CURRENT-SENSING MAKEUP AIR SENSOR

Model: C-Sensor

The C-Sensor Electronic Makeup Air Sensor is intended for use as an accessory to the HHSC+ Ventilation Control and FAD fresh air damper system, and/or optional E-Sensor Enthalpy Damper Control or T-Sensor Temperature Damper Control (items not included). The C-Sensor senses the operation of air-exhausting devices (such as range hoods, dryers, bathroom fans, central vacuum systems etc.), and acts as a switch to provide a 24 VAC input signal to the HHSC+ Ventilation Control, which then operates the FAD fresh air damper and activates the HVAC central fan, to draw air into the house and provide makeup air for the exhausting device. The C-Sensor may also be used in a stand alone makeup air system to control a 24V fresh air damper.

ITEMS INCLUDED IN KIT:
(1) Model C-Sensor Electronic Makeup Air Sensor, with electrical junction box
(2) wiring strain reliefs

INSTALLER-SUPPLIED ITEMS:
- **24V wiring (min. 22 AWG, max. 50', min. 18 AWG, max 150')**
- **Wiring connectors**

READ THESE INSTRUCTIONS CAREFULLY AND COMPLETELY BEFORE PROCEEDING WITH THE INSTALLATION.

This device **MUST** be installed by a qualified agency in accordance with the manufacturer's installation instructions. The definition of a qualified agency is: any individual, firm, corporation or company which either in person or through a representative is engaged in, and is responsible for, the installation and operation of HVAC appliances, who is experienced in such work, familiar with all the precautions required, and has complied with all the requirements of the authority having jurisdiction.

Please retain these instructions after installation.

Installed By: _____   Phone: _____   Installation Date: _____

INSTALLATION

Figure 1

1. Install the HHSC+ Ventilation Control, and low-voltage wiring to the Makeup Air Sensor: Follow the instructions for installation included with the HHSC+ and refer to Wiring Diagrams below to determine the desired wiring configuration. Avoid routing the low-voltage wiring near line-voltage circuits and high-current devices.

   Caution: Before beginning the installation, disconnect electrical power to the exhausting device and the HVAC system, and verify that there is no voltage from terminal R to C on the HHSC+.

   Warning: Follow all applicable wiring codes applying to the installation of line voltage branch circuits and low voltage, low current signal wiring. Installation must be performed or inspected by a licensed electrician or authority having jurisdiction over electrical installations.
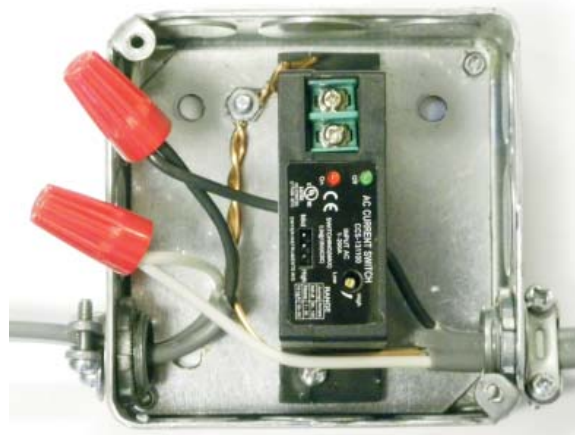
2. Install the Makeup Air Sensor: NOTE: It is recommended that the Makeup Air Sensor be installed on a dedicated branch circuit feeding only the exhausting device for which makeup air is to be provided. If any other devices are served by the branch circuit, the sum of their current draws must be significantly less than the current draw of the exhausting device when operating in a manner requiring makeup air.

   Figure 2

   a. Remove the cover from the Makeup Air Sensor, and install the sensor as an electrical junction box on the dedicated branch circuit, in an acceptable and accessible location.

   Caution: the junction box must be properly connected to an earth ground using the provided grounding connection!

   b. Inside the Sensor junction box, select either the hot leg conductor wire (typically black) or neutral leg conductor wire (typically white) serving the exhausting appliance. Note: it is preferable to separate a conductor carrying power to the fan motor only, if possible, while meeting all applicable wiring codes.

   c. Pass the selected conductor through the large hole in the Makeup Air Sensor switch (see Figure 1 for example of wiring).

   d. Complete any required wiring connections within the junction box, and install the box cover.

3. Connect the low-voltage wiring from the Makeup Air Sensor low-voltage terminals (see Figure 2) to HHSC+ Ventilation Control AUX-IN & R terminals, and/or E-Sensor or T-Sensor Damper Control, if installed: Refer to E-Sensor/T-Sensor Installation and Operation Instructions for details pertaining to system configuration selection and specific operation of the system.
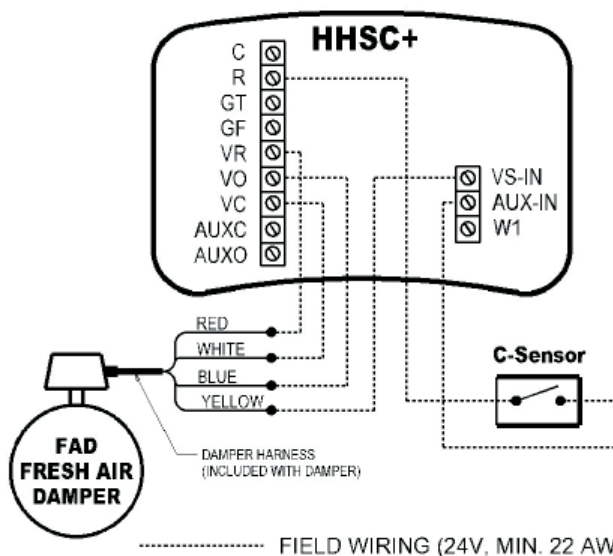
4. Adjust the Makeup Air Sensor:

   a. Restore power to the exhausting device, and operate the device for which makeup air is desired or required. If the device is multi-speed, operate on a speed rated at or above the air flow amount for which makeup air is desired (typically 400 cubic feet/minute, or cfm). The indicator LED lamps on the Sensor should glow either green or red.

   b. Turn on any equipment or appliances that may be served by the branch circuit feeding the exhausting appliance.

   c. Turn the adjusting screw on the Sensor to the left until only the green "Off" LED lamp glows.

   d. Turn the adjusting screw to the right just until the red "On" LED lamp glows. Turn the screw slightly more to ensure operation under lowered-voltage conditions.

5. Restore power to the HVAC system: The HHSC+ ventilation control should activate the FAD damper to open, and activate the HVAC central fan if it is not being caused to run by the thermostat. This will continue as long as the exhausting device is operated.
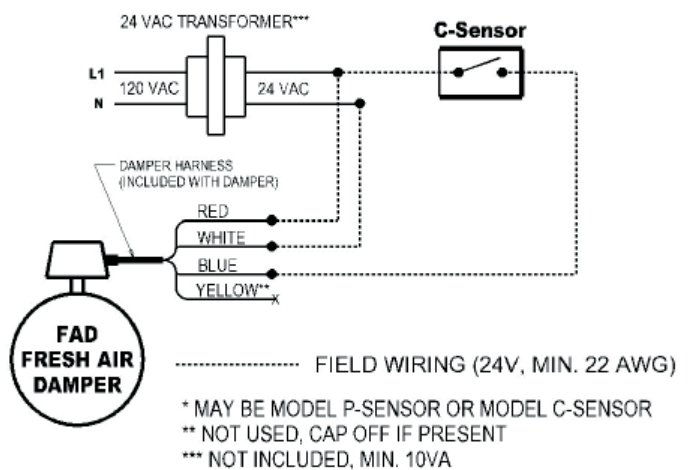
TROUBLESHOOTING

- Neither red nor green LED on the Makeup Air Sensor glows when the exhausting appliance is operating: check that only one current-carrying wire to the device is passed through the hole in the Sensor. If this is correct, loop another turn of the wire through the hole in the Sensor. The Sensor will gain sensitivity with every extra loop of wire passing through the hole.
- The red "On" lamp on the Makeup Air Sensor blinks on and off: turn the Makeup Air Sensor adjusting screw more to the right until it glows steadily.
- The FAD damper does not open: check the modular plug connection to the damper, and for voltage from terminal R to C, VO to C, and AUX-IN to C on the HHSC+.
- The FAD damper does not close when the green "Off" LED is on: check the mode switch on the damper motor and ensure it is in the Auto position, and for voltage from red to white on the FAD.

WIRING DIAGRAM A

HHSC+

* HVAC AND OTHER WIRING NOT SHOWN
** MAY BE MODEL P-SENSOR OR MODEL C-SENSOR

FIELD WIRING (24V, MIN. 22 AWG)

WIRING DIAGRAM B

24 VAC TRANSFORMER***

FIELD WIRING (24V, MIN. 22 AWG)

* MAY BE MODEL P-SENSOR OR MODEL C-SENSOR
** NOT USED, CAP OFF IF PRESENT
*** NOT INCLUDED, MIN. 10VA

For Field Controls warranty information, please visit www.fieldcontrols.com