if 0 is input as the upper and lower limit warning value.

※Output terminal TA is closed when the temp. alarm is output. But, the heater is not protected (do not turn OFF).

※Alarm is the upper and lower limit deviation warning with waiting. So, the alarm is not output until temp. rises to setting temp. after operation is started.

⑤ Please turn to *HOT-AIR* the operation switch.

Blow lamp (Green) and HEATER lamp (Red) are lighted, and Hot-air operation is started. Only blower is operated if the operation switch is turned to BLOW (Heater is OFF).

⑥ Please adjust the gas capacity of the hot-air generator after the operation is started.

Gas capacity can be adjusted by the damper of the blower of the hot-air generator.

〈About the relation between temp. and gas capacity〉

The following situation occurs in the case that the balance of temp. and gas capacity are bad.

- Temp. is not risen to setting temp. → Gas capacity is big to setting temp. → Gas capacity is decreased
- Temp. is not stabilized to setting temp. → Gas capacity is small to setting temp. → Gas capacity is increased

⑦ Please turn to *STOP* the operation switch when operation is ended. This hot-air generator is not the necessity of cooling operation.

Please do not operate and stop by turning ON and OFF the NFB of this machine. (NFB is constantly ON.)

7. External operation

● ON/OFF of the hot-air generator and the heater can be controlled by the signal from the outside.

● In the case that hot-air operation is conducted by the outside signal

① Please remove the short circuit board of the external operation ON/OFF terminal ER-COM1. And, please connect the input circuit of opening and closing.

(Contact output, terminal voltage is less than DC12V 3.5mA.)

② Please turn OPERATION SW. to HOT-AIR. And, please start the external operation by the external operation ON/OFF terminal ER-COM1 is closed after setting temp.

(This time, please do not remove the short circuit board of the external heater ON/OFF terminal.)

③ Please open the external operation ON/OFF terminal ER-COM1 in the case that the external operation is finished.

※ Please conduct the above external operation procedure in the case that the hot-air generator is stopped simultaneously when the other device that was combined is stopped by abnormally.

● In the case that STOP -BLOW -HOT-AIR is changed by the outside signal

① Please remove the short circuit board of the external operation ON/OFF terminal ER-COM1 and the external heater ON/OFF terminal EH-COM2. And, please connect the input circuit of opening and closing.

(Contact output, terminal voltage is less than DC12V 3.5mA.)

② Please turn OPERATION SW. to HOT-AIR. And, please start the external operation by the external operation ON/OFF terminal ER-COM1 is closed in the condition that the external heater ON/OFF terminal EH-COM2 is opened after setting temp. This time, the hot-air generator is become the blow operation.

③ Next, please close the external heater ON/OFF terminal EH-COM2. This time, the hot-air generator is become the hot-air operation.

(Hot-air generator can not be operated even if the external heater ON/OFF terminal EH-COM2 is closed in the condition that the external operation ON/OFF terminal ER-COM1 is opened.)

8. In the case that the external temp. control is used

● Hot-air generator is controlled by the signal of the auto-temp. controller that was established to the outside. This time, please use the auto-temp. controller of this machine as the discharge temp. limiter.

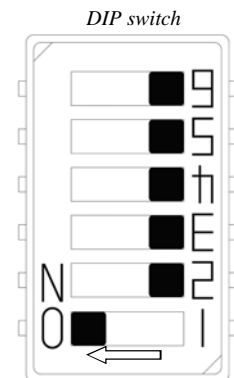
● Hot-air temp. setting of SV dept. and hot-air temp. process of PV dept. becomes temp. of the outlet sensor when the external auto-temp. control function is used.

① Please prepare the auto-temp. controller that SSR drive reverse output (DC11 - 24V) was selected at the outside.

② Please input the output of the auto-temp. controller that was established to the outside to the external temp. control terminal EH+ - EH-.

③ Please set temp. by the auto-temp. controller of this machine. Please pay attention the exchangeability with the setting of the auto-temp. controller that was established to the outside, and please set because the temp. setting of this machine becomes the limiter of the discharge temp.

④ Please turn ON 1 of the DIP switch of the terminal and please start the usually hot-air operation after the outside auto-temp. controller is set. Hot-air operation is started by the setting of the outside auto-temp. controller.



Attention Please do not operate 4, 5, and 6 of DIP switch. Because this machine is not acted normally.

9. Abnormal detection

● Overheated

OVERHEATED lamp is lighted and all the operation are stopped by the breaker (NFB) of this machine trips in the case that the heater case inside of the hot-air generator became the abnormal high-temp. Please turn OFF the factory power supply and the breaker (NFB) of this machine at first, and please turn ON once again after the cause of oveaheted is removed and this machine is cooled sufficiently.

《Main cause》

- Clogging of the inlet wire net and filter
- Lock of the blower motor by the mixing of the foreign substance
- Exhaust outlet of furnace etc. is not secured sufficiently
- Resistance (pressure loss) of the outlet is big by the adjacency of object work

● Temp. warning

TEMP. WARNING lamp is lighted and the hot-air generator becomes blow operation in the case that discharge temp. or suction temp. exceeded the upper limit. Operation is returned automatically by the discharge temp. or suction temp. drops after the cause of temp. warnig is removed.

《Main cause》

- Outlet temp. exceeded the upper limit at the time of using the external sensor
- Decrease of the air volume by the excessive pressure loss
- Decrease of the air volume by the clogging of the inlet filter
- When hot-air circulation temp. exceeded the upper limit of the suction gas temp. of the hot-air generator

● Blower warning

BLOWER WARNING lamp is lighted and all the operation are stopped when the blower became overload, overcurrent, and lock condition. Operation is returned automatically by the blower motor temp. drops after the cause is removed.

《Main cause》

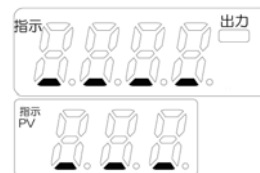
- Wear of the bearing
- Abnormal voltage (Voltage more than the rating)
- Piping of many pressure loss
- Opening the use of an extremely narrow nozzle

● Temp. sensor warning

Following is displayed at PV dept. of the auto-temp controller when the temp. sensor becomes abnormal.



Snapping of a wire or connection defective of the temp. sensor



Reverse connection of plus minus of the temp. sensor

Attention : Please block the source power supply (factory power supply) without fail when the wiring is confirmed and readjusted at the time of abnormal.

10. Output terminal

● Contents of the output terminal can be changed by the DIP switch.

● At the time of shipment

《Condition of DIP switch》

《Output》



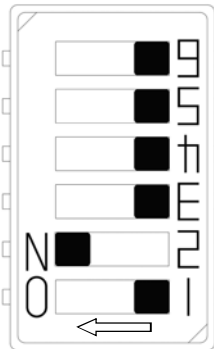
All OFF

- BW : Blower warning output
This terminal turns ON when the blower is abnormal
- TA : Temp. warning output / Temp. aiarm output
This terminal turns ON when temp. is abnormal or temp. alarm
(TR31A and 51A is only temp. warning.)
- OVH : Overheated output
This terminal turns ON the hot-air generator is overhead.

● Change 1

《Condition of DIP switch》

《Output》



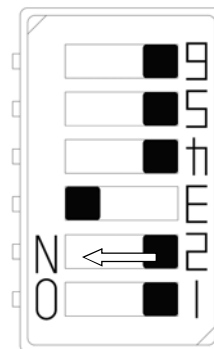
ON onle 2

- BW : Operation output
This terminal turns ON when the hot-air generator is blow operation and hot-air operation.
- TA : Heater output / Temp. alarm output
This terminal turns ON when the hot-air generator is hot-air operation and or temp. alarm is output.
(TR31A and 51A is only hot-air operation.)
- OVH : Abnormal output
This terminal turns ON when the hot-air generator is all abnormal.

● Change 2

《Condition of DIP switch》

《Output》



ON onle 3

- BW : Operation output
This terminal turns ON when the hot-air generator is blow operation and hot-air operation.
- TA : Temp. alarm output
This terminal turns ON when temp. alarm is output.
(TR31A and 51A do not output.)
- OVH : Abnormal output
This terminal turns ON when the hot-air generator is all abnormal.

Attention Please do not operat 4, 5, and 6 of DIP switch. Because this machine is not acted normally.

All output terminal is unvoltage contact signal output that the contact capacity is less than AC250V 1A or DC20V 1A.

11. Maintenance inspection

① Please inspect periodically to confirm the action of the safety circuit.

I recommend that is carried out the individual inspection in the case that the use period exceeded 10 years to have this machine used more safely.

【Item of the individual inspection】

- *Measurement of the insulation resistance value*
- *Increase bundle inspection of each terminal unit*
- *Foreign substance mixing inspection and cleaning inside the controller*
- *Action of the electricity part and generation inspection*
- *Other inspection by eyes*

Please ask to the adjacent electricity businessman about the individual inspection.

② Please inspect periodically the damage of wiring and looseness of the terminal etc.

③ Please clean periodically the SSC cooling fan and exhaust fan (except TR31A) of TR-series. It becomes the cause of malfunction if dust is accumulated to the SSC cooling fan and exhaust fan because the cooling effect of SSC falls off.

④ Inside electron devices of this machine may damage by falling of a thunderbolt. Arrester had better be attached to the power supply department of this machine in the case that this machine is used in the area which has the influence of falling of a thunderbolt.

Inquiry regarding the hot-air generator

Homepage ***www.kansaidennetsu.co.jp***

Or KANSAI ERECTRIC HEAT CORP. Overseas dept. TEL +816-6785-6001