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# TP54 Climate Controller



- \* Temperature Sensor 1Set
- \* Humidity Sensor 1Set (Order separately)
- \* 4 Fan Relay Outputs
- \* 1 Cool Relay Output
- \* 1 Spray(OPT) Relay Output
- \* 1 Heat Relay Output
- \* 1 Alarm Relay Output

## TP54 Operation Manual

### Product Warranty & Limitation of Liability

The product warranty is in accordance with the following regulations:

1. The manufacturer should take responsibility for below specific elements:
  - In domestic use (as calculated from the date of invoice):
    - Invoice within one month: Accept replacement and repair.
    - Invoice within twelve months: Accept only repair.
  - Goods exported overseas (excluding Thailand) and invoice within fifteen months, the local seller is responsible for repair.
2. All the distributors, agency or production place of Temp Control in whole Thailand can provide after-sales service for Temp Control product. Their conditions of service as follows:
  - Provide inspection service on the local selling place (including troubleshooting).
  - All services comply with the related after-sale service terms and conditions stated on the agency agreement between Siam Water Flame and distributors.
  - Buyers can pay to any Temp Control agent if need any after-sales services (whether or not the warranty .)
3. The product's warranty period is one year from the date of invoice issued. The product shall be free of defects in materials or workmanship and will be conformed to technical specification.
4. Siam Water Flame will not be responsible for any labor costs or expenses associated with repair and replacement of defective.
5. In the case of the following causes of failure, even in the warranty period, product's repair is also paid:
  - Incorrect operation (without depending on the use of manual), or misuse, alteration, neglect, impropriety, abuse, accident, or unauthorized in maintenance or repair.
  - The problems caused by using the control beyond its standard specifications requirement.
  - Damage caused by drop down or improper handling.
  - Controller components aged or failure caused by improper environment.
  - Due to an earthquake, fire, wind and water disasters, lightning strikes, abnormal voltage, electrical power surge, interruption of electricity, electrical power surge or other natural disasters and other force majeure, which can causes product damage.
  - The damage during transport (Note: The mode of transport designated by the customer, the company's help on behalf of the procedures for handling the transfer of goods).
  - When the manufacture's brand, trademark, serial number, nameplate and other feature damaged or cannot be recognized.
  - The buyer has not completed full payment according to purchase agreement.
  - The installation, wiring, operation, maintenance or other use of objective reality cannot be described to the company's service office.
6. Concerning replacement and repair services, goods shall be returned Temp Control to company. After confirmed the attribution of responsibility, goods are allowed to be returned or repaired.

The user should be aware and alert that something may fail beyond our control exists. Since farm condition and livestock environment may cause controller damage, the user should provide adequate back up and alarm system. These are to operate critical system even in case of Temp Controller system failure.

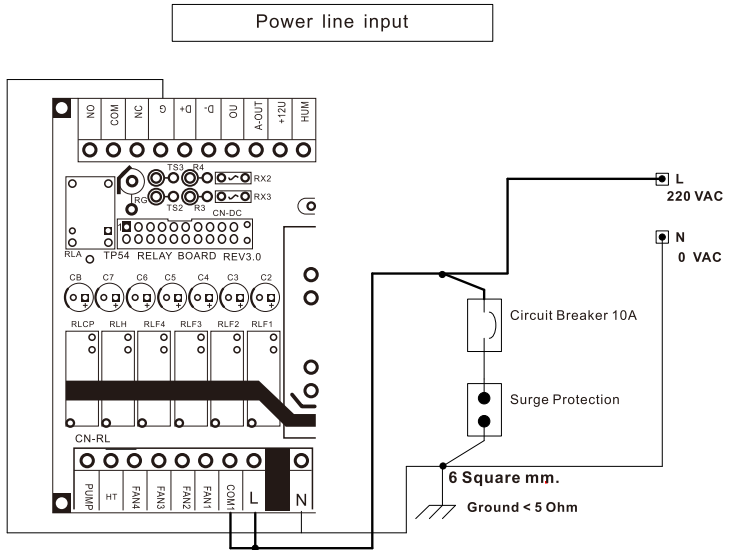
Neglecting to provide such a backup will be regarded as the user's willingness to accept the risk of loss, injury and financial damage. In no event will Siam Water Flame be liable to user or any third party for any direct, indirect, special, consequential or incidental damages, including but not limited to any damage or injury to business earnings, lost profits or goodwill, personal injury, costs of delay, any failure of delivery, costs of lost or damaged data or documentation, lost or damaged products or goods, lost sales, lost orders, lost income. Except of the above express warranty, Siam Water Flame makes no other warranties, express or implied, relating to the products. Siam Water Flame disclaims and excludes the implied warranties of merchantability and fitness for a particular purpose. No person is authorized to make any other warranty or representation concerning the performance of the products other than it is provided by Siam Water Flame.

### Technical Specification

Input Power Voltage	220 10 VAC
Frequency	50-60 Hz
Electric power	9 VA
Fireproofing rate for relay	5A /250VAC
Fireproofing rate for relay alarm	0.5A 250VAC/1A 30VDC
Temperature for using	-20 - 60 °C
Measurement range temperature	-10.0 – 70.0 °C
Accurate value	0.1°C
Deviation value	+/-1%
Measurement range Humidity	0.0 – 99.9%RH
Accurate value	0.1%
Deviation value	+/- 5%

INSTALLATION

1. Connect the TP54 to the wall in a dry place approximately 1 meter away from the electrical cabinet.
2. Connect a 220VAC cable to the L,N connector. This is the unit power input.
3. Connect a protective conductor (P.E.) to the G (Ground) connector. If the earth electrode resistance is more than 5 ohms, change a new earth electrode to connect TP54.



## TP54 Operation Manual

### Analog Input Connections

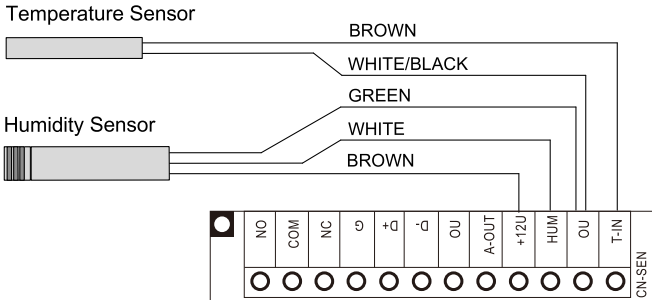
1. Temperature sensors

**T-IN** is used for indoor temperature sensor. Use a two wire cable. Connect one wire to analog input T- IN and second wire to the 0V input.

2. Humidity sensor

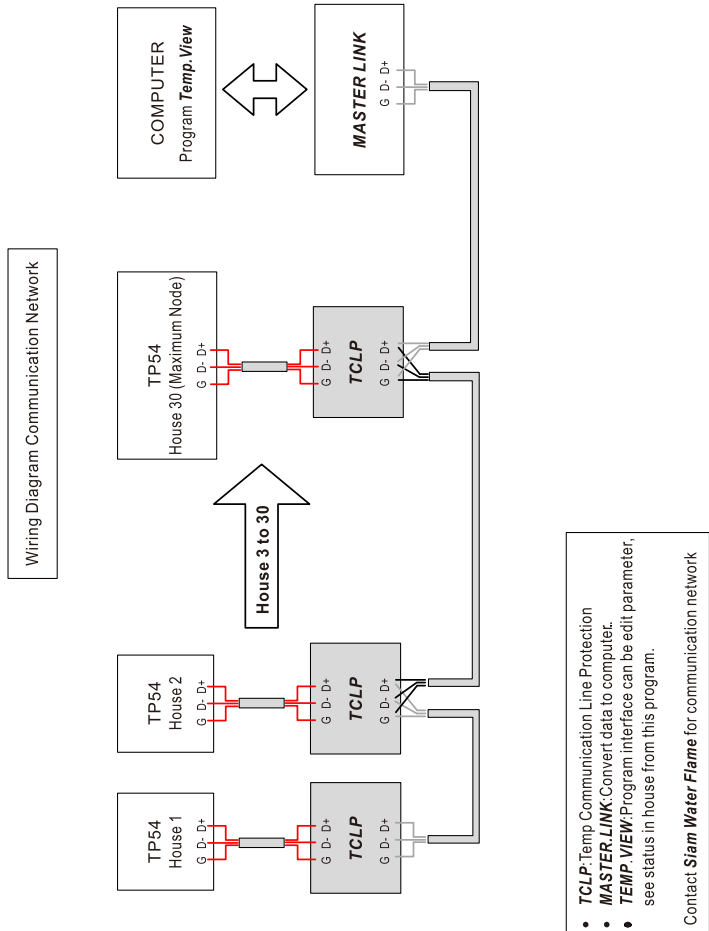
**HUM** is used for indoor humidity sensor. Use a three-wire cable. Brown to input 12V, Green to 0V and White to HUM.

Temp. sensor & Hum. sensor



**Network Connection**

Using RS-485 Cable connect between TP54 and Converter. One wire connects D+ ; another connects D- ; and shield connects G.



## TP54 Operation Manual

### Relay Connections

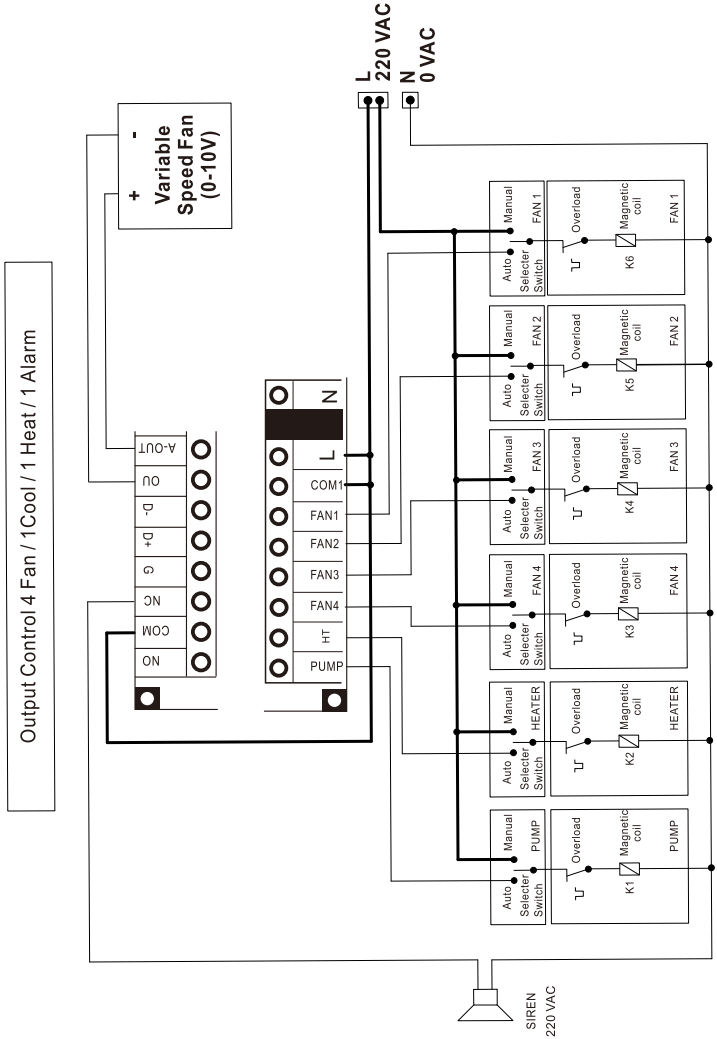
Connect the relay outputs to the various systems. All outputs are dry contact, maximum 3A/250VAC. And connect the relay alarm to the external relay.

#### Relay list

Symbol	Output
FAN1	Fan group 1
FAN2	Fan group 2
FAN3	Fan group 3
FAN4	Fan group 4
PUMP	Cooling pump
HT	Heater
NO/COM/NC	Alarm

### Analog out Connection


A-OUT is used for the variable speed fan (inverter).




### OPERATION

The TP54 will display the temperature and humidity inside the house. The representation will be alternately displayed. If there is no humidity sensor, system will not show the humidity; system will display the temperature inside the house.

### TURN ON POWER

Each time power is connected to the unit "  " will appear on the display. This number is version number, and is unique for this program version.

### CHANGE OF DISPLAY

Push on  button. For select the display.

Press 1 time This is a reading of the current indoor temperature .


Press 2 times This is a reading of the current indoor humidity.( If that is not the use humidity sensor. Displays will show speed fan)

Press 3 times This is a reading of the current speed fan

**NOTE** Press 4 times from now, display panel will show the Alarm status. If errors, it will show these messages .

- |||| Current temperature greater than or equal the specified temperature.
- ||| Current temperature less than or equal the specified temperature.
- |||| Current humidity greater than or equal to the specified humidity.


## MEMORY OF THE TEMPERATURES RECORDED

Push on  button. For select the display.

Press 1 time This is a reading of the maximum temperature recorded.

Press 2 time This is a reading of the minimum temperature recorded.


### NOTE



- Push on  button 5 seconds for clear the temperature recorded.
- TP54 will record data all the time, and clear data when power off.


## CHANGE SET POINT

It is possible to change each set point.

*For instance :*

1. To select the Ventilation function, press button .
2. Panel will show alternately  $\Gamma \Pi I$  and set point of fan 1.

Press button  to increase the set point; or press button  to reduce the set point.

3. Press button  once more, to enter the next setting (Fan2).
4. Press any featured function button to enter its setting model; or press any other function button to exit the current setting model.

## 1. Heater (HEAT)

1.1 H.C.NL Here enter the set point for user's heat requirement, in which the heater will be turned on/off. For instance,

Setting H.C.NL = 25.0°C; H.H.CL = 1.0°C

Heater **on**: temperature : 24.0°C ( H.C.NL - H.H.CL )

**off**: temperature : 25.0°C

(Factory preset of H.H.CL is 1.0°C. It can be edited in technical mode showed 6.13)

## 2. Alarm (ALARM)

2.1 H.H.NL Here set the maximum temperature to activate notification. In case of the controller activates alarm relay, high temperature alarm status will also activate.

2.2 L.NL Here set the minimum temperature to activate notification. In case of the controller activates alarm relay, low temperature alarm status will also activate.


2.3 H.H.LL Here set the maximum humidity to activate notification. In case of the controller activates alarm relay, high humidity alarm status will also activate.

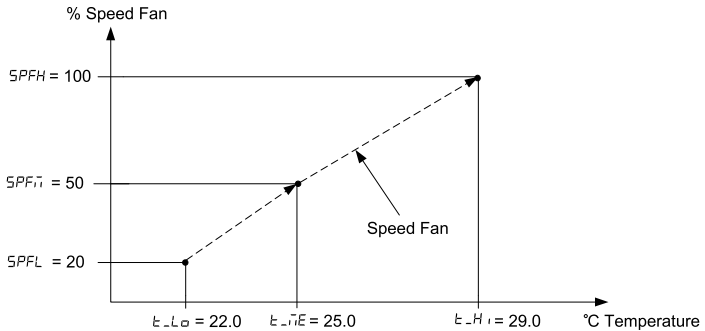
2.4 NL.W Here set the time on period in seconds in which the alarm will run in an on-off cycle.

2.5 NL.G Here set the time off period in seconds in which the alarm relay will be off during the alarm cycle.

### NOTE

- Set NL.G = 0 to disable function alarm run in an on-off cycle.
- When the controller activates the alarm relay, if any button is pressed, alarm relay will delay for 15 minutes (snooze alarm).

**Ventilation (VENT)** 



3.1 SPFL Here enter the minimum speed in percentage (%) in which the variable speed fan will run.

3.2 SPFM Here enter the medium speed in percentage (%) in which the variable speed fan will run.

3.3 SPFH Here enter the maximum speed in percentage (%) in which the variable speed fan will run.

3.4 LLU Here enter the minimum temperature set to control the minimum speed for variable speed fan.

3.5 LLME Here enter the medium temperature set to control the medium speed for variable speedfan.

3.6 LHI Here enter the maximum temperature set to control the maximum speed for variable speedfan.

Example:

$$SPFL = 20\%$$

$$SPFM = 50\%$$

$$SPFH = 100\%$$

$$LLU = 22.0\text{ }^{\circ}\text{C}$$

$$LLME = 25.0\text{ }^{\circ}\text{C}$$

$$LHI = 29.0\text{ }^{\circ}\text{C}$$

As long as the indoor temperature is below 22.0 °C, the variable speed fan will run automatically at 20%.

When the temperature reaches 22.0 °C, the variable speed fan will start to increase speed. When the indoor temperature reaches 29.0 °C, variable speed fan will run automatically at 100. %

**NOTE** : If set  $SPFL = 0$  (see subtopic 6.1) parameter 3.1 – 3.6 will be hidden.

3.7 F<sub>N1</sub> Here enter the set point for user's ventilation requirement, in which the fan1 will be turned on/off. For instance,

Setting  $F_{N1} = 21.0^{\circ}\text{C}$ ;  $\Delta F_{N1} = 1.0^{\circ}\text{C}$

Fan1 on: temperature :  $21.0^{\circ}\text{C}$

off: temperature :  $20.0^{\circ}\text{C} (= F_{N1} - \Delta F_{N1})$

(Factory preset of  $\Delta F_{N1}$  is  $1.0^{\circ}\text{C}$ . It can be edited in subtopic 6.14)

3.8 F<sub>N2</sub> Here enter the temperature in which fan2 will be turned on.

3.9 F<sub>N3</sub> Here enter the temperature in which fan3 will be turned on.

3.10 F<sub>N4</sub> Here enter the temperature in which fan4 will be turned on.

**NOTE** If set 000 (see subtopic 6.3) as F<sub>N1</sub> or 50 mode, here and following will display

- LSP , HP , G , GG (see subtopic 4.1-4.4, Spray Mode)

3.11 F<sub>U</sub> Here enter the time on period in minutes or seconds ( $\times 10$ ) in which the fan will run while the house temperature is below the set point of fan temperature. The fan will run in an on-off cycle.

3.12 F<sub>GF</sub> Here enter the time off period in minutes or seconds ( $\times 10$ ) in which the fan will be turned off during the fan cycle.

3.13 F<sub>NL</sub> Here enter the limit minimum fan operation, Fan will turn on passive the set point turn on fan .

Example: Setting  $F_{N1} = 21.0^{\circ}\text{C}$ ;  $F_{N2} = 22.0^{\circ}\text{C}$ ;  $F_{N3} = 23.0^{\circ}\text{C}$ ;  $F_{N4} = 24.0^{\circ}\text{C}$ ;  $F_{NL} = 2$ ;

Current Temperature =  $19.0^{\circ}\text{C}$

Fan1, Fan2 will turn on and Fan3, Fan4 off.

3.14 F<sub>NH</sub> Here enter the limit maximum fan operation, Fan will close passive the set point turn off fan .

Example: Setting  $F_{N1} = 21.0^{\circ}\text{C}$ ;  $F_{N2} = 22.0^{\circ}\text{C}$ ;  $F_{N3} = 23.0^{\circ}\text{C}$ ;  $F_{N4} = 24.0^{\circ}\text{C}$ ;  $F_{NH} = 2$ ;

Current Temperature =  $25.0^{\circ}\text{C}$

Fan1, Fan2 will turn on and Fan3, Fan4 off.

3.15 F<sub>UL</sub> Here enter the number of fan operate in mode ON/OFF (parameter 3.11 – 3.12)

**4. Spray (SPRAY)** If use Spray mode, user must change mode Fan4 to Spray (see subtopic 6.3)

4.1 **L5P** Here enter the set point for user's spray requirement, in which the spray will be turned on/off based on this set point. For instance,

Setting **L5P** = 27.0°C, **JCP** = 1.0°C

Spray **on**: temperature : 27.0°C

**off**: temperature : 26.0°C (= **L\_D -JCP**)

(Factory preset of **JCP** is 1.0. It can be edited in subtopic 6.15)

4.2 **IHP** Here enter the set point of humidity in which spray will be turned off based on this set point.

For instance,

Setting **IHP** = 80.0%; **JIH** = 2.0

Spray **off**: humidity : 80.0%

**on**: humidity : 78.0% (= **IHP -JIH** )

(Factory preset of **JIH** is 2.0. It can be edited in subtopic 6.16)

4.3 **GU** (Seconds) Here enter the time on period in seconds in which the spray relay will run in an on-off cycle.

4.4 **GO** (Seconds) Here enter the time off period in seconds in which the spray relay will run in an on-off cycle.

**NOTE**

- If there is no humidity sensor or set **IHP** = 0 (see subtopic 6.2) , system will not be used in the humidity control function. **IHP** will be disabled.

**5. Cooling Pump (COOL)**



5.1 **CP** Here enter the set point for user's cooling requirement, in which the cooling pump will be turned on/off based on this set point. For instance,

Setting **CP** = 27.0°C, **JCP** = 1.0°C

Cooling pump **on**: temperature : 27.0°C

**off**: temperature :26.0°C (= **CP -JCP**)

5.2 **HGR** Here enter the set point of humidity in which pump will be turned off based on this set point.

For instance,

Setting **HGR** = 80.0%; **HHS** = 2.0

Cooling Pump **off**: humidity : 80.0%

**on**: humidity : 78.0% (= **HGR** - **HHS** )

(Factory preset of **HHS** is 2.0. It can be edited in subtopic 6.16)






5.3 **CRW** Here set the time period in minutes or seconds ( $\times 10$ ) in which the pump will run in an on-off cycle.

5.4 **CRG** Here set the time period in minutes or seconds ( $\times 10$ ) in which the pump will be turned off during the on-off cycle. (Set "0.0" to disable this function)

**NOTE**

- If there is no humidity sensor or set **HG** = 0 (see subtopic 6.2) , system will not be used in the humidity control function. **HGR** will be disabled

**6. Controller Setup (SETUP)**

- 1) Press button  and  at the same time, then release them until the **C.S.L** displayed. TP54 will turn to Controller Setup mode.
- 2) Press button  to select next parameter.
- 3) Press button  to increase set point, or press button  to reduce the set point within each function. TP54 will automatically save the altering immediately while setting the data.

6.1 **SFC** Enable or disable function speed fan control, when disable this function **all parameter relate which speed fan control will be hidden and output A-OUT not operation.**

- **1** = Enable
- **0** = Disable

6.2 11G Enable or disable any function which use humidity sensor control, when disable this function all function which use humidity sensor control not operation and all parameter relate which humidity will be hidden.

- 1 = Enable
- 0 = Disable

6.3 000 Select mode of output4 (Terminal FAN4), Output4 can be operate in two mode.

- 111 Change output4 to Fan4 mode
- 50 Change output4 to Spray mode

6.4 1111 Set the time on period in minutes and seconds (x10) that the cooling pump system will run once the indoor temperature has reached the required temperature for cooling pump and indoor humidity rises above required humidity. The cooling pump will run in an on-off cycle.

6.5 111G Set the time off period in minute and seconds (x10) that the cooling pump will be off during the cooling pump high humidity cycle.

*NOTE* Set 111G = 00 to disable function high humidity on cooling pump.

6.6 111 Select increase speed fan mode for ventilation. When true condition in mode, Speed fan will increase which (11 + real speed fan). All mode of increase speed fan run in an on-off cycle.

Increase speed fan can be 6 mode.

1. --- (Time) Increase speed by the time, Increase speed all time passive current temperature and humidity
  2. 11 ( High Temperature or High Humidity )Increase speed when temperature is more than or equal to 1-11, or humidity more than or equal to 1111 .
  3. 11 ( Low Temperature or High Humidity )Increase speed when temperature is less than or equal to 1-11 - 0.5, or humidity more than or equal to 1111 .
  4. -11 (High Humidity )Increase speed when humidity is more than or equal to 1111 .
  5. 11- (High Temperature )Increase speed when temperature is more than or equal to 1-11 .
  6. 1- (Low Temperature )Increase speed when the temperature is less than or equal to 1-11 -0.5° .
- 6.7 111 Set the temperature increase fan speed.
- 6.8 11 Set the value to increase fan speed.

## TP54 Operation Manual

- 6.9 UFW Set the time on period in minutes or seconds ( $\times 10$  )
- 6.10 UFG Set the time off period in minutes or seconds ( $\times 10$  )
- NOTE* Set UFG = 0.0 to disable this function increase speed fan.
- 6.11 HHH It is possible to connect the unit to a PC with the help of the “TEMPVIEW” software package.  
It is possible to manage up 99 units. Each controller needs a house number.
- 6.12 ULU Set start time from 3 to 180 seconds to delay the controller operation.
- 6.13 UUL Set the different temperature point of turning on heater.
- 6.14 UFU Set the different temperature point of turning off fan.
- 6.15 UFR Set the different temperature point of turning off cooling pump.
- 6.16 UHU Set the different humidity point of turning off cooling pump.
- 6.17 CUR This is the reading of current indoor temperature. Here it is possible to adjust the temperature reading.
- 6.18 IHO This is the reading of the current indoor humidity. Here it is possible to adjust the humidity.
- 6.19 SCNL Change unit temperature sensor control.
- 0 = Degree Celsius
  - 1 = Degree Fahrenheit
- 6.20 GCL This function is for technician used to reset the controller.
- ↻ = Clear adjust sensor
  - ↺ = Reset all parameter to default.
- 6.21 L This function is for technician used to test relay.
- 6.23 GPR This function is for technician used to test variable speed fan.
- 6.24 QUP This function is for technician used to test 7segments.