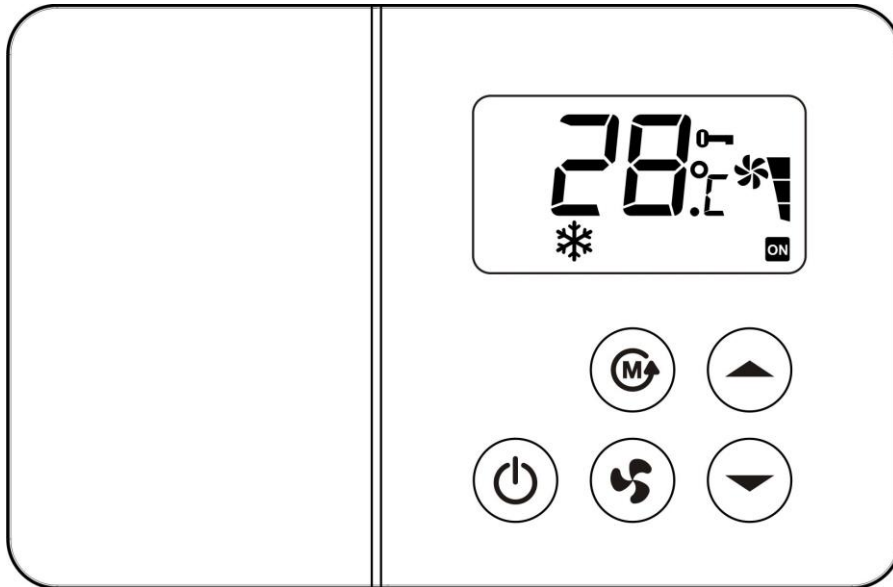


Microprocessor control**1. INTRODUCTION**

The following sections describe the features and functional specifications of the LCD Digital room thermostat.



Microprocessor control

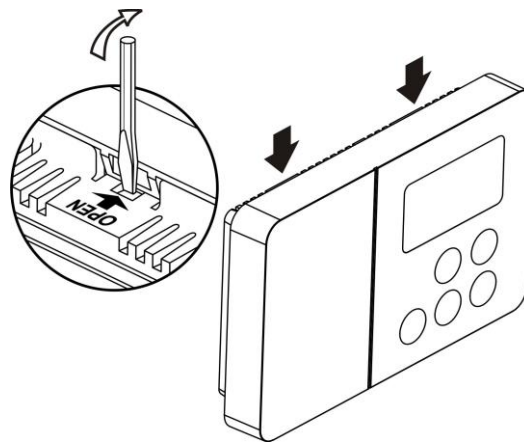
2. INSTALLATION

Read these instructions thoroughly before installing product. Failure to follow these instructions could damage the product or cause

A hazardous condition. Check the voltage and current ratings on the product to ensure that it is suitable for your application. Installer must be a trained, experienced service technician. Check product for proper operation after installation.

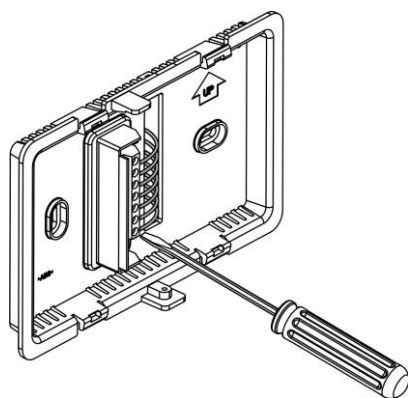
⚠ CAUTION

Damage to cooling system may occur. Disconnect power from the equipment at the main breaker/fuse block while installing the thermostat.

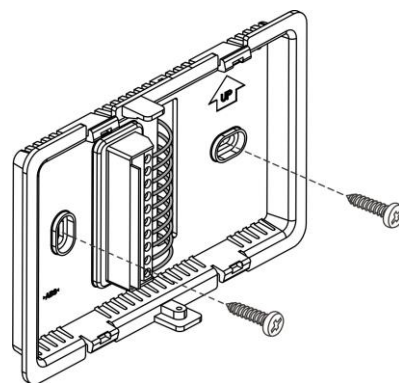


1. Lift and open top side using screwdriver.

Installation A (wires through wall)



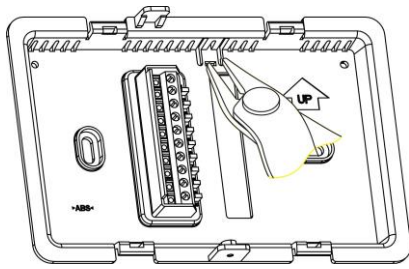
1.1 Use cable size 0.5-1 sq. mm connect the wires into terminals.



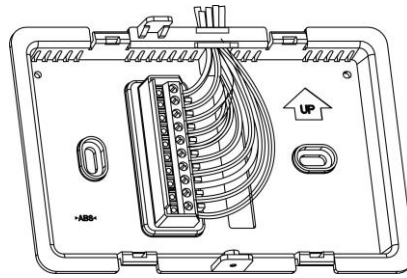
1.2 Installing back plate into the wall with screws.

Microprocessor control

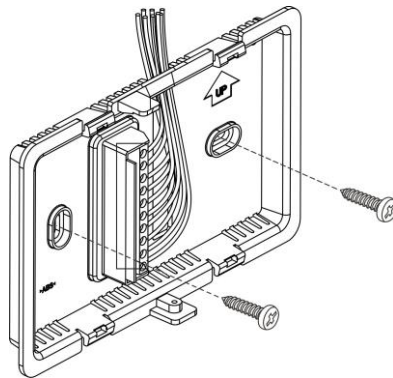
Installation B (wires on wall)



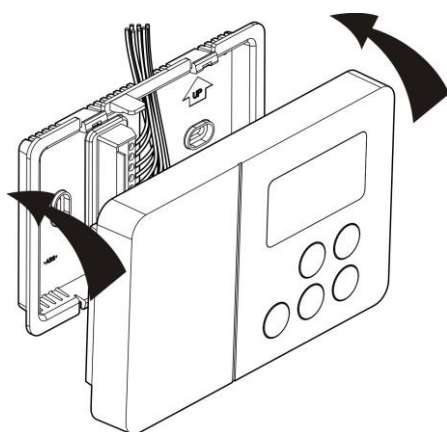
1.1 Cut the plastic and open the hole with pliers.



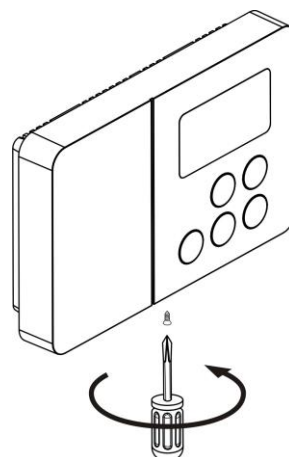
1.2 Use cable size 0.5-1 sq. mm connect the wires into terminals.



1.3 Installing back plate into the wall with screws.



2. Install the front case, carefully inspect wiring as per diagram before mounting thermostat.




3. Tighten the screw firmly.

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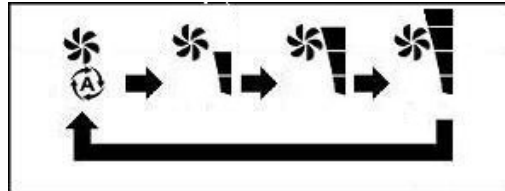
3. FEATURES

3.1 POWER

Press  button to turn on/off the equipment. When turned on, it will operate according to the last program setting.

3.2 FAN

Press  button to select the fan speed (auto, high, medium or low mode).





When the fan speed is put in auto mode, the speed will be adjusted automatically according to the difference between the room temperature and the setpoint temperature.

- If the difference is 3 °C (6°F) or more, the speed is high.
- If the difference is 2 °C (4°F), the speed is medium.
- If the difference is 1 °C (2°F) or less, the speed is low.

Note: The FAN button can be used only in the FAN, COOL, HEAT and AUTO modes, it can not be used in the DRY mode.

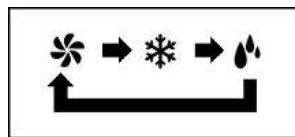
3.3 TEMPERATURE SETTING

The setpoint temperature can be set in the range of 15-30 °C or 58-88 °F by pressing the  or  buttons. The LCD display on the unit will show the setpoint temperature and **Set** icon flashing for 5 seconds.

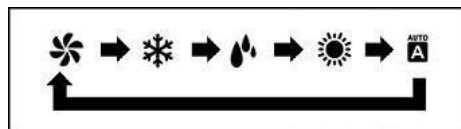
The system can be preset from the factory to display the temperature in °C or °F.



3.4 MODE

By pressing the MODE button, the air conditioner can be put in 3 operating modes (fan, cool, dry)



5 operating modes (fan, cool, dry, heat, auto)



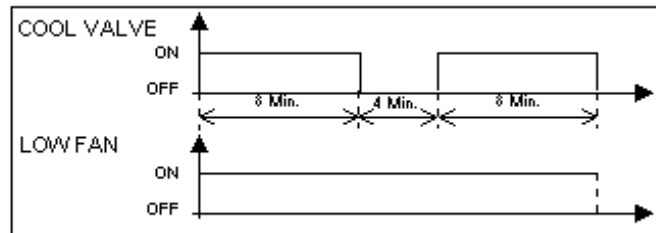
Fan : When the system is put in the Fan mode, the system will operate as fan only. The  and  buttons can not be used.

Microprocessor control

Cool : When the system is put in the Cool mode, the system will operate as an air conditioner. The cool valve or compressor will

- operate if $T_{room} \geq T_{set} + 1$
- stop if $T_{room} \leq T_{set}$

Dry : When the system is put in Dry mode, the system (cool valve or compressor) will operate as a dehumidifier with the algorithm below.



Heat : The system can be preset from the factory to control Heat Valve or Heat Pump or Electric Heater.

Heat Valve (Hot water valve)

When the system is put in Heat mode (Hot water), the system will operate as a hot water fan coil unit. The heat valve will

- operate if $T_{room} \leq T_{set} - 1$
- stop if $T_{room} \geq T_{set}$

Heat Pump

When the system is put into heat mode (heat pump), the system will operate as a heat pump unit.

The reversing valve will be activated in heat mode. The control logic for heat pump mode will be:

- operate if $T_{room} \leq T_{set} - 1$ and compressor has stopped for longer than 3 minutes (compressor delay protection)
- stop if $T_{room} \geq T_{set}$

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Heater (Electric-heater)

When the system is put in Heat mode (Electric-heater), the system will operate as a heater. The electric-heater will

- operate if $T_{room} \leq T_{set} - 1$
- stop if $T_{room} \geq T_{set}$

When the system is turned off while the heater is operating, the Fan will be delayed 30 seconds before turning off to ventilate the heat accumulated in the heater.

Auto : When the system is put in Auto mode, the system will switch between Heat and Cool automatically.

The auto mode will operate as follows

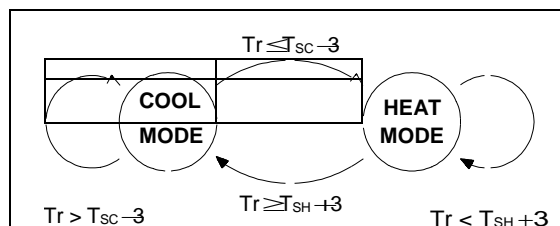
- Define
- T_r = room temperature
 - T_s = setting temperature
 - T_{SC} = temperature used as the decision point while in COOL mode
= $T_s + 1$
 - T_{SH} = temperature used as the decision point while in HEAT mode
= $T_s - 1$

The system will switch from COOL to HEAT mode if

$$T_r \leq T_{SC} - 3$$

The system will switch from HEAT to COOL mode if

$$T_r \geq T_{SH} + 3$$



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3.5 BUTTON PRESS SETBACK

The default remote setback option is for setback via a **MODE** button press on thermostat. In this mode, the thermostat can quickly be setback by pressing and holding down the MODE button for more than 3 seconds. When the system is put in this mode, the LCD will show the **Setback** icon.(see IS CODE P7)

Setback mode

For Cool mode, the system operates at 25 °C (77 °F) and Auto fan speed.
For Heat mode, the system operates at 20 °C (68 °F) and Auto fan speed.
For Auto mode, the system operates as above for Cool and Heat modes.
To exit from this mode press and hold the MODE button for more than 3 seconds.

Note :

- It will automatically exit from the Setback mode if the operating mode is changed.
- Turning the unit on/off will not exit from the Setback mode.

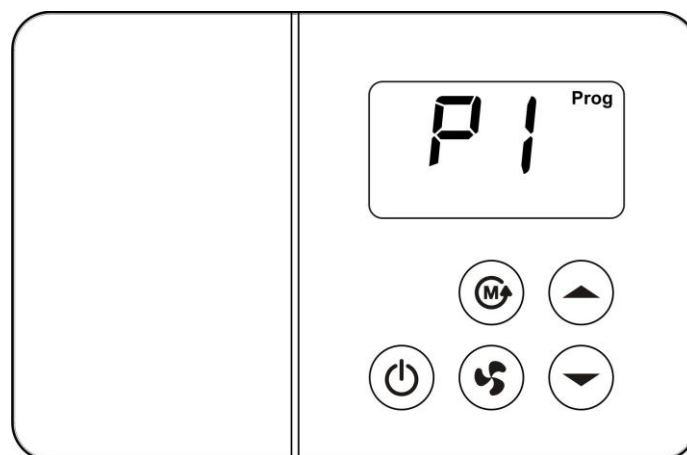
3.6 REMOTE SETBACK

Remote setback is activated by a dry contact closure on the remote setback input from occupancy sensor, time switch, or hotel card key. The thermostat controls to setback setpoints for increased energy savings (Setback mode). When the system is put in this mode, the LCD display will show the **Setback** icon. When setback is active, all buttons on the thermostat are disabled. However, the button combinations to access the Installer setup (IS) remain enabled (see IS CODE P7)

3.7 INSTALLER SETUP (IS) MODE

To enter Install Setup Mode:


Press and hold both  and  button for 3 seconds.



When the system is put in IS mode.

Microprocessor control**To enter the setup parameters:**

1. Press ▲ or ▼ buttons to select IS code (P1 - P8)
2. Press **MODE** button to set the option value.
3. Press ▲ or ▼ buttons to change the option value.
4. After the desired value displays, press **MODE** button to store your value selection and display the next IS code.




Note : Press  button or do not press any buttons for 30 seconds to exit the IS mode.

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Table. Installer Setup (IS) Codes and Options.

IS CODE	CODE DESCRIPTION	OPTION VALUE	OPTION DESCRIPTION	NOTE
P1	System Type	0	Cool mode	
		1	Heat/Cool mode	
P2	Sensor Type	0	On board Sensor	Default
		1	External Sensor	
P3	Heater Enable	0	No Heater	
		1	Heater	
P4	Temperature Scale	0	Degree Celsius (°C)	
		1	Degree Fahrenheit (°F)	
P5	Display Temperature Adjustment	-8 to 8 °F	Range is -8 °F to 8 °F	Default is -4 °F
		-4 to 4 °C	Range is -4 °F to 4 °C	Default is -2 °C
P6	Temperature Display Mode	0	Display Room Temperature	Default
		1	Display Setpoint	
P7	Setback	0	Disabled	
		1	Hotel card enabled N.O. for unoccupied mode with 1second software delay going from UnOccupied to Occupied; 2 minutes delay going from Occupied to UnOccupied	
		2	Hotel card enabled N.C. for unoccupied mode with 1second software delay going from UnOccupied to Occupied; 2 minutes delay going from Occupied to UnOccupied	
		3	Hotel card enabled N.O. for unoccupied mode with 1second software delay going from UnOccupied to Occupied; 30 seconds delay going from Occupied to UnOccupied	
		4	Hotel card enabled N.C. For unoccupied mode with 1second software delay going from UnOccupied to Occupied; 30 seconds delay going from Occupied to UnOccupied	
P8	Compressor delay	5	Button Press	Default
		0	Compressor delay 3 minutes.	
		1	No compressor delay.	

3.8 LOCK SYSTEM

Press and hold **MODE**,  and  buttons for 5 seconds. All buttons are locked out, The LCD displays 

To unlock the thermostat, press and hold **MODE**,  and  buttons for 5 seconds.

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4. SYSTEM FEATURES

4.1 REVERSING VALVE CHANGE PROTECTION (FOR HEAT PUMP)

Whenever the reversing valve is to change its state, either OFF • ON or ON • OFF, it can be done only after the compressor stops at least one minute.

4.2 COMPRESSOR DELAY PROTECTION

If the unit is preset to heat/cool with compressor delay protection, each time the compressor is off, there will always be a minimum 3-minute delay before the compressor can restart. In case of power interruption, the system will have a random compressor delay in the range of 3-4 minutes.

4.3 AUTO RESTART

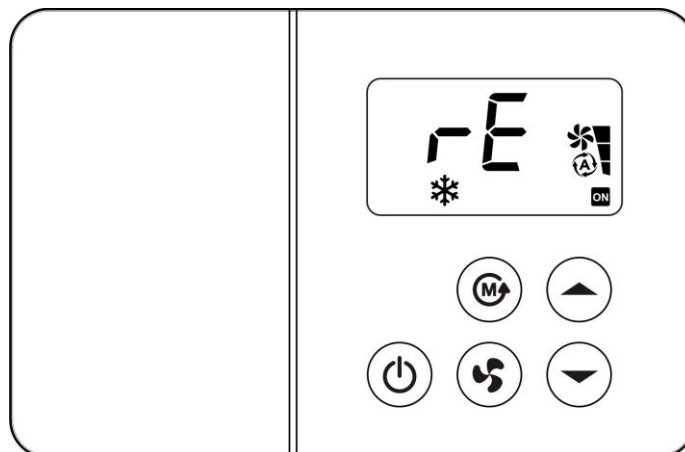
All the setpoint parameters are kept in non volatile memory. When there is a power failure and return to normal, the system will resume its operation with the same setpoint parameters.

4.4 WATCHDOG

There is a watchdog circuit to watch the operation of the microprocessor. If it malfunctions, this circuit will reset the microprocessor automatically.

4.5 SENSOR ERROR ALARM

If the room sensor has an open/short circuit, the controller will stop the equipment and the display will show **rE** flashing.



4.6 Compressor/ Valve/ Heater status display

If the compressor or valve or heater is ON, the LCD will show **ON** icon.

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5. ELECTRICAL CHARACTERISTICS

POWER SUPPLY:	100-240 VAC, 50/60 Hz
TEMPERATURE:	
Temperature accuracy	±1°C
Storage temperature	0 – 70 °C
Ambient temperature	10 – 50 °C
Setting temperature range	15 – 30 °C (58 – 88 °F)
RELAY:	
Rating (inductive load)	
- <i>Maximum switching capacity</i>	2 A @ 240 V (AC) 4 A @ 120 V (AC)
REMOTE SETBACK INPUT:	
- <i>Minimum current</i>	10 mA @ 5 V (DC)
EXTERNAL SENSOR:	
NTC type 6.8 kohm @ 25 °C	

6. WIRING DIAGRAM

