

# Multi-controller

# TRC202

## Operation manual

● Please read this without fail before use.

- ◆ This time, thank you very much for purchasing Multi-controller TRC202.
- ◆ Please confirm whether the model, voltage and the order article are not wrong by the name board of this machine.
- ◆ Please confirm that the following accessories are assembled. And, please confirm that there is not abnormality.
  - Main machine (1pc.)
  - Manual (This book)
  - Rubber foot (4pcs.)
  - Stay for back attachment (1pc.)
  - Butterfly screw (M4/2pcs.)
  - Packing for stay fixation (2pcs.)
  - Metal fittings for panel fixation (2pcs.)



Please confirm that the seal of For using XS-2A, 2B, 2C is attached to the multi-controller without fail in the case that this is used as for the temp. control of the heater for generating the hot-air. Multi-controller is not can be used with XS-2A, 2B, 2C, if there is not this seal.



**Kansai Electric Heat Corp.**

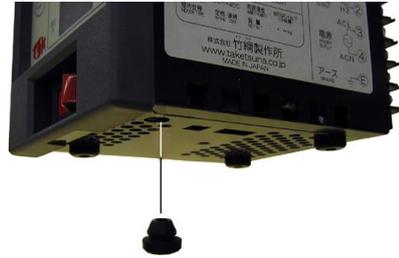
# 1. Setting

- There are 3 ways of setting method. please pay attention the following attention matters especially even either case.
  - Please do not set to the place where the sunshine is related directly and is exposed to rain and wind (Indoor type).
  - Please secure the sufficient attachment space around as the accumulation of heat does not result.
  - Please establish the exhaust for compulsion cooling as the inside temp. of BOX does not become more than +40 °C in the case that this controller is stored to BOX.
  - Please fix firmly to vertical direction.
  - Please do not set to the place where the temp. of using is more than +40 °C less than 0 °C. and the ambients humidity is more than 85%R.H. less than 45%R.H.
  - Please do not set to the place where the noise, impact, and vibration is big.
  - Please do not set to the place where there are the floating objects that pass electricity of dust and iron filings, corrosiveness gas, combustibility gas, and oil-mist etc.

## 《In the case that TRC202 is used alone》

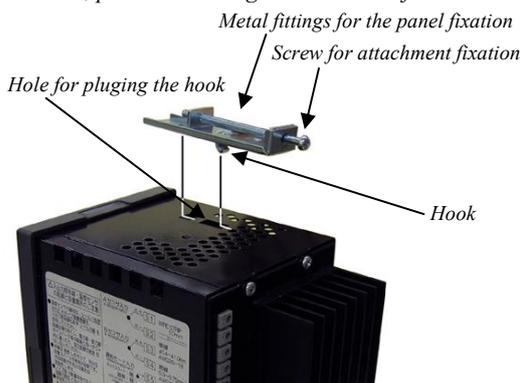
- ① Please plug the rubber foot (4pcs.) for the independence to the hole of the bottom of this controller. And, please use this controller with independence.

- ※ Please defend the above attention even if this controller is used alone.
- ※ The stay for panel fixation and for back attachment can not use in the case that the rubber foot for independence was attached.



## 《In the case that TRC202 is used to set to the panel》

- ① Please process the hole of necessary quantity to the setting panel by consulting the panel cut figure Catalog No.6.
- ② Please insert this controller from the front to panel.
- ③ Please plug the hook part of the metal fittings for the panel fixation of the belonging to the hole for plugging the hook of the this controller. (Top and bottom)
- ④ Please tighten the screw for attachment fixation from the back of the panel fixation metal fittings by the driver. At this time, please do not tighten the screw for attachment fixation too much. (Tightening torque : Less than 0.25N · m)



## 《In the case that TRC202 is set by the stay for back attachment is used》

- ① Please process the hole by the fixation pitch of the stay for the back attachment of the belonging to the setting face (4 places).
- ② Please fix the stay for the back attachment by the screw.
- ③ Please attach this controller to the stay for the back attachment, and please tighten while inserting packing by the butterfly screw with the optional angle.
- ④ Please wire after this controller is turned 90 to the right at the time of wiring.

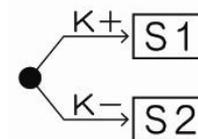


## 2. Terminal arrangement

● This is the explanation of each terminal and the terminal arrangement of Multi-controller TRC202. Please grasp the details of each terminal sufficiently and Please wire with Spot heater.

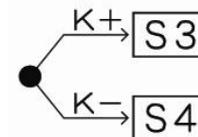
### S1・S2

: Input terminal of A-sensor for detecting the outlet hot-air temp.  
Please input the A-sensor of Spot heater. (K+ - S1, K- - S2) And, please use the compensating wire (K) with the shield to wiring, and please conduct the shield ground construction work without fail.



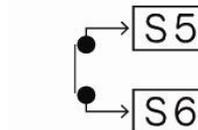
### S3・S4

: Input terminal of the B-sensor for preventing the heater snapping of the wire prevention and for hot-start  
Please input the B-sensor of Spot heater. (K+ - S3, K- - S4) And, please use the compensating wire (K) with the shield to wiring, and please conduct the shield ground construction work without fail.



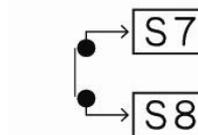
### S5・S6

: Input terminal of the operation mode (Terminal voltage DC15V 10mA)  
Usually operation by open, and hot-start operation by close.  
※ This is effective when S7-S8 terminal is closed only.



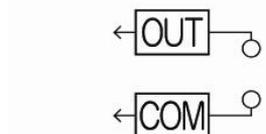
### S7・S8

: Input terminal of the heater ON/OFF (Terminal voltage DC15V 10mA)  
Heater is OFF by open, and heater is ON by close.



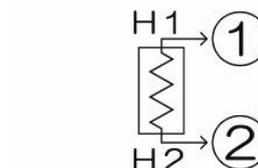
### OUT・COM

: Contact output (Inside relay) (Contact capacity DC30V 1A)  
This terminal turn ON when the function that was set up operated.  
(Select from warning, temp. alam operation, hot-air operation, and hot-start operation.)  
※ Please refer to P.7 about the setting of the output terminal function.



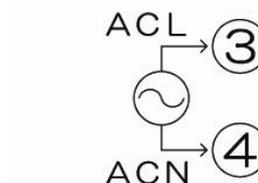
### ①・②

: Output terminal of the heater control (H1 - ①, H2 - ②)  
Please input the heater power supply of Spot heater. And, please decide the size of the power supply by considering voltage depression.



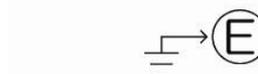
### ③・④

: Terminal of the power supply  
Please input the power supply (Single-phase AC100V of AC200V 50/60Hz) And, please decide the size of the power supply by considering voltage depression.



### E

: Terminal of the ground  
Please conduct Class D ground construction work.



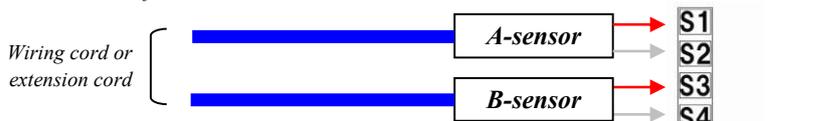
Terminal size and reference application electric wire size	
Screw-less terminal S1 - S8	M4 tterminal ①-④, E
<ul style="list-style-type: none"> <li>• Single wire : <math>\phi 0.4 - \phi 1.0\text{mm}</math>(AWG26 - AWG18)</li> <li>• Twine wire : <math>0.3 - 0.75\text{mm}^2</math>(AWG22 - AWG20)</li> </ul>	<ul style="list-style-type: none"> <li>• Heater current is less than 20A : More than <math>3.5\text{mm}^2</math></li> <li>• Heater current is less than 15A : More than <math>2.0\text{mm}^2</math></li> <li>• Heater current is less than 8A : More than <math>1.25\text{mm}^2</math></li> </ul>
<ul style="list-style-type: none"> <li>• Peeling rang of electric wire covering : 10mm</li> </ul>	<ul style="list-style-type: none"> <li>• Tightening torque : <math>1.18\text{N} \cdot \text{m}</math></li> </ul>

### 3. Wiring

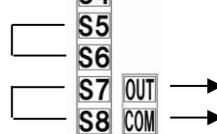
● Please wire Multi-controller TRC202 and Spot heater that are used.

#### 【Spot heater that are used】 SH01・SH11・SH21

- ① Please wire the wiring cord that is belonged to Spot heater or the extension cord of the option to each terminal of Multi-controller TRC202.



- ② Please incorporate the open-close circuit to S5-S6 or S7-S8 in the case that ON/OFF of the heater or change of usually operation and hot-start operation is conducted by the outside signal. (Refer to P.5)

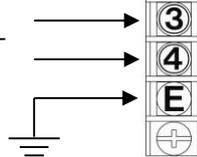


- ⑤ Please incorporate the circuit to OUT-COM in the case that each output signal is used. (Refer to P.7)



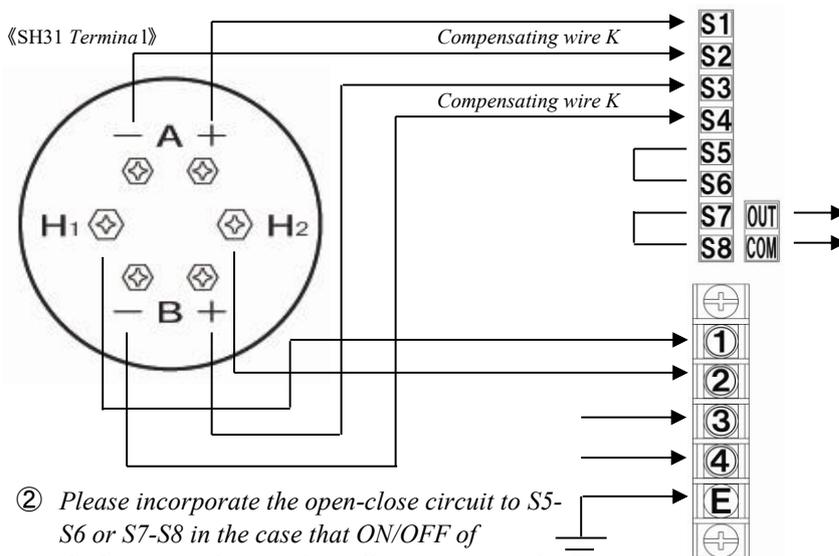
- ③ Please wire AC100V or AC200V to the terminal ③-④.

- ④ Please conduct the ground construction work to the terminal E.



#### 【Spot heater that are used】 SH31

- ① Please wire the plug-in terminal of Spot-heater to each terminal of Multi-controller TRC202. Or, please wire to each terminal as the same as SH01 - 21 in the case that the 0extension cord of the option is used.



- ② Please incorporate the open-close circuit to S5-S6 or S7-S8 in the case that ON/OFF of the heater or change of usually operation and hot-start operation is conducted by the outside signal. (Refer to P.5)

- ③ Please wire AC100V or AC200V to the terminal ③-④.

- ④ Please conduct the ground construction work to the terminal E.

- ⑤ Please incorporate the circuit to OUT-COM in the case that each output signal is used. (Refer to P.7)

Attention : Please conduct wiring work after the power supply is blocked without fail. You receive an electric shock if the power supply is not blocked.

Attention : Please use the compensating wire that was processed the shield to the wire material of each temp. sensor and input-output signal wire.,

Attention : Please make wiring as short as possible, do not wire with the wiring of power supply and inverter together, do not pass to the same duct with them, and do not unite with them.

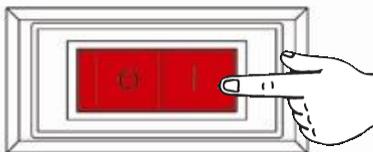
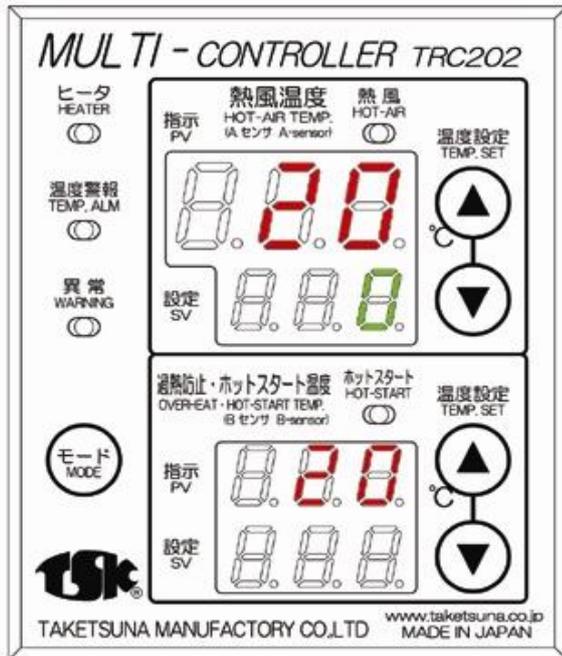
Attention : Please ask wiring to the electric repairing work technician to prevent the accident.

## 4. Usually operation

① Input terminal of the operation mode S5-S6 is open, and input terminal of the heater ON/OFF S7-S8 is open.

③ Please turn ON ( I ) the main SW.

Present temp. is displayed at the hot-air temp. PV display and overheat prevention temp. PV display. And 0 is displayed at the hot-air temp. SV display. (First time)

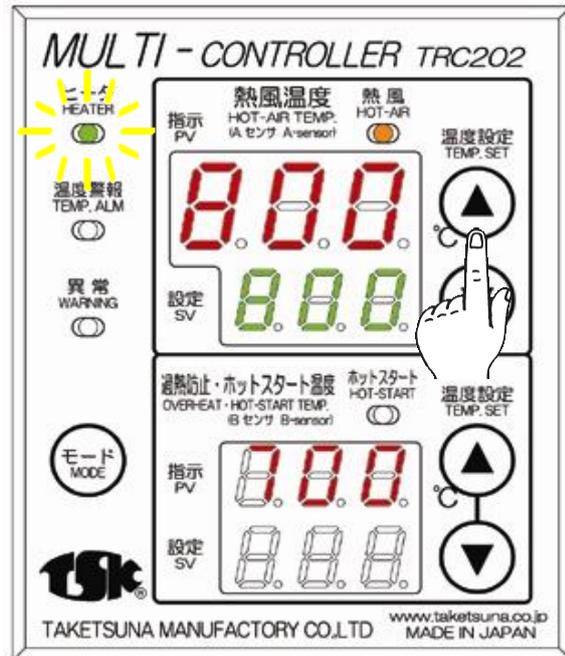


② Please supply air to the heater.

※ Please supply the air more than min. usable air capacity without fail.

④ Please set up hot-air temp. by the temp. setting up down key, and close the input terminal of the heater ON/OFF S7-S8.

Hot-air lamp (Orange) and heater lamp (Green) are lighted and hot-air operation is started. B-sensor temp. rises too as soon as hot-air temp. rises.



※ Hot-start temp. SV display is not displayed at all.

※ When the control of the heater is started heater lamp flickers.

### ● Soft start operation

Heater output is controlled from the operation start postperiod because over-shoot of the discharge temp. is restrained even in which setting temp. area. Temp. rise in the operation is monitored by this control. And, over-shoot of the discharge temp. is reduced substantially by the max. temp. rise width for one second is controlled. (Start time may become long by the area of temp.)

## Operation stop

Please turn OFF ( O ) main SW. Or, please open the input terminal of heater ON/OFF S7-S8. At this time, it is no problem even if the supply of air is stopped simultaneously. But, please defend the following attention.

〈Attention〉 Please do not increase supply air sharply for cooling if operation is stopped in the case that SH31 is used in the neighborhood of the max. temp. Heater insulator is damaged.

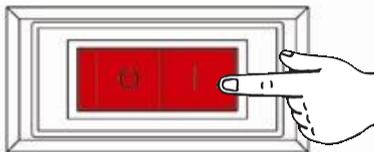
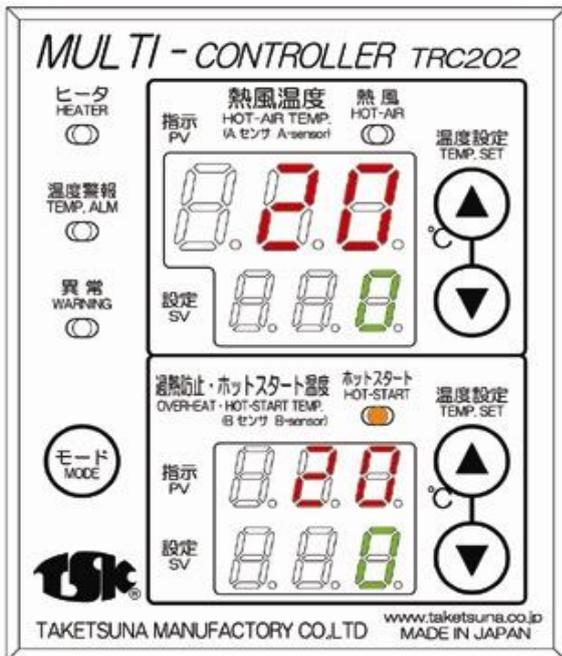
〈Attention〉 The cooling operation is necessary in the case that the outlet of Spot heater is downward from level. Please suspend the supply of air after discharge temp. is cooled to 70C after the main SW was turned off or the input terminal of heater ON/OFF S7-S8 was open.

## 5. Usually operation from Hot-start operation

① Input terminal of the operation mode S5-S6 is close, and input terminal of the heater ON/OFF

③ Please turn ON ( | ) the main SW.

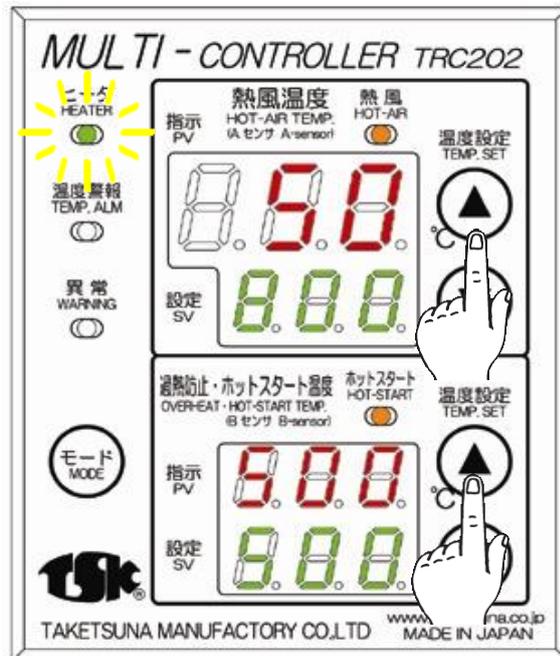
Hot-start lamp (Orange) is lighted and the present temp. is displayed at the hot-air temp. PV display and overheat prevention temp. PV display. And 0 is displayed at the hot-air temp. SV display and hot-start temp. SV display. (First time)



② Please do not supply air at the time of hot-start operation.

④ Please set up hot-air temp. and hot-start temp. by the temp. setting up down key, and close the input terminal of the heater ON/OFF S7-S8.

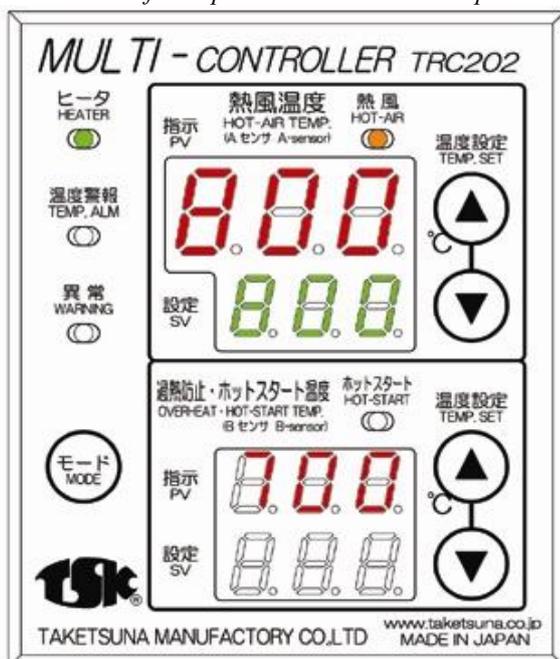
Hot-air lamp (Orange) and heater lamp (Green) are lighted and hot-start operation is started.



※Heater lamp is lighted when the control of hot-start temp. was started.

※Temp. of A-sensor rises a little at the time of hot-start operation because the electricity is flowing to the heater.

⑤ Please supply air to the heater after the input terminal of the operation mode S5-S6 is open.



Hot-start lamp and hot-start temp. SV display are not lighted and usually operation is started.

At this time, the overheat prevention temp. PV display displays the actual temp. of B-sensor because hot-start temp. that was set up is disregarded to change to overheat prevention temp.

※Please supply the air more than min. usable gas capacity without fail.

Please open or close the input terminal of operation mode S5-S6 with the same timing as the stop-supply of air in the case that hot-start operation and usually operation is conducted repeatedly.

• Hot-start operation

Input terminal of operation mode S5-S6 : Close Air stop

• Usually operation

Input terminal of operation mode S5-S6 : Open Air supply

〈Attention〉

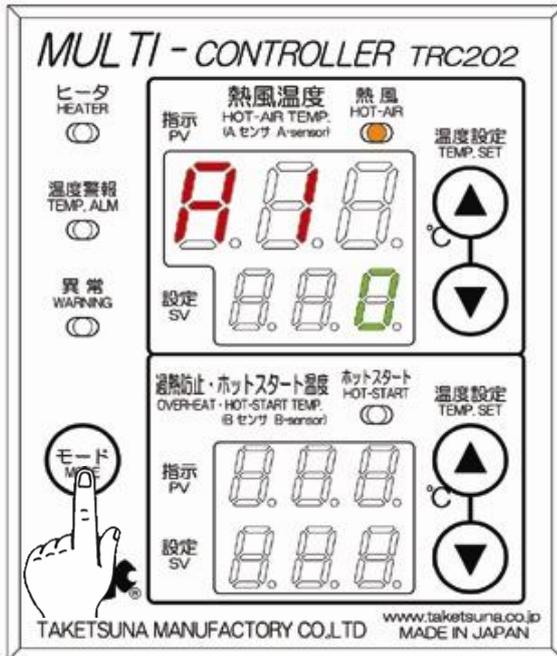
Control of the heater is started by the original overheat prevention function in the case that the temp. of B-sensor is exceeded the temp. of A-sensor more than the regular if the temp. of A-sensor is less than the setting temp. By this function, at first, the time of the temp. rise may be required when the hot-start operation is changed to usually operation.

## 6. In the case that the temp. alam is set up

● Alarm signal is output in the case that hot-air discharge temp. exceeded optional regular range of setting temp. Please use as occasion demands. (This is set up ineffectively at the time of shipment.)

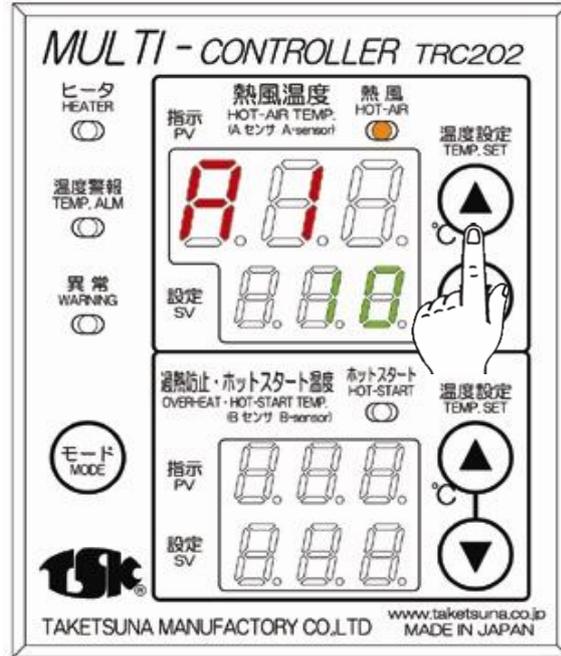
- ① Please continue to push the mode switch during stop, usually operation, or hot-start operation. (About for 2 seconds)

AI is displayed at the hot-air temp. PV display. And 0 is displayed at the hot-air temp. SV display.

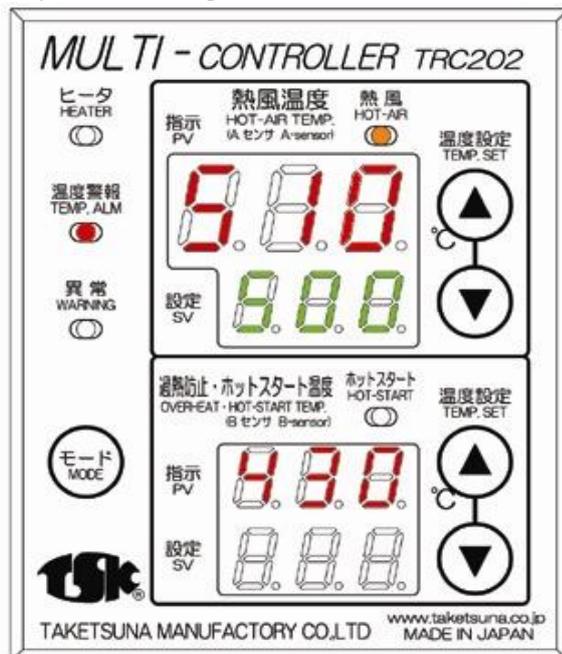


- ② Please set up the optional temp. range by the up down key.

Please return to the display of usually operation by the mode switch is pushed twice after setting.



- ③ Please start usually operation or usually operation from hot-start operation.



Temp. alam lamp (Red) is lighted more than  $+10^{\circ}\text{C}$  and less than  $-10^{\circ}\text{C}$ , and the alam is output from the output terminal of the inside relay contact OUT-COM if the temp. alam was set up to 10. (ON at the alam output : But, only in the case that the temp. alam was selected to the output terminal function.)

※Temp. alam output signal is output as the unvoltage contact signal (Contact capacity is DC30V 1A).

※This controller does not stop by the temp. alam.

※Temp. alam output is ineffective when temp. alam setting is 0.

※Please refer to P.7 about the function setting method of the output terminal of the inside relay contact.

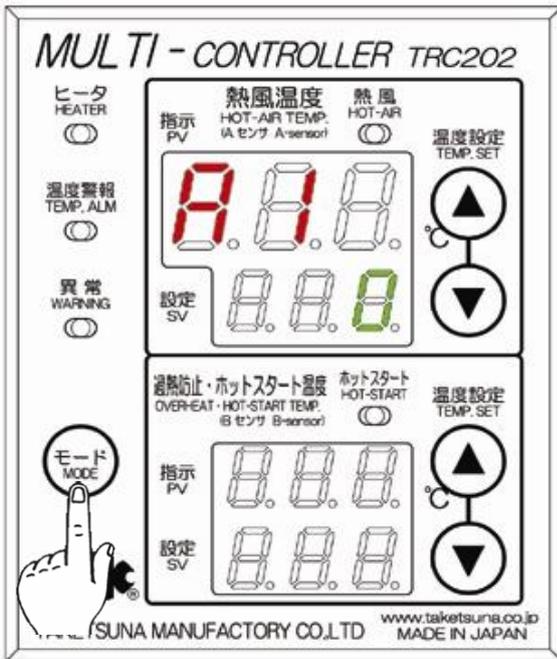
Temp. alam output can select from 10 modes. Temp. alam at the time of the shipment is set up to the top and bottom limit deviation alam with waiting. Please refer to the convenient function of Multi-controller operation manual into our homepage about details in the case that the contents of the temp. alam want to be changed.

## 7. Output terminal function

- Function that is output from the contact output terminal OUT-COM can be selected. Please use as occasion demands. (This is set up the abnormal output at the time of shipment.)

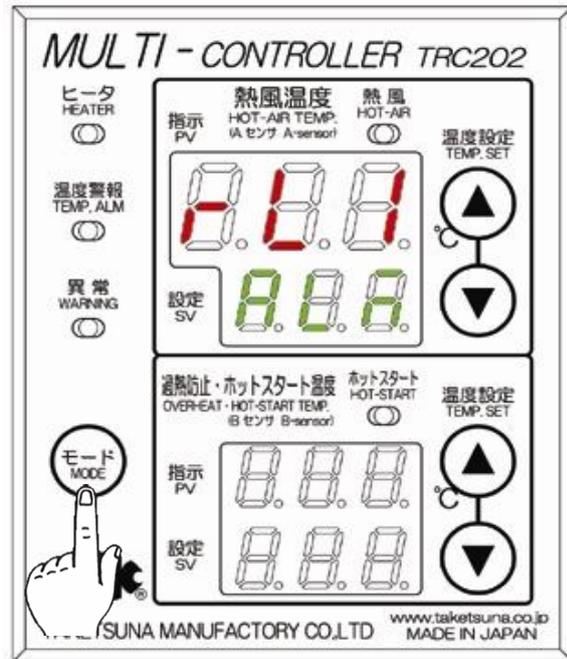
- ①Please continue to push the mode switch (About for 2 seconds) at the time of stop. (S5-S6 : Open, S7-S8 : Open)

A1 is displayed at the hot-air temp. PV display. And 0 is displayed at the hot-air temp. SV display.

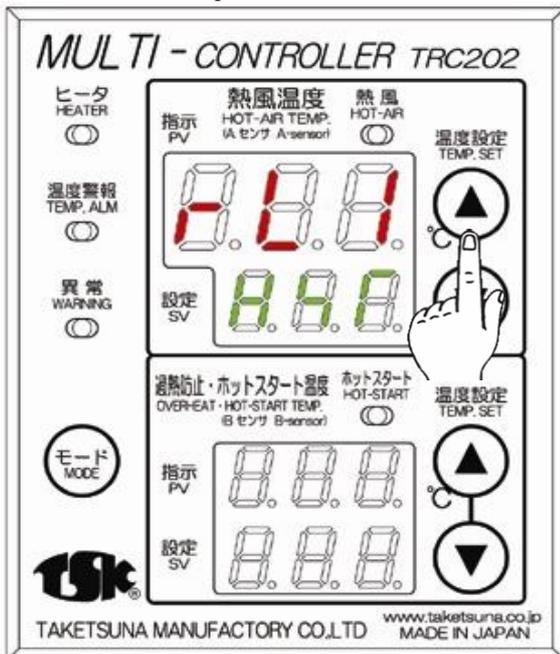


- ②Please push the mode switch 1 time once again.

RL1 is displayed at the hot-air temp. PV display. And ALM is displayed at the hot-air temp. SV display.



- ③Please set up the optional output function by the up down key. And, please start usually operation or usually operation from hot-start operation after the mode switch was pushed 1 time.



	《ALM》 Output at abnormal
	《A1》 Output at the temp. alam
	《AL1》 Output at abnormal and the temp. alam
	《HOT》 Output at usually operation (No output at hot-start operation, stop, and abnormal.)
	《HST》 Output at hot-start operation (No output at usually operation, stop, and abnormal.)

※Abnormal is one of A-sensor temp. warning, B-sensor temp. warning, snapping of a wire of each sensor, reverse connection of each sensor, and inside temp. warning.

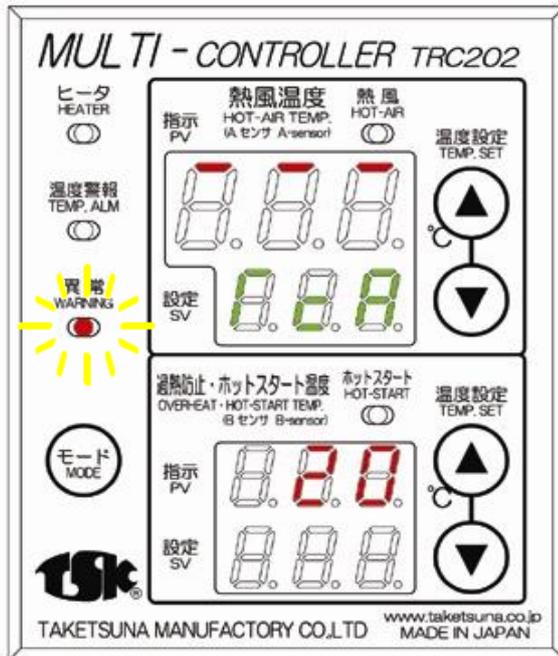
※Terminal of the inside relay contact OUT-COM becomes ON when the function that was selected operated. (Unvoltage contact signal Contact capacity DC30V 1A)

## 8. Each abnormal display

● Each abnormal content are displayed and the heater circuit becomes OFF when Spot heater is abnormality. And, the signal is output from the point of contact output terminal OUT-COM simultaneously (At selecting ALM, AL1). Please resume operation by inputting main SW after the cause is removed without fail.

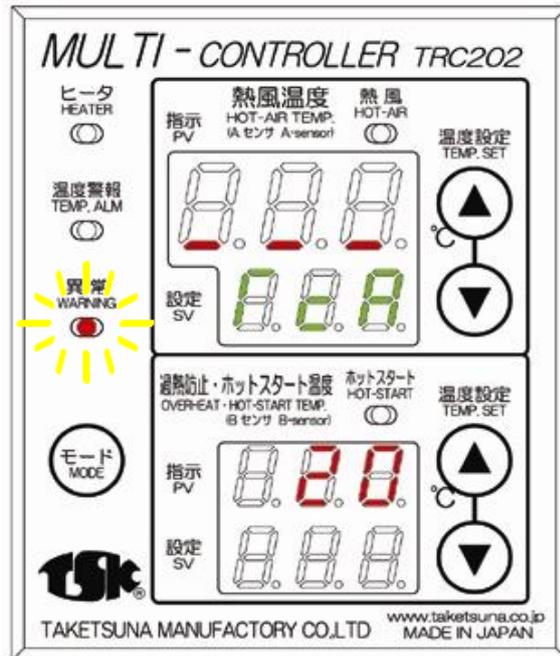
① Snapping of the wire of the A-sensor for detecting the hot-air temp.

Warning lamp (Red) is lighted, and --- is flickered at the hot-air temp. PV display and TCA is flickered at the hot-air temp. SV display in the case that the A-sensor snapped.



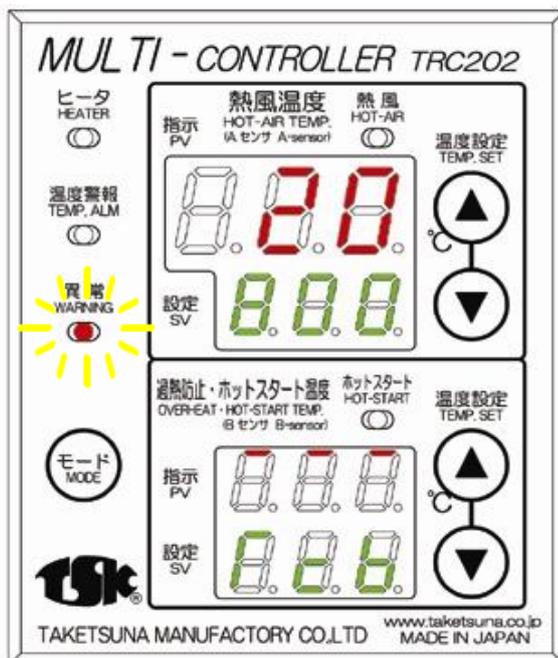
② Reverse connection of the A-sensor for detecting the hot-air temp.

Warning lamp (Red) is lighted, and --- is flickered at the hot-air temp. PV display and TCA is flickered at the hot-air temp. SV display in the case that plus minus of the A-sensor was connected conversely or hot-air discharge temp. is less than -15 °C.



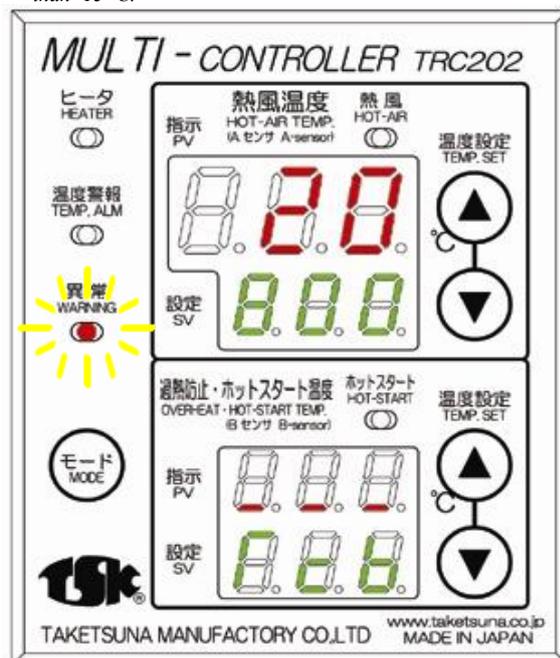
③ Snapping of the wire of the B-sensor for heater snapping of the wire prevention

Warning lamp (Red) is flickered, and --- is flickered at the overheat temp. PV display and TCB is flickered at the hot-start temp. SV display in the case that the B-sensor snapped.



④ Reverse connection of the B-sensor for heater snapping of the wire prevention

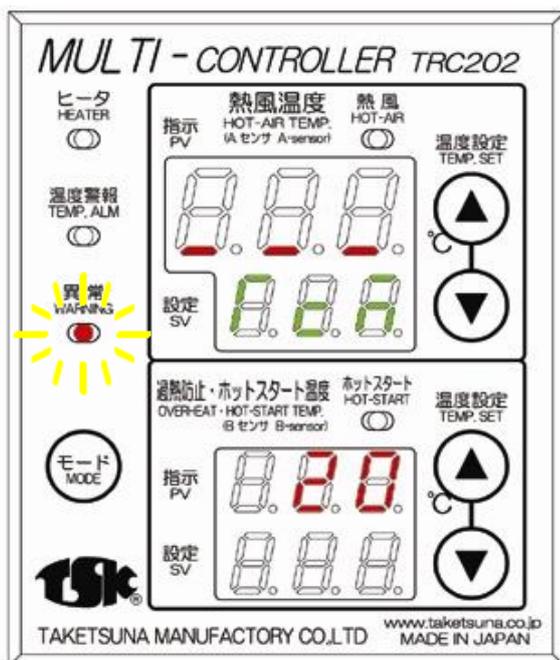
Warning lamp (Red) is flickered, and --- is flickered at the overheat temp. PV display and TCB is flickered at the hot-start temp. SV display in the case that plus minus of the B-sensor was connected conversely or overheat prevention temp. is less than -15 °C.



Attention : Please carry out after the power supply is blocked without fail if the wiring confirmation and readjustment at the abnormal time is conducted.

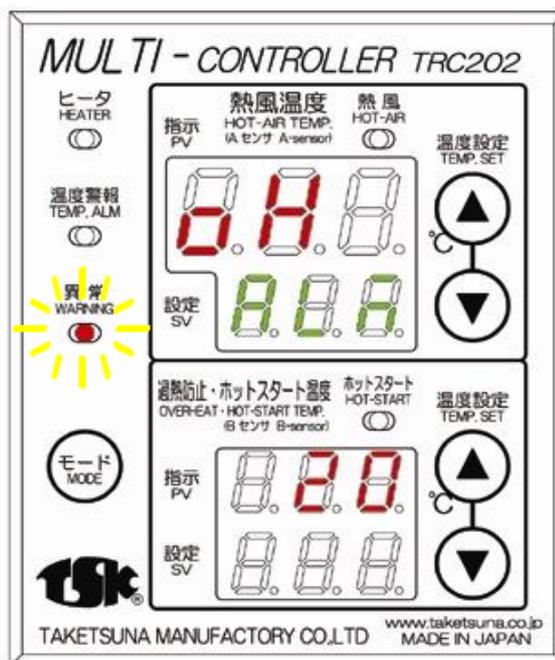
⑤ Inside temp. warning (Low temp.)

Warning lamp (Red) is flickered, and  $\_ \_ \_$  is flickered at the hot-air temp. PV display and TCM is flickered at the hot-air temp. SV display in the case that the inside temp. of Multi-controller became less than  $-5^{\circ}\text{C}$ .



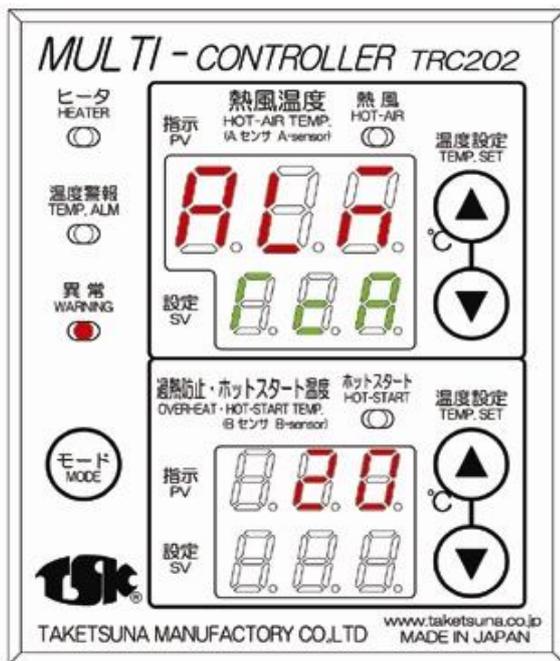
⑥ Inside temp. warning (High temp.)

Warning lamp (Red) is flickered, and OH is flickered at the hot-air temp. PV display and TCM is flickered at the hot-air temp. SV display in the case that the inside temp. of Multi-controller became more than  $65^{\circ}\text{C}$ .



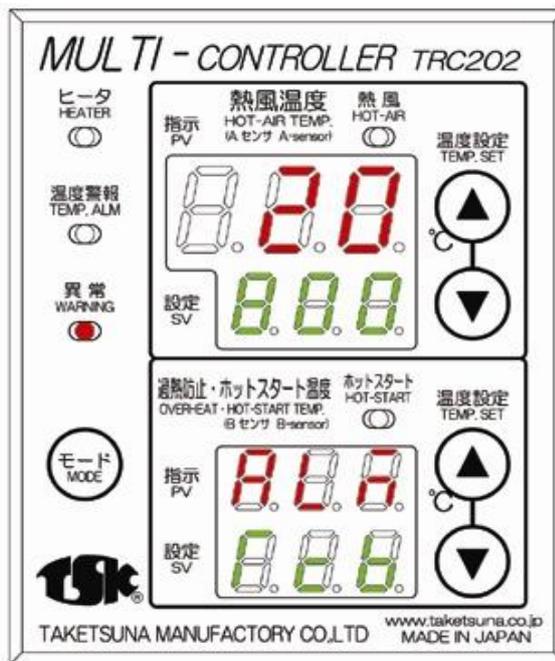
⑦ Temp. warning of A-sensor for detecting the hot-air temp.

Warning lamp (Red) is lighted, and ALM is flickered at the hot-air temp. PV display and TCA is flickered at the hot-air temp. SV display in the case that the hot-air discharge temp. exceeded  $850^{\circ}\text{C}$ .



⑧ Temp. warning of B-sensor for For heater snapping of the wire prevention

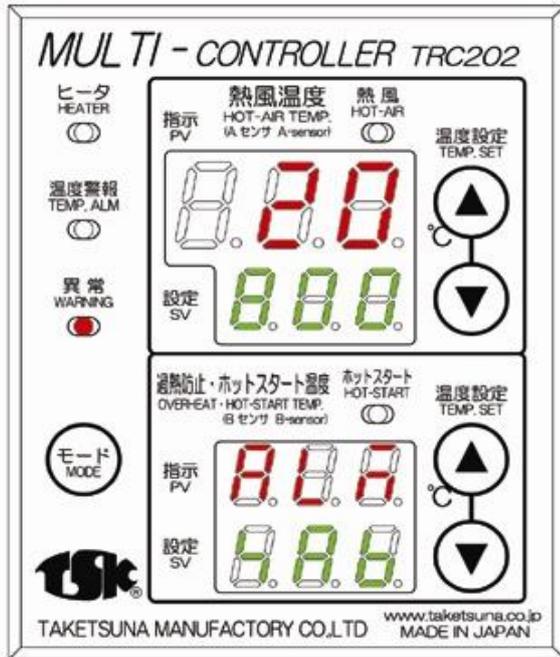
Warning lamp (Red) is lighted, and ALM is flickered at the overheat temp. PV display and TCB is flickered at the hot-start temp. SV display in the case that the overheat prevention temp. exceeded  $750^{\circ}\text{C}$ .



Attention : Please carry out after the power supply is blocked without fail if the wiring confirmation and readjustment at the abnormal time is conducted.

⑨ Temp. restriction of B-sensor for heater snapping of the wire prevention

Warning lamp (Red) is lighted, and ALM is flickered at the overheat temp. PV display and SAB is flickered at the hot-start temp. SV display in the case that overheat prevention temp. exceeded hot-air discharge temp. +80 °C more than for 3 minutes.



※Multi-controller is controlled as the temp. of B-sensor does not exceed the temp. of A-sensor + 80C. Therefore, the discharge temp. may not reach setting temp. by the temp. of B-sensor is controlled if the temp. of B-sensor exceeded the temp. of A-sensor except for in the case that air stopped during hot-air operation suddenly and gas capacity was squeezed sharply.

Attention : Please carry out after the power supply is blocked without fail if the wiring confirmation and readjustment at the abnormal time is conducted.



*Hot-air generator*

*Production  
Sales*



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