

CAUTION:

1. Turn off any electrical devices (e.g. heater, cooler) that are connected to the unit before installation and maintenance.
2. The installer must be a trained personnel.
3. Disconnect the supply before battery replacement.
4. It must be mounted on a dry clean indoor place.

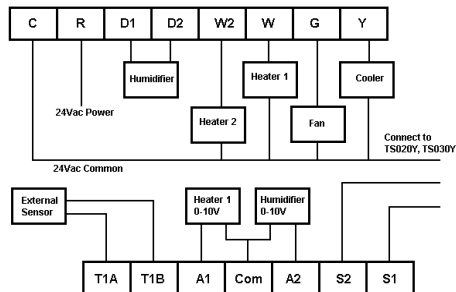
A. Wiring

Terminal Name	Function Description
D1	Humidifier dry contact output for 24Vac (normal open)
D2	
T1A	External temperature sensor
T1B	
S1	Communication data1
S2	Communication data2
A2	0-10Vdc analog output for humidifier
Com	Common ground for analog output
A1	0-10Vdc analog output for heating(Optional for Stage1 analog control heat system "1A", "1A2H", "1A1H")
W	Stage1 heating for 24Vac on/off control (Optional for on/off control heat system "1H2H")
W2	Stage2 heating for 24Vac on/off control (Optional for on/off control heat system "1H2H", "1A2H", "1A1H")
Y	Cooling for 24Vac on/off control
G	Fan for 24Vac on/off control
R	24Vac Power input
C	24Vac Power input common

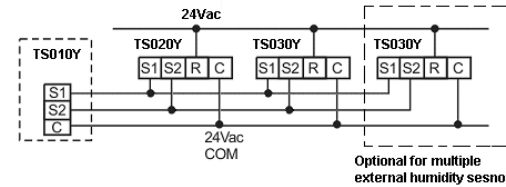
* There are 4 configurations for heat system selection:

1. Stage1 on/off control and Stage2 on/off control – "1H2H"
2. Stage1 analog control and Stage2 on/off control – "1A2H"
3. Stage1 analog control – "1A"
4. Stage1 on/off control and analog control – "1A1H"

Heat system selection is set in the setup mode, see the "B. Setup Mode". Make sure the heat system type to change the selection.



Connection between External CO2 Sensor(TS020Y) and External Humidity Sensor(TS030Y) as the following diagram:



-The details of installation instructions refer to TS020Y and TS030Y user manual.

-The multiple external humidity sensor is optional, the humidity reading is averaging two TS030Y unit's measurement.

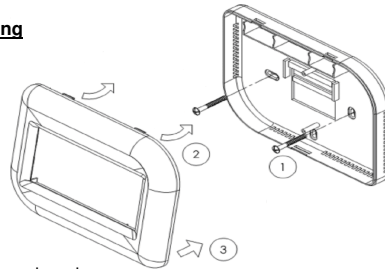
-If the displayed reading is "- ." after powered 30 second, the communication may be failure. Check each unit's connections as above diagram.

Pull all cables back into wall prior to avoid trapping wires.

Do not use metal conduit or of cable provided with a metal sheath.

Recommend adding fuse or protective device in the live circuit.

Mounting



1. Base housing
 - i. Adjust the base on the wall or junction box and ensure the base is at surface level and cover the junction box comfortably.
 - ii. If necessary, pull the cables out at the middle hole of the base.
 - iii. If necessary, place the 2 pcs of wall anchors at the wall.
 - iv. Fasten the base with the 2 pcs of long screws.
 - v. Place the cables at the hole near the terminal block.
2. Hold the thermostat on the base. Align the screw blocks with the pins on the back of the thermostat.
3. Push the thermostat straight onto the base until snaps into place.

B. Setup Mode

There are 10 settings in the setup mode:

1. Calendar
2. 12 / 24 hour selection
3. °C / °F display selection
4. Heat system selection
5. Delay / Long Delay selection
6. HE / HG selection
7. Proportional band, Span and Differential selection for temperature control
8. Proportional band, Span selection for humidity control
9. DST (Daylight Saving Time) Selection
10. Screen lock selection

To enter setup mode, press and hold **SYSTEM** for 5 seconds. In setup mode, press **EXIT** to discard changes made to current setting and exit setup mode. Press **CONFIRM** to apply changes

and proceed to next setting.

Set Calendar

Press **▼ / ▲** to change year, month and day accordingly. Press **CONFIRM** to apply changes and proceed to next setting.

12/24 hour

Press **▼ / ▲** to toggle between 12 and 24 hour mode. Press **CONFIRM** to apply changes and proceed to next setting.

°C / °F selection

Press **▼ / ▲** to toggle between °C or °F temperature unit. Press **CONFIRM** to apply changes and proceed to next setting.

Heat system selection

Press **▼ / ▲** to toggle between control system selection. Press **CONFIRM** to apply changes and proceed to next setting.



Selectable configurations are shown as follow :

Configuration	Display	Terminal Connection
Stage1 on/off & Stage2 on/off	1H2H	W, W2
Stage1 Analog & Stage2 on/off	1A2H	A1, W2
Stage1 Analog	1A	A1
Stage1 on/off & Analog	1A1H	A1, W2

Delay / Long Delay selection

Press **▼ / ▲** to toggle between delay and long delay selection.

Press **CONFIRM** to apply changes and proceed to next setting. Delay for heat / cool on to prevent short cycling of system that may damage the appliance.

"dE" represents delay. "L dE" represents long delay.

	Delay	Long delay
Heat mode	~10 sec	~2 min
Cool mode	4~5 min	4~5 min

HE / HG Selection

Press **▼ / ▲** toggle between HE / HG selection.

Press **CONFIRM** to apply changes and proceed to next setting.

When fan is in auto mode and HE is selected, fan will be turned on as long as heater / cooler is turned on.

When fan is in auto mode and HG is selected, fan will only be turned on during cool mode.

	HE	HG
Heat On	Fan On	Fan Off
Cool On	Fan On	Fan On

Proportional band, Span and Differential selection for Temperature control



"P" represents proportional band setting (for Analog output).

"S" represents span setting(for stage1 on/off).

"d" represents differential setting(for stage2 on/off).

- Press **▼ / ▲** to adjust "S" span is between 1-14. (In

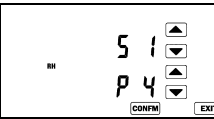
Fahrenheit is represented to 1-14°F, In Celsius is represented to 0.5-7°C).

- Press **▼ / ▲** to adjust "P" Proportional band for AO selection is between 4-14. (In Fahrenheit is represented to 4-14°F, In Celsius is represented to 2-7°C).

- Press **▼ / ▲** to adjust "d" stage differential is between 1-14. (In Fahrenheit is represented to 1-14°F, In Celsius is represented to 0.5-7°C).

Press **CONFIRM** to apply changes and proceed to next setting.

Proportional band, Span selection for Humidity control



"P" represents proportional band setting (for Analog output).

"S" represents span setting(for Dry contact).

Press up/down buttons to adjust "S" span is between 1-3% and "P" Proportional band is 3-6%.

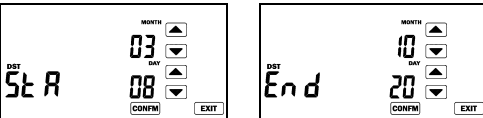
Press **CONFIRM** to apply changes and proceed to next setting.

DST (Daylight Saving Time)

Press **▼ / ▲** to toggle on/off of the DST function.

* The DST used is based on setting of the start date and the end date.

If DST set to On, user is required to enter the start DST date and end DST date.



*The start date and end date cannot set to 29 on February.

Secure lock selection

Press **▼** or **▲** to enable(ON) or disable(OFF) the security lock. If it is enabled, user is required to input a 4-digits password.

Press **▼** or **▲** on the left to change the password. P1 indicates that the 1st digit password (read from left) is selected.

Press **▼** or **▲** on the right to select the digit.

After setting all 4 digits, press **CONFIRM** to activate the security mode.

When security mode is activated, "🔒" is shown on the LCD and all keys are disabled expect **SYSTEM**.

* If the password is 8888, all settings will restore to default upon pressing **CONFIRM**.

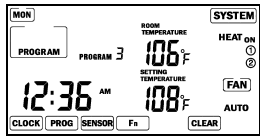
Disable the security lock

1. Press **SYSTEM** and user is required to enter the correct password.

2. If the password is correct, the security lock will be disabled. Otherwise, it remains locked.

* Security Lock cannot be maintained once power is lost.

C. Operations



Normal mode screen

View Calendar

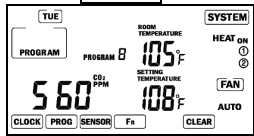
1. Press the current weekday to view current date.
2. Press **EXIT** to exit the viewing.

Clock Setting

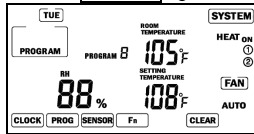
1. Press **CLOCK** to enter the clock setting mode.
2. Firstly, the hour is shown. Press \downarrow or \uparrow to change the hour. Press **CONFIRM** to save the setting.
3. Then, the minute is shown. Press \downarrow or \uparrow to change the minute. Press **CONFIRM** to save the setting and exit clock setting.

View CO2 or Humidity

1. Press **SENSOR** to check the room CO2.



2. Press **SENSOR** again to check the room humidity.



3. Press **SENSOR** back or no press any key for 20 seconds, then back to normal mode.

Usage

The thermostat record the Filter usage. These counters count hourly. Each count is 4 digits long (0~9999). Filter usage counts when the fan is turned on. When the counts reach the set limit, the corresponding usage icon will be shown on the screen.

View Usage

1. Press **Fn** to enter the usage mode.
2. Press **CLEAR** to clear the current counter records.
3. Press **EXIT** to exit the usage mode.

Adjusting Usage limit

1. Press and hold **Fn** for 3 seconds during the usage mode.
2. Press \downarrow or \uparrow to change the internal time (0~9900).
3. Press **CONFIRM** to save the setting.
4. Press **EXIT** to exit the limit setting.

Defrost

When the room temperature is below 5°C / 41°F, HEATER will always be turned ON and COOLER will be turned OFF irrespective of the current control temperature set. 2nd stage heater may be turned on depending on the control system configuration. ❄️ Defrost indicator will be shown on screen.

Clean Screen Mode

1. Press **CLEAR** to enter the cleaning screen mode.
2. The screen will show a 20-second countdown immediately

- after the key press.
3. During countdown, all keys are disabled. When countdown reaches zero, press **EXIT** to exit clean screen mode, or press **CLEAR** to repeat the countdown.

Program mode

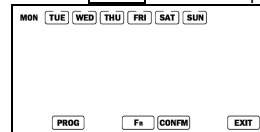
There are 3 type program mode include daily program, set back program, holiday program.

1. Daily program – are 9-time periods programming for each day. The daily program included the start time, program time period, heat set point, cool set point, humidification set point. The program will be running from start time until the end of program time period. Then change to set back program mode.

2. Set back program – is running when the daily program is not activated. It is included the heat set point, cool set point, humidification set point.

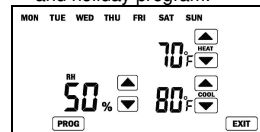
3. Holiday program – is running when a date is matched to the holiday setting. The holiday program included the month, day, heat set point, cool set point, humidification set point. The daily program and set back program are disabled until next day.

1. Press **PROG** to enter the program mode.

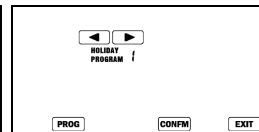


(Daily program screen)

2. Press **PROG** to select the daily program, set back program and holiday program.



(Set back program screen)



(Holiday program screen)

3. Press **EXIT** to exit program setting.

Daily program

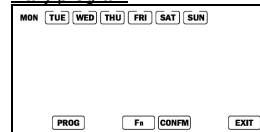


Fig1.

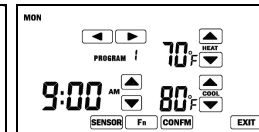


Fig2.

1. Press left/right keys to select the time zone for program 1 to 9.
2. Press weekday to select the program day. Selected weekdays will have no \square surrounded(see Fig1).
3. Press **CONFIRM** to review or update the program.
4. Or Press **Fn** to copy the program (see step 10).
5. Press \downarrow or \uparrow to change the time, heat or cool setting temperature and the program periods 1 to 6(see Fig2).
6. Press **SENSOR** to change the program time to humidity set point, press up/down buttons to adjust the set point(see Fig3).

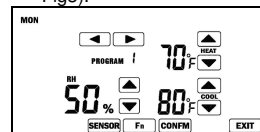


Fig3.

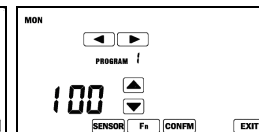


Fig4.

7. Press **Fn** to change the program period, press up/down buttons to adjust the time period from 10-500 minute (see Fig4).
8. Press **EXIT** to discard any changes and exit program setting.
9. Press **CONFIRM** to save settings and select another day to set the program.
10. If Press **Fn** to copy mode, the selected day disappear and show another weekday keys.
11. Press other weekday with \square which you want to copy the program to the days. Selected weekdays will have no \square surrounded(see Fig5).



Fig5.

12. Press **EXIT** to discard any changes and exit copy mode.
13. Press **CONFIRM** to process the copy and exit copy mode.

Default programs are as the below:

	Mon - Sun	Heat	Cool	Humidity	Period time
Program 1	9:00	75°F/24°C	80°F/26.5°C	50%	50min
Program 2	10:00	75°F/24°C	80°F/26.5°C	50%	50min
Program 3	11:00	75°F/24°C	80°F/26.5°C	50%	50min
Program 4	12:00	75°F/24°C	80°F/26.5°C	50%	50min
Program 5	13:00	75°F/24°C	80°F/26.5°C	50%	50min
Program 6	14:00	75°F/24°C	80°F/26.5°C	50%	50min
Program 7	15:00	75°F/24°C	80°F/26.5°C	50%	50min
Program 8	16:00	75°F/24°C	80°F/26.5°C	50%	50min
Program 9	17:00	60°F/15.5°C	90°F/32°C	50%	50min

Set back program

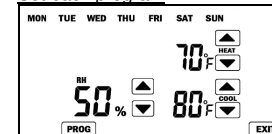


Fig6.

1. In program mode, Press **PROG** enter to Set back program(see Fig6).
2. Press \downarrow or \uparrow to change the humidity, heat or cool set point.
3. Press **PROG** accept changes and enter to holiday program selection.
4. Press **EXIT** to back to normal mode.

Holiday program

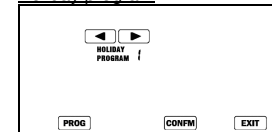


Fig7.

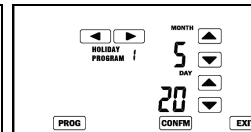


Fig8.

1. In program mode, Press **PROG** enter to Holiday program(see Fig7).
2. Press left/right buttons to change the holiday program 1 to 3.
3. Press **CONFIRM** to review or update the program.
4. Press \downarrow / \uparrow to adjust the month and day.
5. Press **CONFIRM** to set the heat, cool and humidity for holiday

- program, Press \downarrow or \uparrow to adjust the set points.
6. Press **CONFIRM** accept changes and returns to holiday program select.
7. Press **EXIT** to discards any changes and back.
 - * The holiday program date cannot set to 29 on February.
 - * If the holiday program are set same date, the lower program number is high priority to activate.

Override mode

1. Press **PERMANENT OVERRIDE PROGRAM** to select permanent override, temporary override and program.
2. Default override heat set point is 21°C / 70°F, cool set point is 26.5°C / 80°F and humidity set point is 60%.
3. Press \downarrow / \uparrow to change the override setting temperature in heat and cool mode respectively.
4. If the override humidity set point is not shown, press **PERMANENT OVERRIDE PROGRAM**. Temporary override mode returns to normal mode when new program starts if override time does not set.

System setting

In Normal mode, press and release **SYSTEM** to enter system mode.

User may set the system used by pressing **SYSTEM**. It follows the sequence below:

HEAT → COOL → OFF → HEAT	
HEAT MODE	Heating appliances will be activated when the room temperature is lower than the setting temperature.
COOL MODE	Cooling appliances will be activated when the room temperature is higher than the setting temperature.
OFF MODE	No heating and Cooling will be activated at any temperature.

“LO” will be shown on the screen when room temperature is below 0°C / 32°F.

“HI” will be shown on the screen when room temperature is above 60°C / 131°F.

When one appliance is turned on, ① will be shown on the screen as indication. Similarly, ② will be shown on the screen when second appliance is turned on.

FAN mode

Press **FAN** to enter fan mode. In the fan mode, press **FAN** to toggle the Fan controls (FAN ON or FAN AUTO). In program mode, The fan setting will auto change to FAN AUTO when entry to setback periods. The fan setting will auto change to FAN ON when entry to occupied periods. * Definition of occupied periods is daily program ON period, excepted the holiday program and override modes.

FAN ON: Fan stays on all the time.
FAN AUTO: Fan turns on whenever humidifier, heating or Cooling is on (Depends on HE/HG setting).

D. Electrical specification

Power Supply:	24Vac ±15% 50/60Hz
Temperature measurement:	0~60°C / 32~140°F
Control temperature range:	5~55°C / 41~131°F
Control humidifier range:	30-90% RH
Temperature resolution:	0.5°C / 1°F
Temperature accuracy:	±0.5°C / ±1°F
Relay contact Voltage:	24Vac 50/60Hz
Relay contact Current:	1Amp Max.
Operating temperature	0~55°C