

# sensi

by **COPELAND**



## SENSI TOUCH 2 SMART THERMOSTAT

### Humidification & dehumidification setup guide

## 1. INSTALLATION – COMPATIBILITY AND WIRING

Refer to our wiring diagrams for more information.

### Compatibility

Sensi Touch 2 is compatible with low voltage wired humidification and dehumidification systems. To set the thermostat up for humidity control, configure Sensi for additional accessories in the HVAC Equipment settings. Then you can adjust the humidity control setpoint from the thermostat or in the Sensi app. Cooling systems without a dehumidification option can also use our Optimal Dehumidification feature that allows overcooling to increase dehumidification.

### Humidity Control

When the thermostat is configured for a humidifier the ACC+/- terminals use 1 or 2 wire control depending on how the humidifier is powered.

#### 1 WIRE ACCESSORY CONTROL

This is used for systems where the HVAC system transformer is powering the humidifier.

During a heating cycle, if the humidity % is below the humidity setpoint, the thermostat will **energize the ACC+ terminal** signaling the humidification equipment to turn on and add moisture to the air stream.

**Important:**

For 1 wire accessory control the dipswitch on the back of the thermostat should be set to **System**.

#### 2 WIRE ACCESSORY CONTROL

This is used for systems where the humidifier has its own transformer.

Low voltage power from the humidifier transformer is applied to the ACC- terminal on the thermostat. During a heating cycle, if the humidity % is below the humidity setpoint, the thermostat will close **a set of low voltage dry contacts between ACC- and ACC+** sending power back to the humidifier solenoid or control circuit.

**Important:**

For 2 wire accessory control the dipswitch on the back of the thermostat should be set to **Accessory**.

# Dehumidify Control

## OPTIMAL COMFORT – WIRED DEHUMIDIFICATION

When the thermostat is configured for dehumidification, the W2/\* terminal can control compatible dehumidification systems. During a cooling cycle, if the humidity % is above the humidity setpoint, the thermostat will **de-energize the W2/\* terminal** signaling the dehumidification equipment to lower the fan blower speed. The slower dehumidification fan speed allows more condensation removal from the air stream resulting in less humidity.

## OPTIMAL DEHUMIDIFICATION – OVERCOOLING

Cooling systems without a dehumidifier can use our Optimal Dehumidification feature that allows the thermostat to overcool to increase dehumidification.

During a cooling cycle, if the humidity % is above the humidity setpoint, the thermostat will cool below the current cooling setpoint by a maximum of 3° to help remove excess humidity.

## Wiring

Refer to the terminal designations chart below for the proper connections. Wiring diagrams provided at the end of this document for installation.

| SENSI THERMOSTAT | CONVENTIONAL SYSTEM CONNECTION                                                                                                                                                  | HEAT PUMP SYSTEM CONNECTION                                                                   |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| RC <sup>†</sup>  | Power for cooling, 24V                                                                                                                                                          | Power for cooling, 24V                                                                        |
| RH <sup>†</sup>  | Power for heating, 24V                                                                                                                                                          | Power for heating, 24V                                                                        |
| C                | Common wire, 24V                                                                                                                                                                | Common wire, 24V                                                                              |
| Y                | 1st stage cool                                                                                                                                                                  | 1st stage heat and cool (compressor)                                                          |
| Y2/*             | 2nd stage cool                                                                                                                                                                  | 2nd stage heat and cool                                                                       |
| W/E              | 1st stage heat                                                                                                                                                                  | 1st stage auxiliary/emergency heat (2nd stage heat)                                           |
| W2/*             | 2nd stage heat + dehumidification                                                                                                                                               | 2nd stage auxiliary/emergency heat (3rd stage heat) + dehumidification                        |
| G                | Indoor blower (fan)                                                                                                                                                             | Indoor blower (fan)                                                                           |
| O/B              | Application for heat pump reversing valve is listed in HP designations. Zone panel or 3-wire hot water zone valve connection. (configurable as O, B or 6 in the installer menu) | Heat pump changeover (reversing valve) connection (configure as O or B in the installer menu) |
| ACCESSORY (+/-)  | Used for humidifiers                                                                                                                                                            | Used for humidifiers                                                                          |

# Configuration

After wiring, set up humidification/dehumidification control capability at the thermostat on or off.

- Tap **Menu icon**
- Tap **Advanced Setup**
- Tap **HVAC Equipment**
- Tap **Configure**
- Tap **Additional Accessories**
- Tap the option for your wired accessory to **Yes**
- Tap **Save**



If you're unable to tap Yes or Save the settings for wired dehumidification, the thermostat may be configured for two stage heating.

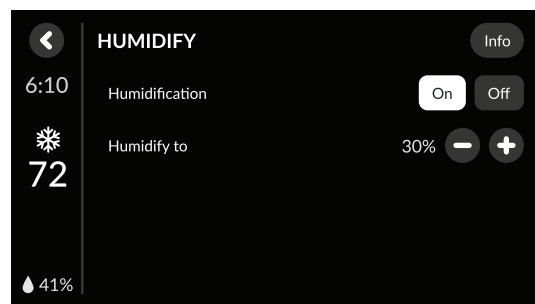
## Set Up the Feature

You can set up the feature on the thermostat itself or in the Sensi app.

## At the thermostat:

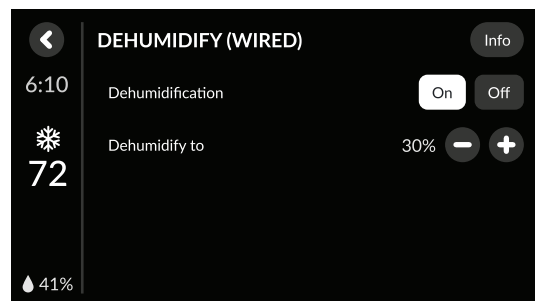
### HUMIDITY CONTROL

- In the **Advanced Setup** screen, tap on **Humidify**
- Make sure Humidification is turned **On**
- Use the **+/- buttons** to adjust the humidity percentage that you want to control to in the home. It can be set in increments of 5%
- Tap the **back arrow** when you're done



### DEHUMIDIFY - WIRED

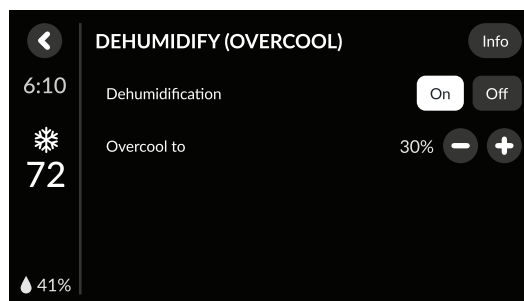
- In the **Advanced Setup** screen, tap on **Dehumidify**
- Make sure Dehumidification is turned **On**
- Use the **+/- buttons** to adjust the humidity percentage that you want to control to in the home. It can be set in increments of 5%
- Tap the **back arrow** when you're done



## DEHUMIDIFY CONTROL – OVERCOOLING

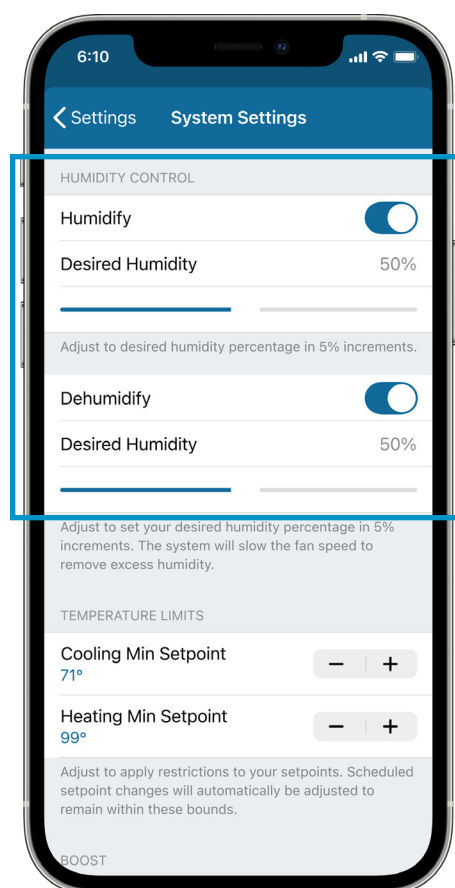
This does not require a wired connection and does not require you to configure accessories in the HVAC Equipment menu.

- In the **Advanced Setup** screen, tap on **Dehumidify**
- Make sure Dehumidification is turned On
- Use the **+/- buttons** to adjust the humidity percentage that you want to control to in the home. It can be set in increments of 5%
- Tap the **back arrow** when you're done



In the Sensi app:

- Tap on your **thermostat name**
- Tap on the **settings gear**
- Tap on **System Settings**
- Scroll down to the **Humidity Control** to adjust either the Humidification setpoint or the Dehumidification setpoint. Tap the **back arrow** to save changes



## Frequently Asked Questions

| FAQ                                                                                 | ANSWER                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| When can I get the update for humidity control?                                     | As soon as you connect the thermostat to Wi-Fi and register it to the customer's account, a firmware update will trigger with the appropriate updates.                                                                                                                                                                                                                                                                                            |
| What terminals should I use to enable humidity control?                             | ACC+/- terminal(s) are for humidification control, and the W2/* terminal is for dehumidification control.                                                                                                                                                                                                                                                                                                                                         |
| What types of humidifiers and dehumidifiers are compatible?                         | <p>Humidifiers – Sensi is designed to control typical 24VAC humidifiers. Currently it does not support humidifiers designed to cycle when the heat is not operating.</p> <p>Dehumidifiers – Sensi is designed to control 24VAC dehumidification systems that lower the fan speed when the thermostat de-energizes the dehumidification terminal. Currently it does not support dehumidifiers designed to cycle when the A/C is not operating.</p> |
| What is an appropriate humidity control setpoint?                                   | Depending on the outdoor temperature, the ideal indoor humidity level is between 30-50% RH. In cold weather, if condensation appears on your windows, lower the humidity setpoint.                                                                                                                                                                                                                                                                |
| What is Optimal Dehumidification - Overcooling to Dehumidify?                       | On cooling systems without a dehumidifier, this feature allows Sensi to remove extra condensation by running a cooling cycle as much as 3° below the temperature setpoint. Systems with "dehum" terminals on the furnace/air handler control board or wired dehumidifiers will use those capabilities rather than overcooling.                                                                                                                    |
| Why is my system unable to reach my humidity setpoint?                              | During extremely cold and dry or hot and humid climates, your humidifier or dehumidifier may not be able to increase or decrease the humidity enough to reach your setpoint depending on the size of your equipment.                                                                                                                                                                                                                              |
| How do I know how to correctly set the ACC terminal dipswitch for humidity control? | <p>If your humidifier is being powered by your HVAC system control board, and you only have one wire running to the thermostat (ACC+), set the dipswitch for "System."</p> <p>If your humidifier is being powered by the accessory transformer, and you have two wires running to the thermostat (ACC+ and ACC-), set the dipswitch for "Accessory."</p>                                                                                          |

# Wired Humidification

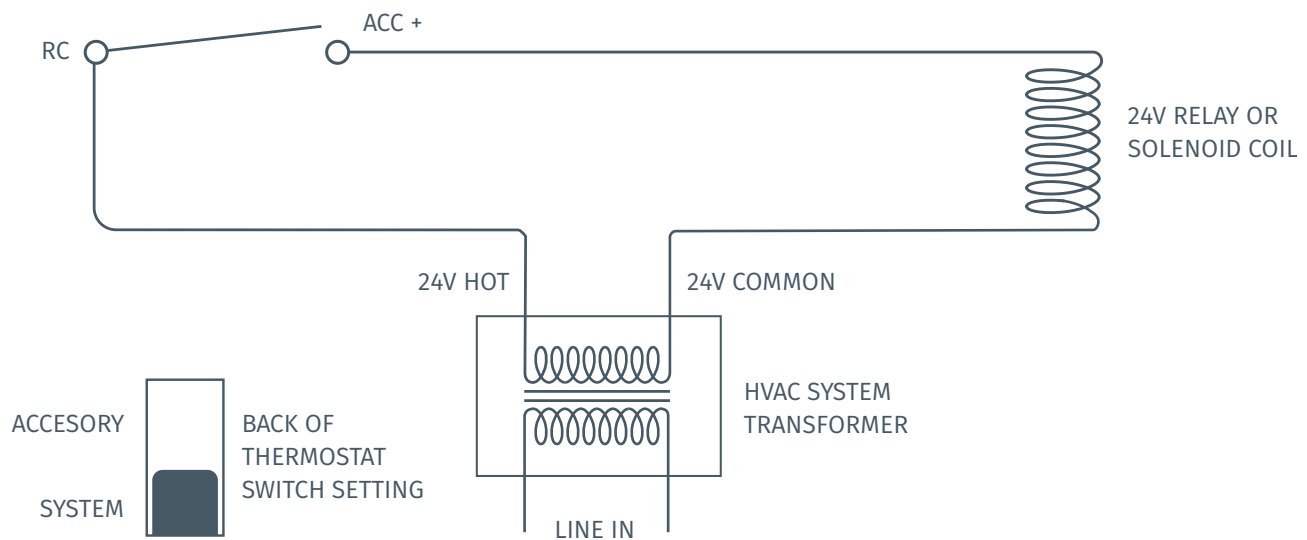
## 1 WIRE, SYSTEM POWERED

On a call for Humidification the thermostat sends 24V power out on terminal ACC+ by closing an internal switch between the thermostat terminals RC and ACC+.

When set for 1 wire control the other ACC terminal (ACC-) is isolated and not used.

For 1 wire control set the switch on the back of the thermostat to "System" and use the installer menu to select Humidifier (Yes).

## 1-WIRE ACCESSORY



### **Tech tip:**

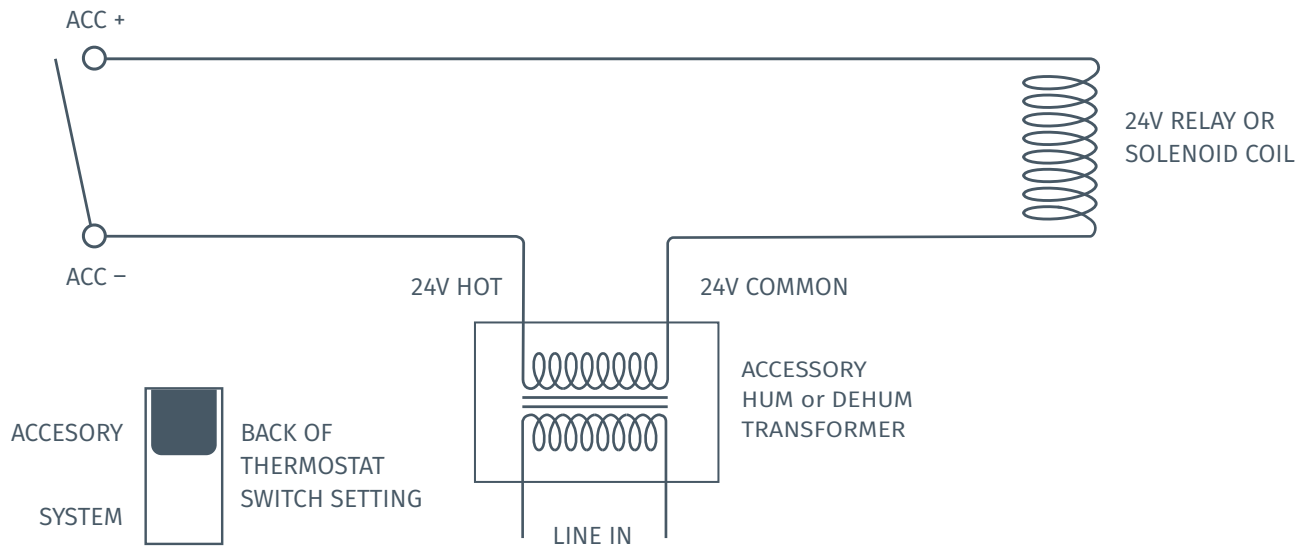
*1 wire control is typically used to energize one side of a solenoid coil that already has the other side of a relay or solenoid coil attached to the common on the 24 VAC HVAC transformer.*

## 2 WIRES, ACCESSORY POWERED

On a call for Humidification the thermostat closes a set of low voltage dry contacts between ACC+ and ACC-. Low voltage power from the humidifier transformer is to be applied to ACC- and on call for humidification switches back out on ACC+ to energize a solenoid or other device.

For 2 wire control set the switch on the back of the thermostat to "Accessory" and use the installer menu to select Humidifier (Yes).

### 2-WIRE ACCESSORY



#### **Tech tip:**

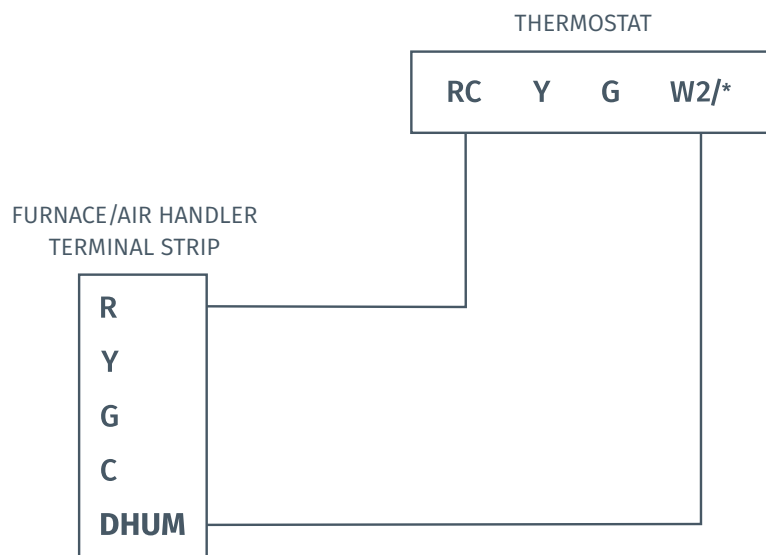
2 wire control is typically used on systems where the accessory Humidifier has its own built-in transformer and is not powered by the HVAC transformer connected to the thermostat. ACC+ and ACC- provide low voltage humidistat switch contacts that close on call for humidification.

## Wired Dehumidification

Thermostat terminal W2/\* de-energizes on call for dehumidification to lower the fan speed. The DHM/DHUM terminal is only used on systems with a compatible dehumidification feature that have the required terminal connection on the control module or have a relay installed to lower fan speed.

**Tech tip:**

*Wired dehumidification cannot be configured with two stage heating systems. If you're unable to configure the thermostat for wired dehumidification, use the installer menu to make sure the HVAC Equipment for Indoor is set for single stage.*



## RELAY INSTALLED

A relay can be installed as shown below to switch fan speed to the next lower speed on a call for dehumidification from the thermostat. The reduction in air flow allows the coil to remove more humidity from the air. The relay should be rated for the blower motor load. Since this configuration reduces the air flow in cooling, the anti-freeze-up control or equivalent is recommended to prevent the air conditioning coil from freezing due to low air flow, dirty filters, low refrigerant pressure, etc.

