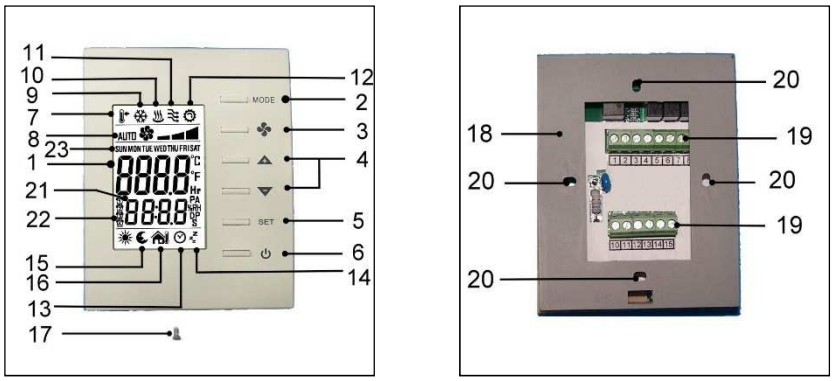
TBMPx700-H-OC Series

Modbus Programmable Temperature Controllers

With Humidity Display and Optional Modulating Fan Control

OPERATION MANUAL

Front view **Back view**



#	Item	Description
1	LCD	Display temperature and working status.
2	MODE button	Access to user and engineer menu and for setting confirmation or change ℃/℉ unit if press for over 3 sec.
3	FAN button	Toggle to change Fan Lo/M/Hi speed in continuous mod
4	UP & DOWN buttons	Increase & decrease setting or previous/next item
5	SET button	Set for date/time and programmable Schedules
6	On/Off button	Turn on/ off thermostat
7	Set-point icons	Display set-point temperature while it is shown
8	Fan icons	Indicate Fan status
9	Flake icon	Indicate working on Cooling mode
10	Hot spring icon	Indicate working on Heating mode
11	Flow icon	Indicate working on ventilating mode
12	Working icon	Indicate Valve/actuator ON
13	Clock	Not used
14	Sleep	Sleep mode is enable while it is shown
15	Moon icon Sun icon	Indicate room unoccupied Indicate general alarm status ON
16	Outdoor icon	Indicate door/ window open
17	Cover screw	Screw to tighten back cover with front cover
18	Back plate	Plate for mounting on electric box
19	Wiring terminal blocks	Terminals for wiring
20	Mounting holes	Holes for mounting on electric box
21	Small 8888 A,P,DP	Small 8888: Display time or humidity A: am P: pm DP: dew point temperature
22	Schedule number	Current Schedule running or setting
23	Day	Current day of Sunday ~ Saturday or setting

Installation

Mounting on electric box

1. Separate back plate from the controller by loosing the cover screw;
2. Align the mounting holes on the screw holes of the electric box(applicable to 65x65 or US standard box);
3. Fix the back plate on the electric box by tightening the back plate screws. Suggest to use Philips wider “truss head” or

"washer head" #6-32x 3/4"(20mm).

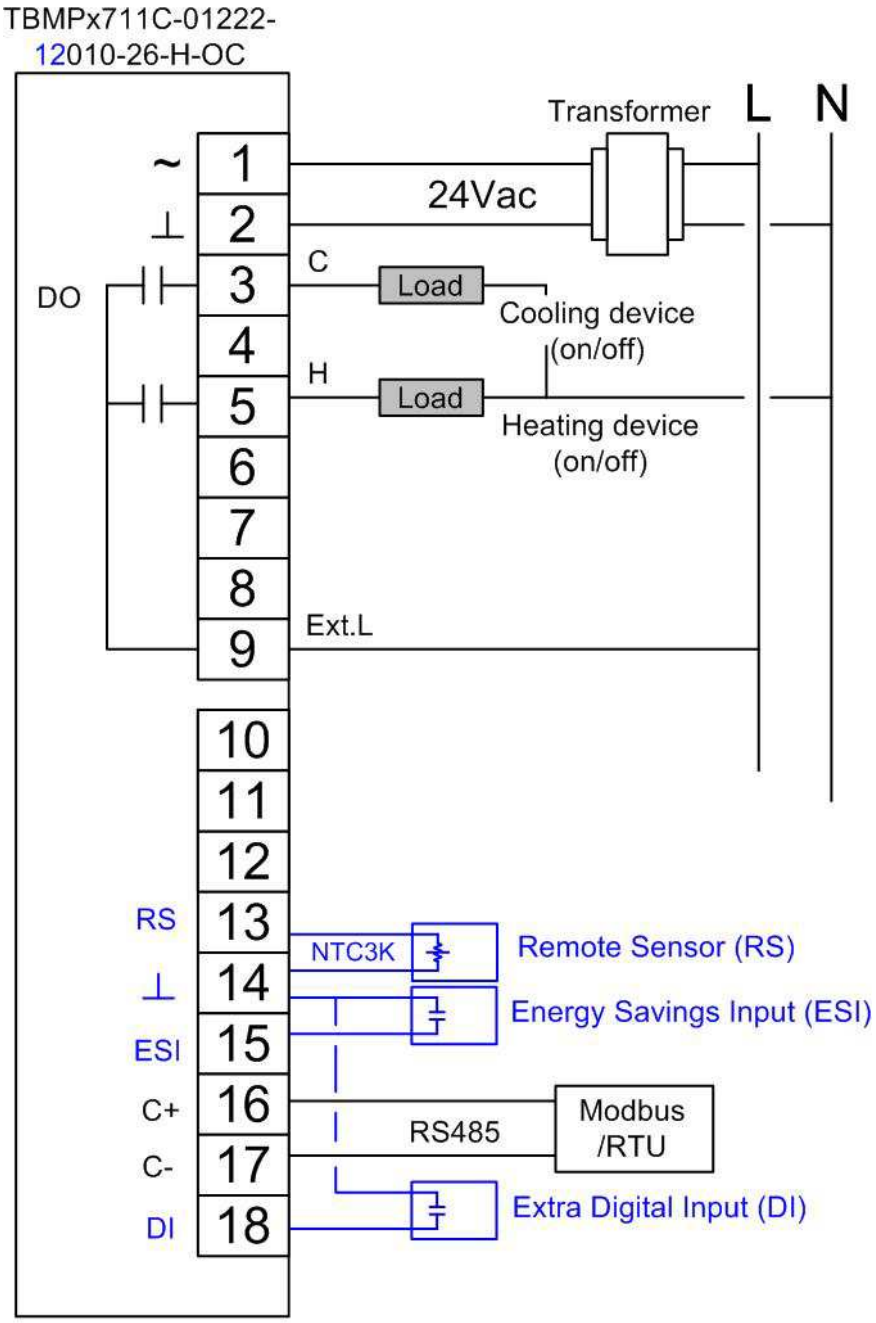
4. DO NOT let the bolt head rise above the wall of mounting holes of back plate. It might cause the short circuit of the controller.

Mounting front cover

1. Lock front cover on the back plate by tightening the cover screw underneath with screw driver of Philip electronic instrument type or similar.

Wiring Example

1. All wires come from electric box must be inserted above the retainers of respective terminal block before tightening the captive screws;



Wiring Diagram for
TBMPx711C-01222-12010-26-H-OC
Thermostat

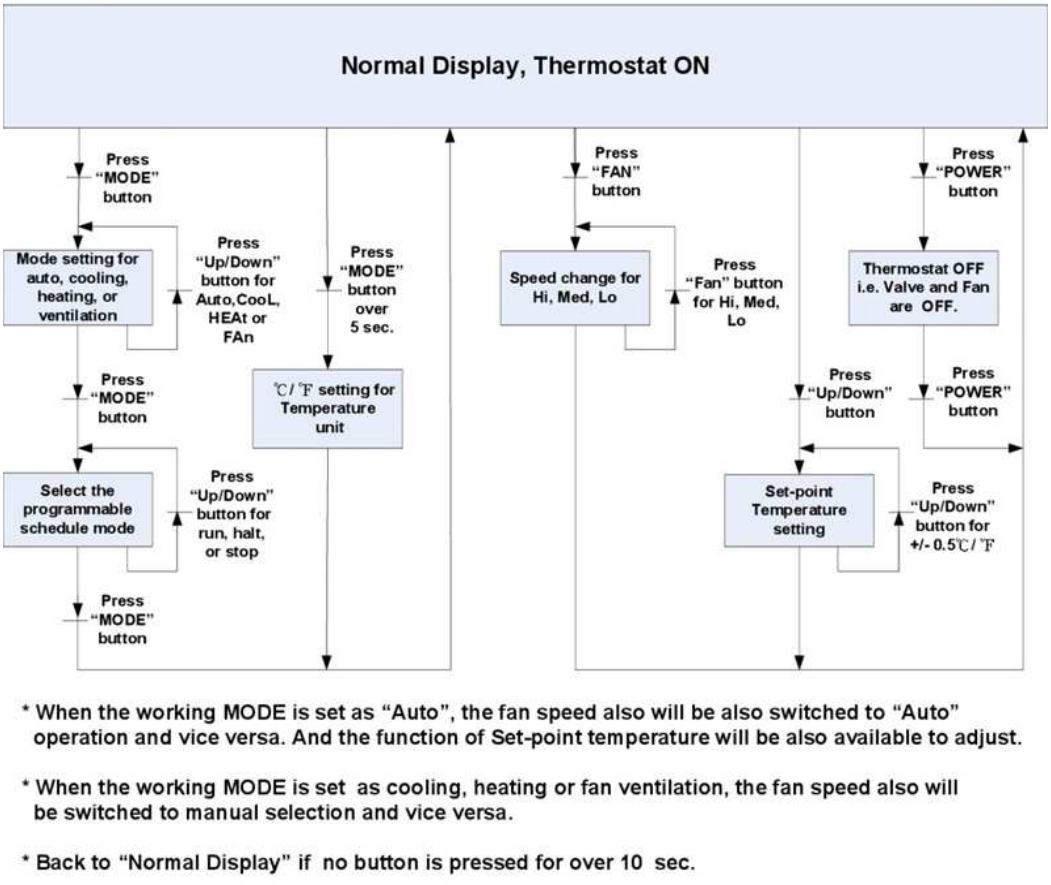
Operation

User Mode Operation

The first tier of operation includes the following settings as Figure 2. To operate:

1. Power switch “ON” or “OFF” to start/ stop the control;
2. At switch “ON”, press any button to start the User Mode operation. Press “MODE” button to switch over different schedule modes. Press UP/ DOWN button to increase/ decrease or rotate the values of setting. Press “FAN” button to toggle over different fan modes. Press “MODE” button for more than 3 seconds, the unit of temperature will toggle to change to ℉ or ℃.
3. It will return to normal display with the latest setting if there’s no button pressed for 10 seconds.

#	Item	Description	Remarks
1	Normal Display	Display current room or set-point temperature	Setting “-SP-“ parameter in Engineer table to choose Current room or Set-point temperature.
2	Temperature Setting	Set the required temperature	
3	Mode Select MODE	1. Select the working mode: Auto(AUTO), Cooling ( ), Heating ( ), or Fan( ). 2. Select the programmable schedule mode: run, HALt, or StOP 3. Press “MODE” button for more than 3 seconds, the unit of temperature will change to ℉ (or ℃).	RUN means Running on Schedules. HALT means temporarily using manual S.P instead of “current” Schedule. STOP means using manual S.P instead of “all” Schedules.
4	Fan Auto/ Continuous	Change Fan mode for continuous Low/Med/Hi speed.	Only applied to models with fan speed control.



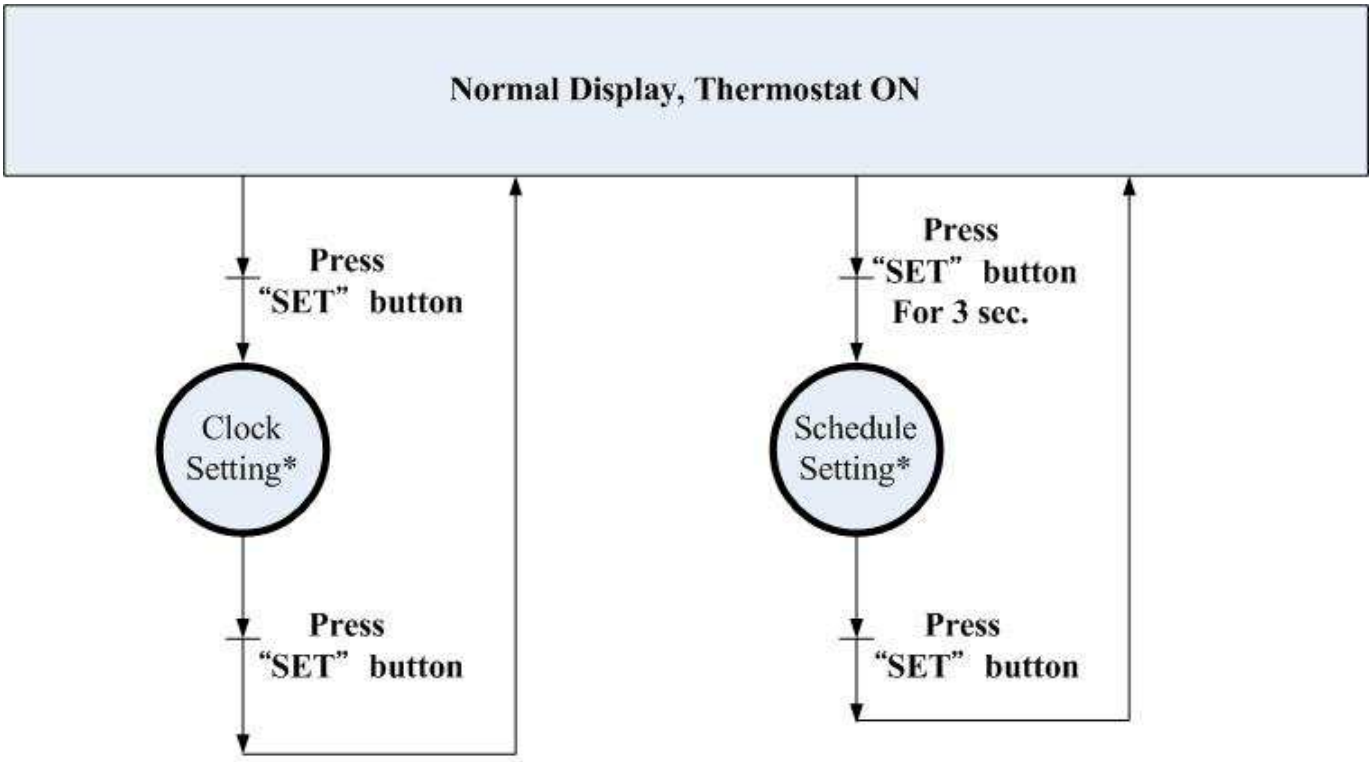
* When the working MODE is set as “Auto”, the fan speed also will be also switched to “Auto” operation and vice versa. And the function of Set-point temperature will be also available to adjust.

* When the working MODE is set as cooling, heating or fan ventilation, the fan speed also will be switched to manual selection and vice versa.

* Back to “Normal Display” if no button is pressed for over 10 sec.

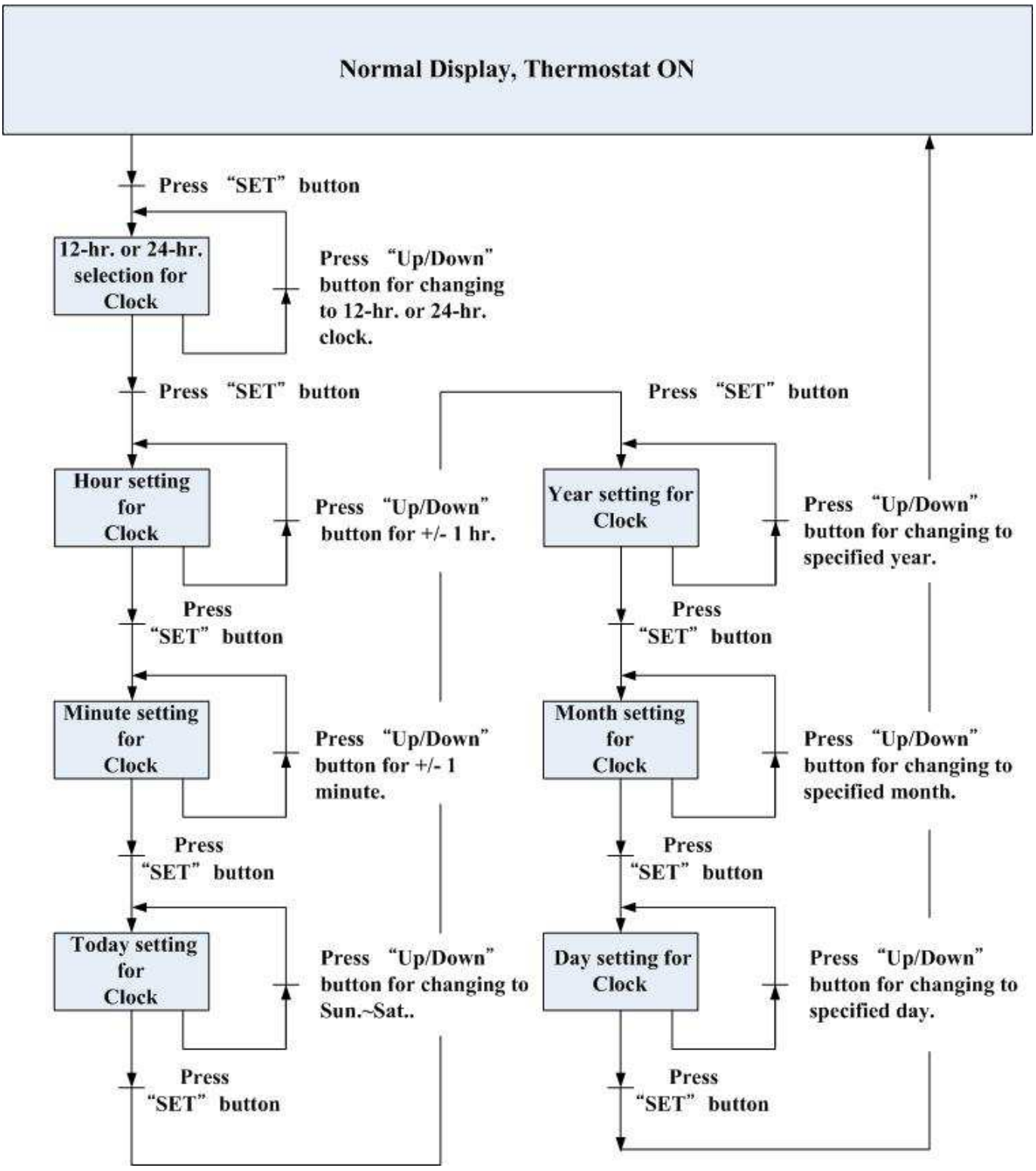
Fig. 2 User Mode operation sequence

Overview for the settings of Clock and programmable Schedules

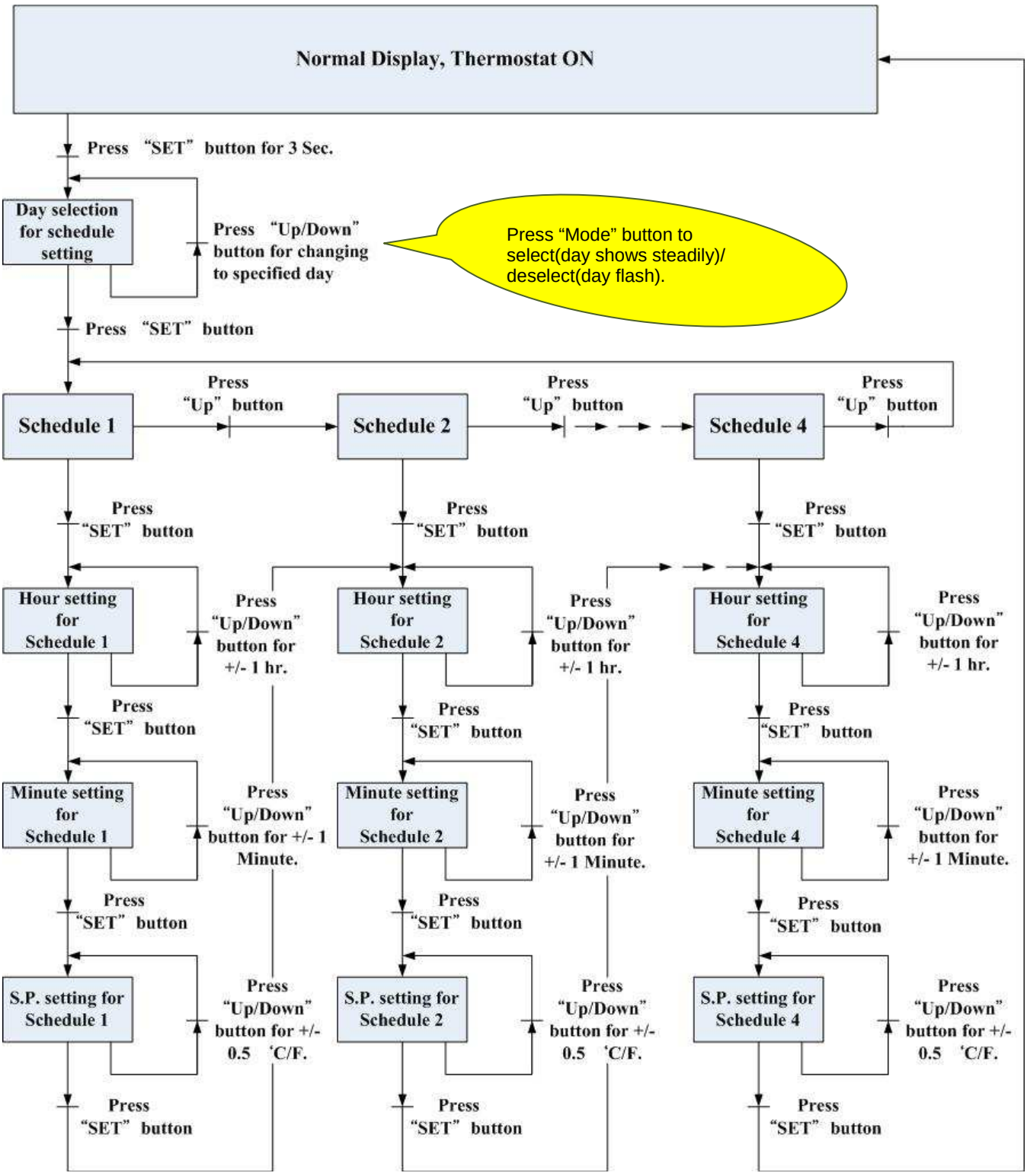


* Please refer to its related detailed state diagram respectively for details.

1. Detailed State Diagram for Clock Setting



2. Detailed State Diagram for Programmable Schedule Setting



Examples of Setting Tables for Programmable Schedules

1. For the types of a.) Cooling control only, or b.) Cooling **&** Heating control, auto-changeover type, the Set-point temperatures for each schedule will be like as this table (Ex.: if wants 6:00 26℃, 8:00 29.5℃, 18:00 26℃, and 22:00 26℃ every day):

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Sch. 1 ①	6:00 Cool:26.0℃	6:00 Cool:26.0℃	6:00 Cool:26.0℃	6:00 Cool:26.0℃	6:00 Cool:26.0℃	6:00 Cool:26.0℃	6:00 Cool:26.0℃
Sch. 2 ②	8:00 Cool:29.5℃	8:00 Cool:29.5℃	8:00 Cool:29.5℃	8:00 Cool:29.5℃	8:00 Cool:29.5℃	8:00 Cool:29.5℃	8:00 Cool:29.5℃
Sch. 3 ③	18:00 Cool:26.0℃	18:00 Cool:26.0℃	18:00 Cool:26.0℃	18:00 Cool:26.0℃	18:00 Cool:26.0℃	18:00 Cool:26.0℃	18:00 Cool:26.0℃
Sch. 4 ④	22:00 Cool:26.0℃	22:00 Cool:26.0℃	22:00 Cool:26.0℃	22:00 Cool:26.0℃	22:00 Cool:26.0℃	22:00 Cool:26.0℃	22:00 Cool:26.0℃

Note: For the type of cooling control only and the type of cooling & heating control, auto-changeover, the cooling set-point needs to be set, but the heating set-point is automatically set as “Cooling set-point minus Deadband”. For example, if cooling set-point is 26℃ and Deadband is 4℃, thus, the heating set-point will be set as 22℃ automatically.

2. For the types of Cooling or Heating control, manual-changeover, the Set-point temperatures for each schedule will be like as this table (Ex.: if wants 6:00 26℃/19℃, 8:00 29℃/21℃, 18:00 26℃/19℃, and 22:00 28℃/20℃ every day):

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Sch. 1 ①	6:00 Cool:26.0℃ Heat:21.0℃	6:00 Cool:26.0℃ Heat:21.0℃	6:00 Cool:26.0℃ Heat:21.0℃	6:00 Cool:26.0℃ Heat:21.0℃	6:00 Cool:26.0℃ Heat:21.0℃	6:00 Cool:26.0℃ Heat:21.0℃	6:00 Cool:26.0℃ Heat:21.0℃
Sch. 2 ②	8:00 Cool:29.5℃ Heat:16.5℃	8:00 Cool:29.5℃ Heat:16.5℃	8:00 Cool:29.5℃ Heat:16.5℃	8:00 Cool:29.5℃ Heat:16.5℃	8:00 Cool:29.5℃ Heat:16.5℃	8:00 Cool:29.5℃ Heat:16.5℃	8:00 Cool:29.5℃ Heat:16.5℃
Sch. 3 ③	18:00 Cool:26.0℃ Heat:21.0℃	18:00 Cool:26.0℃ Heat:21.0℃	18:00 Cool:26.0℃ Heat:21.0℃	18:00 Cool:26.0℃ Heat:21.0℃	18:00 Cool:26.0℃ Heat:21.0℃	18:00 Cool:26.0℃ Heat:21.0℃	18:00 Cool:26.0℃ Heat:21.0℃
Sch. 4 ④	22:00 Cool:26.0℃ Heat:16.5℃	22:00 Cool:26.0℃ Heat:16.5℃	22:00 Cool:26.0℃ Heat:16.5℃	22:00 Cool:26.0℃ Heat:16.5℃	22:00 Cool:26.0℃ Heat:16.5℃	22:00 Cool:26.0℃ Heat:16.5℃	22:00 Cool:26.0℃ Heat:16.5℃

Note: For the type of Cooling or Heating control, manually-changeover, the cooling and the heating set-points need to be set separately. And manually set “Cooling” set-point temperature only when thermostat works at Cooling mode. i.e. When Thermostat works at Heating mode, users are not able to adjust set-point temperature for Cooling. The same, manually set “Heating” set-point temperature only when thermostat works at Heating mode.

P.S.: The icon ①, ②, ③, or ④ will be shown on LCD steadily while the programmable Schedule 1,2,3, or 4 is running.

Example of Setting Table for Timers

2. Table of On/Off event for each Timer will be like this (Ex.: if wants 9:00 ON, 12:00 OFF, 14:00 ON, and 18:00 OFF every day):

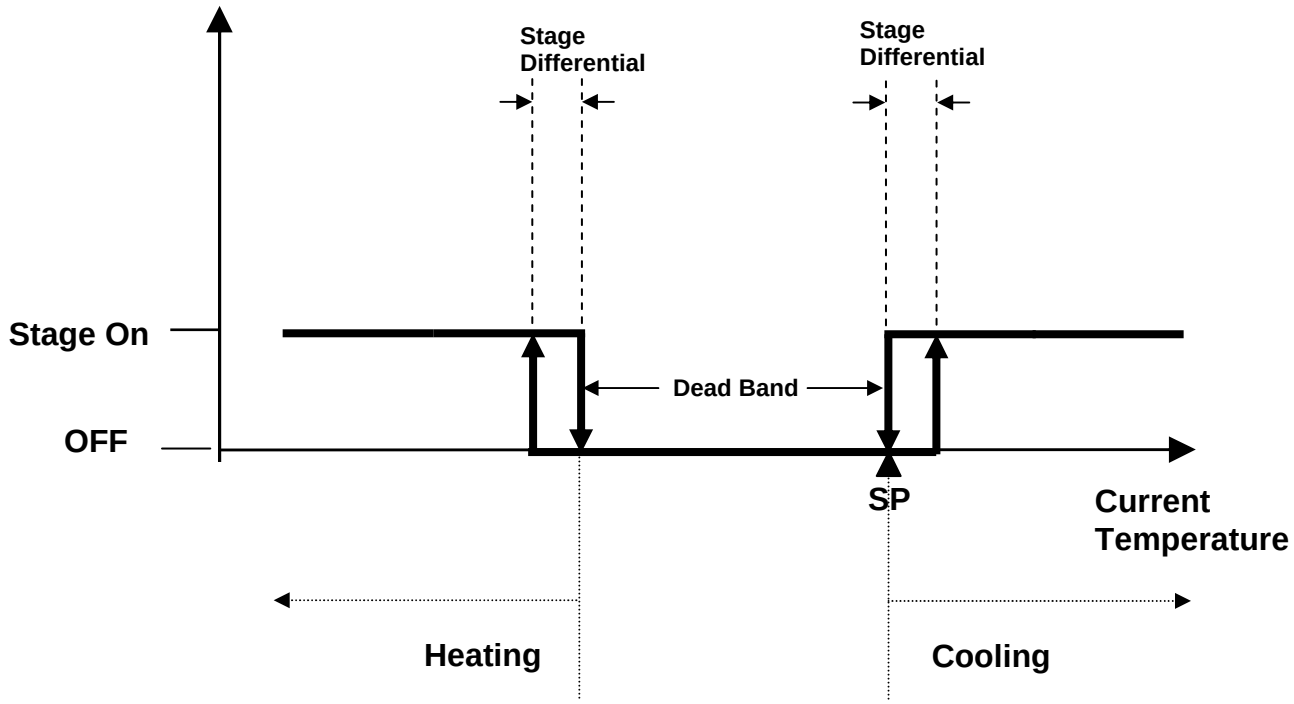
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Timer 1	9:00 ON	9:00 ON	9:00 ON	9:00 ON	9:00 ON	9:00 ON	9:00 ON
Timer 2	12:00 OFF	12:00 OFF	12:00 OFF	12:00 OFF	12:00 OFF	12:00 OFF	12:00 OFF
Timer 3	14:00 ON	14:00 ON	14:00 ON	14:00 ON	14:00 ON	14:00 ON	14:00 ON
Timer 4	18:00 OFF	18:00 OFF	18:00 OFF	18:00 OFF	18:00 OFF	18:00 OFF	18:00 OFF

Control Action

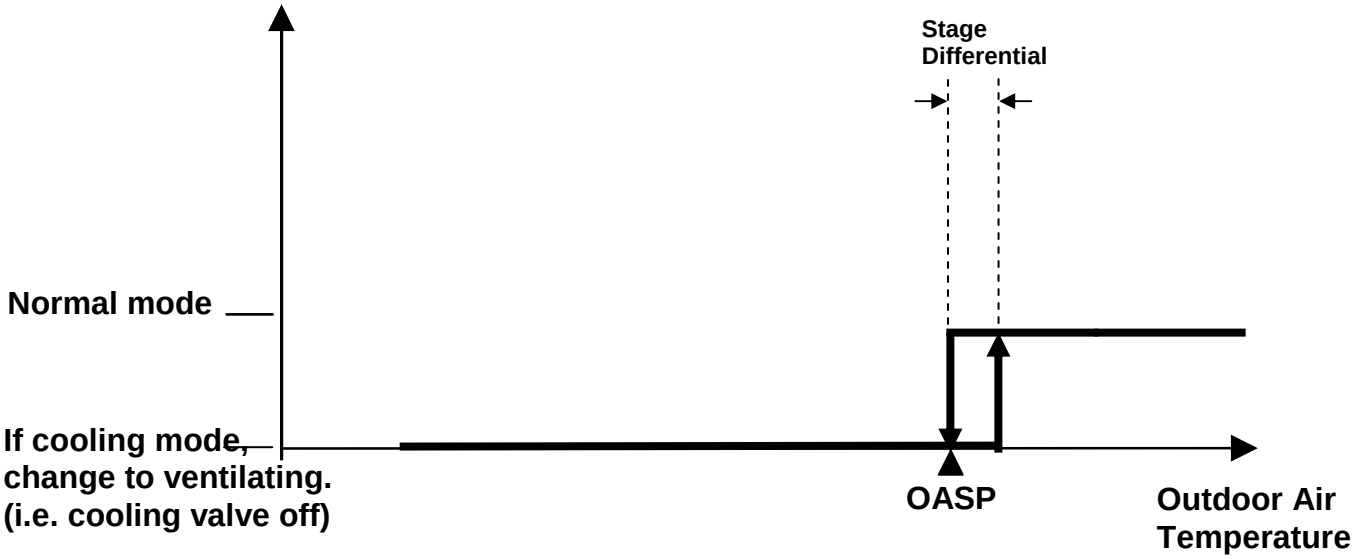
General:

When cooling/heating control output, a “Working ( )” icon will be shown on the LCD and the unit will be active. I.E., Either Heating or cooling valve is open.

Cooling and Heating Control, Auto Changeover, for Example

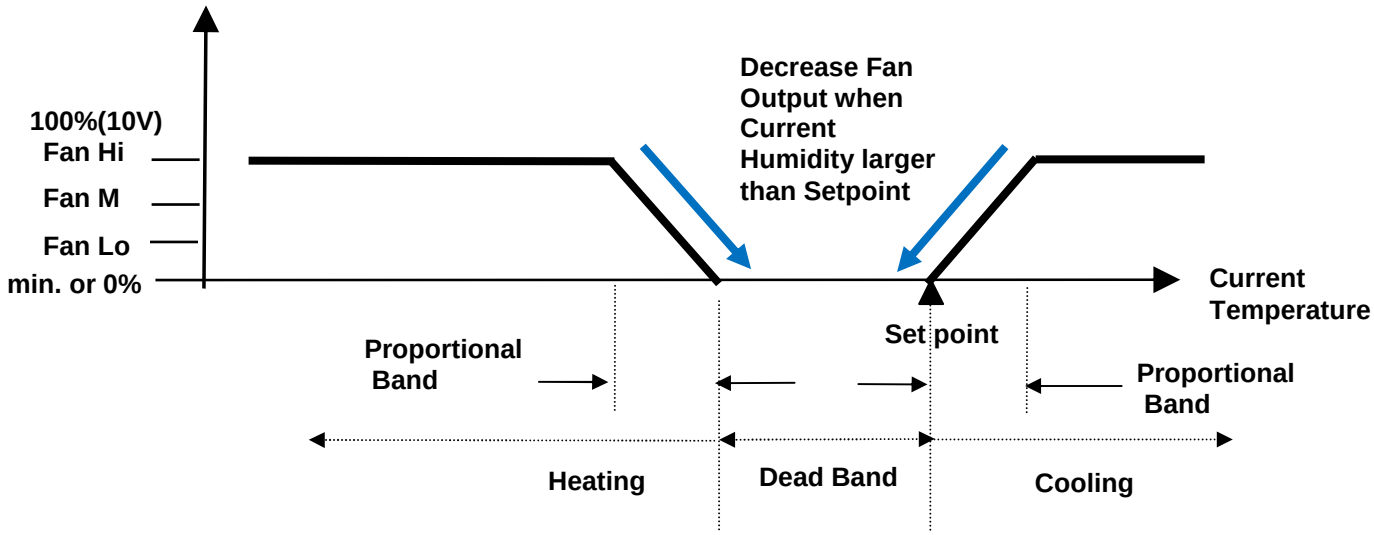


Action for Outdoor Air Temperature



(Note: OASP--Outdoor Air Set-Point temperature)

Modulating Fan Control



Special:

1. If humidity is larger than set-point humidity, the thermostat will decrease Fan output.
2. There is a 2-minute delay to Fan off after stop heating if the lowest fan speed ("LFAn" parameter in Eng. table) is set as "0(stop)". While 2-minute Fan delay, "FAN ( )" icon will be flashing.
3. The icon ①, ②, ③, or ④ will be shown on LCD while the Schedule 1,2,3, or 4 is running or being set.
4. If press "MODE" button, there are three schedule modes "RUN, HALT, and STOP" for selection.
   a.) RUN mode means Running on Schedules. And at the same time an icon (N) will be steadily shown on the LCD.
   b.) HALT mode means temporarily using manual S.P instead of "current" Schedule. And the icon (N) will be flashing on the LCD.
   c.) STOP mode means using manual S.P instead of "all" Schedules. i.e. Temporarily disable all schedules. And the icon (N) will be NOT shown on the LCD.
5. ESI (Energy Saving Input) Contact status -- When the contact is activated (Room unoccupied), a "Moon ( )" icon will be shown on the LCD and the thermostat will change the set-point temperatures of Cooling & Heating to be ESIC & ESIH (refer to Engineer table for details.). When the contact is deactivated (Room back to be occupied), it will set the set-point values back as normal.
6. If disable local ESI contact detection, the room will become always occupied status as default.
7. Door/Window status -- When the status is open, an "Outdoor ( )" icon will be shown on the LCD and the thermostat will be stopped. i.e., Both Heating/cooling valves are closed and Fan is stopped.
8. If disable Door/Window contact detection, the Door/Window will become always "closed" status as defa
9. 9, Enable through Modbus control the run, stop and holt.(Function code: 03, address:6)
10. 10, Enable trough Modbus a standby function in the time schedule, this so we can control when the unit will turn off and on. (Function code: 03, address:41~161)
11. Enable/ disable the heat mode, a simple turn on/off selection in the engineer mode(E-33).
    A. Action for this function is that the only selection is cool mode or ventilation @cool mode.
    B. It will not show the heating symbol.

Engineer Mode Operation

This mode is highly suggested to be operated by trained engineers because it is related to system parameters that will affect the control results. To operate:

1. Press “Up” and “Down” buttons for over 5 seconds to enter into engineer mode;
2. Press UP or DOWN button to rotate the menu item and press MODE button to enter into the item;
3. Press UP or DOWN button to change the setting and press MODE button to confirm the setting and return to menu item selection. For no button pressed for 10 seconds, it will go back to menu item selection. The setting won’t be changed then.
4. To leave Engineer Mode, rotate till “End” and press MODE button or leave the button intact for 10 seconds.
5. Engineer mode operation flow chart:

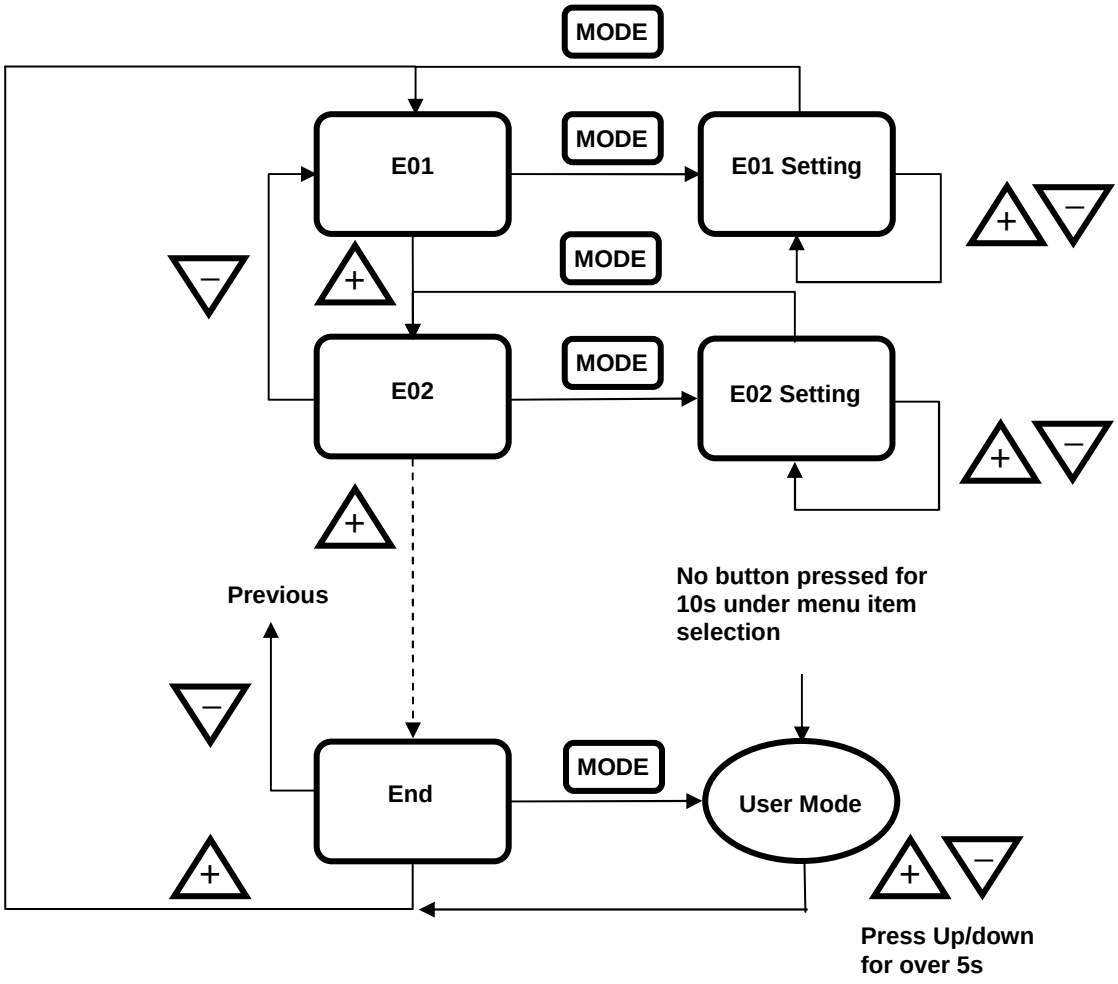


Fig. 3 Engineer Mode operation sequence

6. Engineer mode menu item descriptions:

Item	Mnemonic	Description	°C Type		°F Type		Step
			Default	Range	Default	Range	
1	db	Deadband	4.0	0~10.0	7.0	0~18.0	0.5 (°C/°F)
2	ESIC	Unoccupied(ESI) cooling set point	28.0	25.0~30.0	82.5	77.0~86.0	1.0 (°C/°F)
3	ESIH	Unoccupied(ESI) heating set point	15.0	10.0~22.0	59.0	50.0~72.0	1.0 (°C/°F)
4	I-t	Integral Time and Output Cycle Time	20	10~500	20	10-500	10 (Sec.)
5	OP-L	Not used					
6	SPAn	Not used					
7	SP-L	Low limit for temperature set point	20.0	0~50.0	68.0	32.0~122.0	1.0 (°C/°F)
8	SP-H	High limit for temperature set point	35.0	0~50.0	95.0	32.0~122.0	1.0 (°C/°F)
9	OFSt	Current temperature offset	0.0	-10.0~10.0	0.0	-18.0~18.0	0.1 (°C/°F)
10	Pb	Proportional band or stage width	2.0	0~10.0	3.6	0~18.0	0.1 (°C/°F)
11	diFF	Stage differential	0.5	0.1~1.0	0.9	0.1~1.8	0.1 (°C/°F)
12	LOC	Bit Definition --- bit 0: MODE button 1: Down buttons 2: Up button 3: FAN button 4: Power button 5: SET (or ℃/℉) button 6: ESI contact detection 7: Door/Window contact detection *Bit Value 0: Unlock / enable 1: Lock / disable Examples: 0- Unlock/enable all 1- Lock MODE Button 2- Lock Down Button … 8-Lock Fan Button … 15-Lock MODE & Down & Up & Fan SPEED Buttons 16-Lock Power Button … 64-Disable local ESI contact detection … 128-Disable Door/Window contact detection … 255- Lock/disable all	0	0-255	0	0-255	1
13	ESI	ESI contact definition	0	0~1	0	0~1	0: N.O. 1: N.C.
14	rE-C	Not Used					
15	HtEn	Heat Mode Enable	1	0/1	1	0/1	0: Disable 1: Enable

16	rS	Present Temperature is getting from built-in temperature sensor or remote temperature sensor	0	0~1	0	0~1	0: built-in 1: remote
17	-SP-	Display Options	6	0-6	6	0-6	0: PV & Time 1: SP & Time 2: PV & RH 3: SP & RH 4: PV & Dew 5: Dew & Time 6: PV & Time/RH
18	door	Door or Windows contact definition	0	0~1	0	0~1	0: N.O. 1: N.C.
19	LFAn	Lowest Fan speed in Auto fan mode	1	0~3	1	0~3	0: stop 1: low 2: Med. 3: Hi
20	baud	Baud rate	2.4	2.4 kbps 4.8 kbps 9.6 kbps 19.2 kbps 38.4kbps 57.6kbps 115.2kbps	2.4	2.4 kbps 4.8 kbps 9.6 kbps 19.2 kbps 38.4kbps 57.6kbps 115.2kbps	
21	Prty	Parity/ Data/ Stop bits	N81	E81 N81 N82 O81	N81	E81 N81 N82 O81	
22	id	Modbus Node ID	2	1~255	2	1~255	
23	OASP	Outdoor Temperature Set Point for Switching Ventilation Only	17.0	0~50.0	63.0	32.0~122.0	1.0 (°C/°F)
24	rhOF	Offset for humidity reading	-20.0	-30.0~30.0	-20.0	-30.0~30.0	0.1 (%RH)
25	nFAn	Minimum Fan Output at Auto Fan Mode	10	0%~ hFAn	10	0%~ hFAn	1%
26	hFAn	Maximum Fan Output at Auto Fan Mode	100	nFAn~ 100%	100	nFAn~ 100%	1%
27	FAnL	Low Fan Speed Setting	33	nFAn ~Fan2	33	nFAn ~Fan2	1%
28	Fan2	Med. Fan Speed Setting	66	FAnL~FAnH	66	FAnL~FAnH	1%
29	FAnH	Hi Fan Speed Setting	100	Fan2~ hFAn	100	Fan2~ hFAn	1%
30	run	Fan Runs at Set 3 Speeds or Free Speed between Min and Max Fan Output at Auto Fan Mode	0	0~1	0	0~1	0: Free Speed 1: 3 Speeds
31	rhSP	Humidity Setpoint	70.0	0~100.0	70.0	0~100.0	1 %RH
32	tESt	Self-Diagnostic					
33	rSt	Reset all parameters as factory defaults					
34	End	Exit Engineer Mode					

Modbus Network Specifications

Transmission

- Physical layer: RS485 (2 wires)
- Baud rate: 19200 bps -- default
- Data format(RTU mode):1 start bit, 8 data bits, 1 Even parity check, 1 stop bit -- default

MODBUS

- Address range: 1~255 (0 is broadcast)
- Supported function code: 1, 2, 3, 4, 5, 6
- Data format : address | function code | data 1 | … | data n | CRC-16 low byte | CRC-16 high byte
- Data bytes: 252 bytes(Max.)
- Temperature representation: the original temperature degree value has be multiplied by 10 to be saved in the register.
  ex.. 25.5 ℃ is represented by: 00 FF (in hex) i.e. 255 (in dec.)
  5.0 ℃ is represented by: 00 32 (in hex) i.e. 50 (in dec.)

Modbus tables

Read/Write Coils (Function Code 01/05)

Function code	Address	Description	Definition
01	0	On/Off Status of Thermostat	0: Off, 1: On
01	1	General Alarm Status*	0: Off, 1: On

Function code	Address	Description	Definition
05	0	Remote Thermostat On/Off Control	0000: Off FF00: On
05	1	General Alarm Notice*	0000: Off FF00: On

*Note: General alarm status is set through Modbus communication only.

Read Discrete Input (Function Code 02)

Function code	Address	Description	Definition
02	0	Status of Local ESI Contact	0: Room Occupied 1: Room Unoccupied
02	1	Status of Window/ Door	0: Door/Window Closed 1: Door/Window Open
02	2	Status of Cooling/ Heating Control Output	0: Close & Off 1: Open & On
02	3	Status of Relay 1 - Cooling	0: Off, 1: On
02	4	Status of Relay 2 - Heating	0: Off, 1: On
02	5	Not Used	
02	6	Not Used	
02	7	Not Used	

Read/Write Holding Register (function code 03/06/16)

Function code	Address	Description	Definition
03/06/16	0	Set Point temperature (SP)	°C :0~500 (0.0～50.0℃) °F : 320~1220 (32.0~122.0°F)
03/06/16	1	°C/ °F	0: °C 1: °F
03/06/16	2	Fan mode	0: Auto 1: Low 2: Med. 3: Hi
03/06/16	3	Assigned Outdoor Temperature	-999~9999 (-99.9～999.9℃/°F)
03/06/16	4	Working Mode Override: Auto, Heat, Cool or Ventilation	0: Cool Mode 1: Heat Mode 2: Ventilation 3: Auto Mode
03	5	Current Working Mode: Heat, Cool or Ventilation	0: Cool Mode 1: Heat Mode 2: Ventilation
03/06/16	6	Schedule and Timer Control Run/ Halt/ Stop	0: Run 1: Halt 2: Stop
03/06/16	7	Not Used	
03/06/16	8	Running time of Valve (Hr.)	0~65535 (Hr.) for reading but 0~30000 (Hr.) for writing.
03/06/16	9	Running time of Valve (M.)	0~59 (Minute)
03/06/16	10	Running time of Valve (Sec.)	0~59 (sec.)
03/06/16	11	Deadband	°C :0~100 (0.0~10.0 °C) °F : 0~180 (00~18.0 °F)
03/06/16	12	Unoccupied (ESI) Cooling setpoint	°C :250~300 (20.0~30.0 °C) °F : 770~860 (77.0~86.0 °F)
03/06/16	13	Unoccupied (ESI) Heating setpoint	°C :100~220 (10.0~22.0 °C) °F : 500~720 (50.0~72.0 °F)
03/06/16	14	Integral Time and Output Cycle Time	10-500 (sec.)
03/06/16	15	Not Used	
03/06/16	16	Not Used	
03/06/16	17	Low limit for Set-point Temperature	°C :0~500 (0.0～50.0℃) °F : 320~1220 (32.0~122.0°F)
03/06/16	18	High limit for Set-point Temperature	°C :0~500 (0.0～50.0℃) °F : 320~1220 (32.0~122.0°F)

03/06/16	19	Offset for Current Temperature	°C :-100~100 (-10.0~10.0 °C) °F : -180~180 (-18.0~18.0 °F)
03/06/16	20	Proportional Band or Stage Width	°C :0~100 (00~10.0 °C) °F : 0~180 (00~18.0 °F)
03/06/16	21	Stage Differential	°C :1~10 (0.1~1.0 °C) °F : 1~18 (0.1~1.8 °F)
03/06/16	22	LOCK	Bit Definition --- bit 0: MODE button 1: Down buttons 2: Up button 3: FAN button 4: Power button 5: SET (or ℃/℉) button 6: ESI contact detection 7: Door/Window contact detection 8: Reserved 9: Override/DOs set by T'stat(0) or BMS(1) 10~15: reserved *Bit Value 0: Unlock / enable 1: Lock / disable Examples: 0- Unlock/enable all 1- Lock MODE Button 2- Lock Down Button 3- Lock MODE & Down Buttons … 8-Lock Fan Button … 64-Disable ESI contact detection … … 512- DOs set by BMS
03/06/16	23	ESI Contact Definition	0: N.O. 1: N.C.
03/06/16	24	Not Used	
03/06/16	25	Heat Mode Enable	0: Disable 1: Enable
03/06/16	26	Present Temperature Source	0: Built-In Temp. Sensor 1: Remote Temp. Sensor
03/06/16	27	LCD Display Options	0: T & Time 1: SP & Time 2: T & RH 3: SP & RH 4: T & Dew 5: Dew & Time 6: T & (Time & RH Rotate)

03/06/16	28	Door or Windows Contact Definition	0: N.O. 1: N.C.
03/06/16	29	Lowest Fan Speed in Auto Fan Mode	0: Stop 1: Low 2: Med. 3: Hi.
03/06/16	30	Baud Rate	0: Reserved 1: 2400 bps 2: 4800 bps 3: 9600 bps 4: Reserved 5: 19200 bps 6: 38400 bps 7: 57600 bps 8: 115200 bps
03/06/16	31	Parity/ Data/ Stop Bits	0:E81 1:O81 2:N82 3:N81
03/06/16	32	Modbus Node ID	1~255
03/06/16	33	Outdoor Temperature Set Point for Switching Ventilation Only	°C : -500~500 (-50.0～50.0℃) °F : -580~1220(-58.0~122.0°F)
03/06/16	34	Humidity Offset Value	-300~300(-30.0～30.0 %RH)
03/06/16	35	Minimum Fan Output at Auto Fan Mode	0~Reg.36(%)
03/06/16	36	Maximum Fan Output at Auto Fan Mode	Reg.35~100(%)
03/06/16	37	Low Fan Speed Setting	0~Reg.38(%)
03/06/16	38	Med. Fan Speed Setting	Reg.36~Reg.39(%)
03/06/16	39	Hi Fan Speed Setting	Reg.38~100(%)
03/06/16	40	Fan Runs at Set 3 Speeds or Free Speed between Min and Max Fan Output at Auto Fan Mode	0: Free Speed 1: 3 Speeds
03/06/16	41	Humidity Set Point	0~1000(0~100.0 %RH)

<table>
<tr><td>03/06/16</td><td>42~49</td><td>Time and Date<table><tr><td>Addr.</td><td>Description</td></tr><tr><td>42</td><td>Display Hour Format:
0(24Hr), 1(12Hr)</td></tr><tr><td>43</td><td>Current Seconds: 0~59</td></tr><tr><td>44</td><td>Current Minutes: 0~59</td></tr><tr><td>45</td><td>Current Hours: 0~23</td></tr><tr><td>46</td><td>Today's Weekday: 0~6 for Sun. to Sat.</td></tr><tr><td>47</td><td>This Year: 0~99</td></tr><tr><td>48</td><td>This Month: 1~12</td></tr><tr><td>49</td><td>Today's Date: 1~31</td></tr></table></td><td></td></tr>
<tr><td>03/06/16</td><td>50~77</td><td>Schedule’s time in sequence from #1~#4 of Sun to Sat<table><tr><td>Addr.</td><td>Time of Schedule</td><td>Day</td></tr><tr><td>50</td><td>Time of Schedule 1</td><td>Sunday</td></tr><tr><td>51</td><td>Time of Schedule 2</td><td>Sunday</td></tr><tr><td>52</td><td>Time of Schedule 3</td><td>Sunday</td></tr><tr><td>53</td><td>Time of Schedule 4</td><td>Sunday</td></tr><tr><td>54~73</td><td>Time of Schedule 1~4</td><td>Mon. to Fri.</td></tr><tr><td>74</td><td>Time of Schedule 1</td><td>Saturday</td></tr><tr><td>75</td><td>Time of Schedule 2</td><td>Saturday</td></tr><tr><td>76</td><td>Time of Schedule 3</td><td>Saturday</td></tr><tr><td>77</td><td>Time of Schedule 4</td><td>Saturday</td></tr></table></td><td>HHMM in 24-hour format (0~2359), 2400 for skip</td></tr>
<tr><td>03/06/16</td><td>78~133</td><td>Scheduled cooling and heating temperature set point in sequence from #1~#4 of Sun to Sat<table><tr><td>Addr.</td><td>Scheduled SP</td><td>Day</td></tr><tr><td>78</td><td>Cooling SP of Sched. 1</td><td>Sunday</td></tr><tr><td>79</td><td>Heating SP of Sched. 1</td><td>Sunday</td></tr><tr><td>80</td><td>Cooling SP of Sched. 2</td><td>Sunday</td></tr><tr><td>81</td><td>Heating SP of Sched. 2</td><td>Sunday</td></tr><tr><td>82</td><td>Cooling SP of Sched. 3</td><td>Sunday</td></tr><tr><td>83</td><td>Heating SP of Sched. 3</td><td>Sunday</td></tr><tr><td>84</td><td>Cooling SP of Sched. 4</td><td>Sunday</td></tr><tr><td>85</td><td>Heating SP of Sched. 4</td><td>Sunday</td></tr><tr><td>86~125</td><td>Cooling SP/ Heating SP of Sched. 1~4</td><td>Mon. to Fri.</td></tr><tr><td>126</td><td>Cooling SP of Sched. 1</td><td>Saturday</td></tr><tr><td>127</td><td>Heating SP of Sched. 1</td><td>Saturday</td></tr><tr><td>128</td><td>Cooling SP of Sched. 2</td><td>Saturday</td></tr><tr><td>129</td><td>Heating SP of Sched. 2</td><td>Saturday</td></tr><tr><td>130</td><td>Cooling SP of Sched. 3</td><td>Saturday</td></tr><tr><td>131</td><td>Heating SP of Sched. 3</td><td>Saturday</td></tr><tr><td>132</td><td>Cooling SP of Sched. 4</td><td>Saturday</td></tr><tr><td>133</td><td>Heating SP of Sched. 4</td><td>Saturday</td></tr></table></td><td>Cooling: 100~370(x10^{o}C)/ 50~985(x10^{o}F)
Heating: 45~320(x10^{o}C)/ 40~895(x10^{o}F)
* Automatic Cooling/ Heating Changeover model only use Cooling Setpoint. Heating Setpoint is Deadband from Cooling Setpoint</td></tr>
</table>

<table>
<tr>
<td>03/06/16</td>
<td>134~161</td>
<td>Timer’s time and on/ off in sequence from #1~#4 of Sun to Sat
<table>
<tr><th>Addr.</th><th>Timer No.</th><th>Time</th><th>Day</th></tr>
<tr><td>134</td><td>Timer 1</td><td>2400</td><td>Sunday</td></tr>
<tr><td>135</td><td>Timer 2</td><td>2400</td><td>Sunday</td></tr>
<tr><td>136</td><td>Timer 3</td><td>2400</td><td>Sunday</td></tr>
<tr><td>137</td><td>Timer 4</td><td>2400</td><td>Sunday</td></tr>
<tr><td>138~ 157</td><td>Timer1~4 for each weekday</td><td>2400</td><td>Monday to Friday</td></tr>
<tr><td>158</td><td>Timer 1</td><td>2400</td><td>Saturday</td></tr>
<tr><td>159</td><td>Timer 2</td><td>2400</td><td>Saturday</td></tr>
<tr><td>160</td><td>Timer 3</td><td>2400</td><td>Saturday</td></tr>
<tr><td>161</td><td>Timer 4</td><td>2400</td><td>Saturday</td></tr>
</table>
</td>
<td>+/-HHMM in 24-hour format (-2400~2359), 2400 to skip
Negative time represent “OFF”; positive for “ON” setting.
e.g. “-1825” means to turn off at 18:25; “830” means to turn on at 08:30</td>
</tr>
</table>

Example: To turn off during weekend and start on Monday, set <Register 158> to “-2400”(means off at 00:00, Saturday) and <Register 138> to “0”(means on at 00:00, Monday)

Read input register (function code 04)

Function code	Address	Description	Definition
04	0	Current Temperature	-999~9999: -99.9～999.9℃/°F
04	1	Not Used	
04	2	Current Fan Output Percentage	0~100: 0~100%
04	3	Current Humidity	0~1000: 0～100.0 %RH
04	4	Active Temperature Setpoint	-999~9999: -99.9～999.9℃/°F
04	5	Current Dew Point Temperature	-999~9999: -99.9～999.9℃/°F
04	6	Built-in Temperature Sensor Value	-999~9999: -99.9～999.9℃/°F
04	7	Remote Temperature Sensor Value	-999~9999: -99.9～999.9℃/°F

SYSTEM NETWORK DIAGRAM: