

**INSTALLATION, OPERATION & APPLICATION GUIDE FOR
DIGITAL WALL THERMOSTAT 9420*381 & 9420*382**



WARNING!

This appliance is not intended for use by young children or infirm persons unless they have been adequately supervised by a responsible person to ensure they can use the appliance safely.

CAUTION!

This thermostat should be installed by trained technicians only. Adhere to all local and national codes and ordinances.

DISCONNECT ALL POWER TO THE SYSTEM BEFORE INSTALLING, REMOVING, OR CLEANING.

Features

The thermostat wiring is factory installed by the OEM (Original Equipment Manufacturer). RV Products suggests the thermostat wiring be a minimum of 20 gauge. The thermostat is intended for use with a 12 VDC control circuit that does not exceed 2 amps.

The thermostat is equipped with a self-resetting PTC fuse located in the thermostat. The fuse is designed to “open” if the circuit is mis-wired or if there is a short in the system.

If the PTC fuse continues to “open”, the fault must be located and corrected.

The thermostat includes a mounting plate, 2 screws and 2 wall anchors. An oversized accessory wall plate (9420*3501) is available for purchase if needed.

Thermostat and Room Temperature Sensor Location

- An internal temperature sensor on the thermostat can act as the room sensor.
- Alternatively, a remote temperature sensor can be connected to the thermostat to the SENS connectors. The thermostat will show “REMOTE” at the top of the display. This situation would allow the thermostat to be located virtually anywhere in the coach, as long as the user can access the thermostat to operate it. The Remote Room Sensors available are 8330-5191 (white) and 8330-3101 (black).

Installation

ELECTRICAL SHOCK HAZARD – Turn off power at the main service panel by removing the fuse or switching the appropriate circuit breaker to the OFF position before removing the existing thermostat (if applicable).

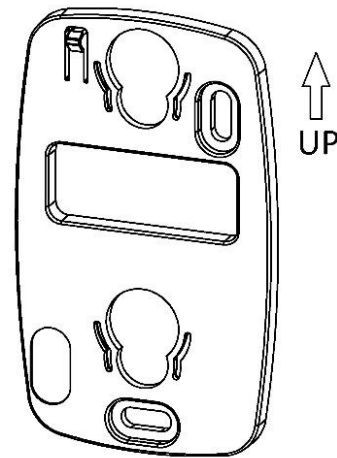
A. Thermostat Location

The thermostat is a sensitive electronic instrument. For accurate temperature control and comfort, the following should be considered:

1. Locate the thermostat on an inside wall about five feet above the floor. Pick a dry area where the air circulation is good.
2. Do not install the thermostat where there are unusual heating conditions such as direct sunlight, near heat producing appliances (TV, radio, wall lamp, etc.), a furnace supply register or an air conditioner supply register.
3. The Thermostat must be installed in a vertical position.

B. Installing the Thermostat

1. Place the thermostat mounting plate against the wall where the thermostat will be mounted orienting it as shown below.



2. Affix the mounting plate to the wall using two screws. Wall anchors are included if needed to secure the mounting plate to the wall.

3. Connect the vehicle thermostat wiring to the thermostat:

Refer to the section “Wire Labeling and Connectors” section in this manual for wiring the thermostat.

Refer to the section “Dip Switches” section in this manual to set the dip switches to the appropriate settings for the equipment installed on the coach.

4. After the thermostat wiring is complete and the dip switches have been set, place the thermostat on the mounting plate and gently slide the thermostat down to lock the thermostat onto the mounting plate.

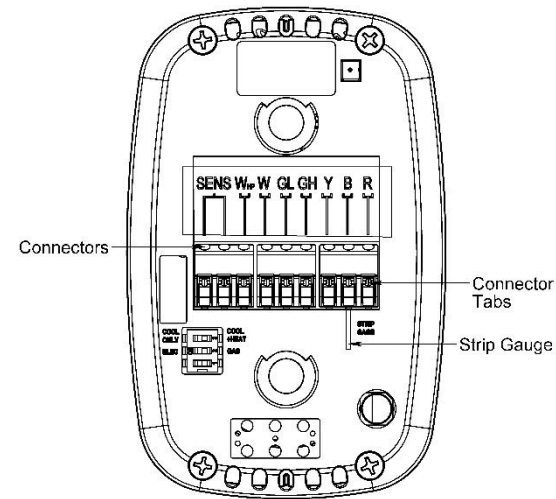
5. Turn on the power to the thermostat.

REFER TO THE OPERATION GUIDE FOR THERMOSTAT DISPLAY INFORMATION & THERMOSTAT OPERATION

Wire Labeling and Connectors

The labeling of the inputs/outputs of the thermostat can be found on the rear of the thermostat.

Refer to the table below for labels and definitions.



Label on Thermostat	Definition
R	Voltage input (+12V)
B	Ground
Y	Compressor output
GH	Fan high output
GL	Fan low output
W	Gas heat output
WHP	Elec heat output ¹
SENS	External sensor input

¹ WHP Connection for Electric heat output is used for Heat Pump or the strip heat accessory for the A/C.

The connectors of the thermostat can accept 20 AWG solid wire. To insert a wire, strip the wire to the appropriate length (5/16”). The stripped length can be checked by using the strip gage on the back of the thermostat. Press the stripped wire into the connector until the initial resistance is overcome. Lightly tug on the wire to ensure the connection is solid.

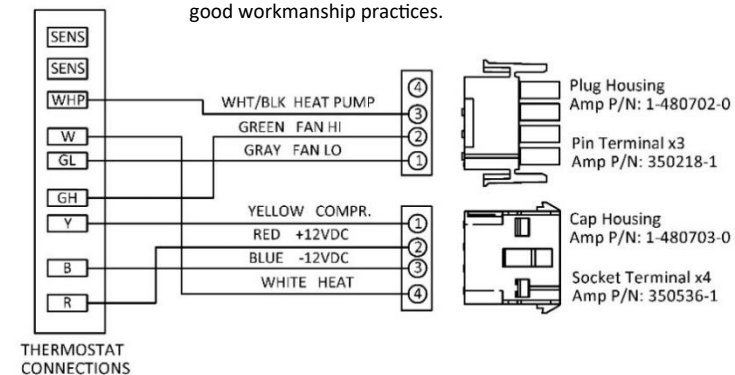
To remove a wire, press down on the connector’s tab with a screwdriver and pull wire vertically. It won't take much force to pull the wire to remove it.

If the thermostat had wires previously inserted into one of the connectors, it is recommended to use the same gauge wire in that position or a larger (diameter) gauge wire.

Thermostats equipped with plugs:

Reference illustration below for connectors.

If the wires are cut to remove the plugs, the wires must be spliced (or terminated) following the electrical code and using good workmanship practices.



Dip Switches

The dip switches will enable/disable certain functions of the thermostat. To apply any changes to the dip switches after initial installation, the device must be rebooted. Refer to the Manual Reboot section for instructions.

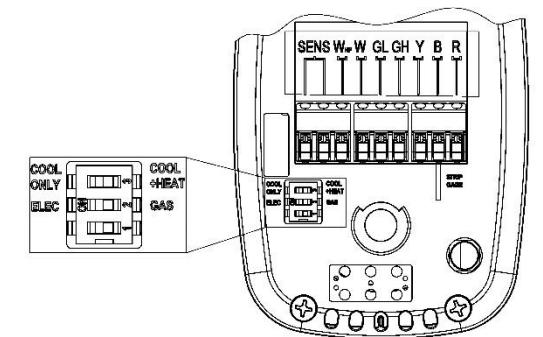
Refer to the table below for the dip switch descriptions.

Dip Switch	Label	Function
1	No Label	Future use
2	Gas (Factory Default)	Disables Electric heat mode (gas heat only)
	Elec	Enables Electric and gas heating mode
3	Cool+ Heat (Factory Default)	Enables cool and heat modes (Auto Changeover)
	Cool Only	Enables cool mode and disables all heating modes

The dip switches can be accessed from the rear of the thermostat when the back plate is not attached. The dip switches are labeled to match their function.

NOTE: The Dip Switches **MUST** be properly set for the equipment installed on the vehicle for the thermostat functions to work as intended.

If the equipment installed on the vehicle is changed or modified, the Dip Switches must be changed to reflect the new equipment installed to enable the thermostat to work as intended.



HVAC Mode and Fan Mode Selection

Upon powering up the thermostat, the display will show the HVAC mode set to ‘Off’, the fan mode set to ‘Off’, the current temperature, temperature scale (default is set to F for Fahrenheit) and remote sensor, if used.

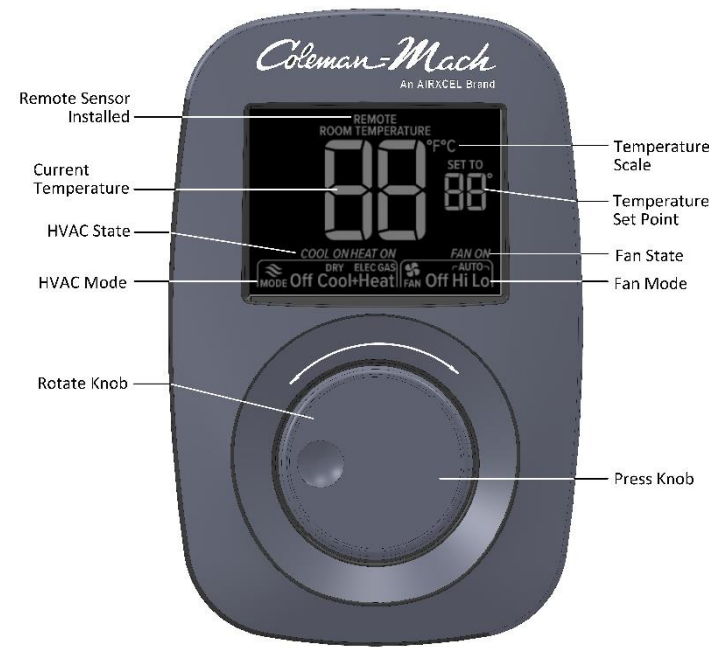
To set the HVAC mode - press the knob, the display will now show the HVAC mode section with the currently selected mode blinking. Rotate the knob to scroll through the options. When the desired setting is blinking, press the knob to accept.

If off, cool, or cool+heat mode was selected, the fan mode will illuminate with the currently selected mode blinking. Rotate the knob to scroll through the options. When the desired setting is blinking, press the knob to accept.

The display will now show HVAC mode and state (if applicable), the current temperature, temperature units, the sensor in use, the set point temperature (when in an HVAC mode other than off), and the fan mode and state (if applicable).

When the thermostat returns to this screen, it will check to see if any outputs need to be enabled or disabled and performs those actions.

OPERATION GUIDE FOR DIGITAL WALL THERMOSTAT
9420*381 & 9420*382



Thermostat Display

Remote Sensor Installed - Remote displays when the thermostat is controlled by a sensor remote to the thermostat. In this example, a remote sensor is used therefore the thermostat isn't used as the temperature sensor.

Current temperature - Room temperature where the Sensor is located, remote or at the thermostat location. When a remote sensor is installed, the thermostat will only use the remote sensor for displayed and operational temperatures.

Temperature Scale - Temperature Units of measure options:
F (Fahrenheit) or C (Celsius)

Temperature Set Point - Displays the user selected room temperature.

HVAC State - Displays the A/C or type of Heat currently running.

HVAC Mode - Displays the user selected HVAC option.

Fan State - Displays when the fan is running.

Fan Setting - Displays the user selected fan options.

Knob - Rotate the Knob to scroll for access to other user selected options.
- Rotate the Knob clockwise to increase temperature setting and counter-clockwise to decrease temperature setting. (All other settings will not be displayed during temperature selection.)
- Press Knob to immediately accept any setting changes.

Set point Setting

To select a set point, the thermostat must be in any Heat or Cool setting other than 'Off'. Once a setting has been selected and the set point temperature is visible, rotate the knob. The display will now blink the set point temperature and adjust it according to the rotation direction (clockwise for increase and counterclockwise for decrease of the set point). When the desired set point is displayed, press the knob. The display will revert to the previously displayed information with the new set point. Once the thermostat returns to this screen, it will energize the needed appliance to satisfy the new settings.

Temperature Scale Change

The thermostat can display temperatures in either Fahrenheit or Celsius. To change the temperature scale, press and hold the knob until the display changes (4 seconds). The display will show the current temperature, the set point temperature (if it was previously displayed), and the temperature scale options with the currently selected scale blinking. Rotate the knob to change the selection. Once the desired scale is blinking, press the knob to accept the changes. Upon selecting the new temperature scale, the temperature(s) displayed will update values accordingly.

Retained Settings

Temperature Set Points (for cool, cool+heat, and heat: electric and gas) and Temperature Units will be retained when the power is lost, or the thermostat is rebooted.

Settings are stored automatically upon any changes made to any set point or temperature unit change.

HVAC Mode Descriptions

The table below describes which outputs are live by the thermostat in the specified HVAC mode.

HVAC Mode	Live Outputs
Off	HVAC outputs are disabled, fan is based on selection
Cool	Compressor and selected fan speed
Elec Heat	Electric heat (heat pump) and gas heat
Gas Heat	Gas Heat
Heat	
Dry Cool ¹	Dehumidification Mode: Compressor and low fan speed
Cool+Heat ²	Cooling Cycle: Compressor and selected fan speed
	Heating Cycle: Electric heat (when Dip switch 2 is on), gas heat and Fan

¹When in Dry Cool mode, only the compressor and fan in low speed operate. The timing of the Dry Cool mode is dependent on the room temperature and the set temperature.

²While in Cool+Heat mode, a 15 minute timer (auto change-over timer) will prevent the opposite HVAC mode from operating if the set temperature and room temperature remain within 2° F. This timer is automatically disabled upon changing the HVAC mode, fan mode, or set point temperature.

Set Temperature Range

Mode	Temperature Range	
	°F	°C
Cooling (set)	33° F to 99° F	1° C to 37° C
Heating (set)	33° F to 99° F	1° C to 37° C

If the current temperature is below 32° F (0° C), the display will show "LO" and if the temperature is above 99° F (37° C), the display will show "HI".

Dry Mode Temperature Range

Starting Condition	Timing
Current Temperature Higher than Set Point + 1° F	Time On: 15 minutes
	Time Off: 3 minutes
Current Temperature Less than or equal to Set Point + 1° F	Time On: 6 minutes
	Time Off: 15 minutes

Elec Heating Mode

When in electric heating (heat pump) mode some extra rules are applied. If the electric heating mode is selected and the current temperature ever reaches 5° F below the set point temperature, the gas heat mode will turn on in conjunction with the electric heat. When the gas heat must turn on to assist the electric heat, the electric heat gets a strike. Once the electric heat gets three strikes and that heating cycle has completed, it is disabled for 1 hour and 45 minutes. When the electric heat is disabled in this way, the gas heat becomes the primary source of heat. After 1 hour and 45 minutes, the electric heat becomes the primary source again. If the electric heat gets a strike but completes a heating cycle without the assistance of the gas heat, the electric heat will lose a strike. If the electric heat is running for 20 minutes without the gas heat needing to turn on, the strike counter is reset. Whenever the gas heat is running in this mode, the 'Elec' segment will flash.

Compressor/Elec Heat Short Cycle Protection (DOB)

To protect the compressor/heat pump from short cycling, a 3 minute delay will be initiated for both the compressor and electric heat outputs after either output's demand is satisfied. During this 3 minute delay, if there is a demand for the compressor or electric heat, the HVAC state segment will blink according to the selected mode. Once the delay has expired, the thermostat will resume normal operation.

Sleep Mode

Sleep mode is activated automatically 10 seconds after the last user interaction. In sleep mode the LCD will dim, and power usage will drop. The first user interaction (rotation, knob press, or knob hold for 4 seconds) will wake up the device and brighten the display.

Auto Accept

If the user was changing any setting (HVAC mode, fan mode, set point, or temperature units) and the knob was not pressed to accept the new selection, the thermostat will automatically accept the new selection after 7 seconds and apply any changes.

Manual Reboot

The thermostat can be manually rebooted by pressing and holding the knob for 12 seconds. When the knob is held for 4 seconds, the thermostat will go to the temperature scale selection screen, after another 4 seconds, the thermostat will begin a count down. Once the countdown reaches 0 and the display turns off, the device will wait for the knob to be released. Upon the release of the knob, the device reboots.



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