Microprocessor Based Temperature Sensor

Installation and Operation

#NSA-HH/CP-RSO-RJ6-TUC2-C – 11/15/2019

Overview

The microprocessor based NSA-HH/CP-RSO-RJ6-TUC2-C can indicate room temperature, setpoint, fan speed, and occupied or unoccupied status with corresponding signals sent to your Direct Digital Control System (DDC System). This unit supports single sensor operation for several common sensor types and it provides the flexibility to indicate several options. Additionally, many options are field adjustable via the key-pad menu. The sensor supports single temperature sensor operation for several common sensor types and it provides the flexibility to choose from numerous setpoint output options.

Part Numbers

NSA-HH/CP-RSO-RJ6-TUC2-C

Specifications

Supply Voltage	+12-40 VDC (0-1V, 0-5V, 0.5-4.5V) | +18-40 VDC (0-10V, 2-10V, 0-20 mA, 4-20 mA) | 20-28 VAC
Supply Current	Current Output: 100 mA maximum | Voltage & Resistive Output: 16 mA maximum
Temperature Accuracy	+/-1oF (+/- 0.56oC)
Operating Temperature Range	40oF to 104oF (5oC to 40oC)
Operating Relative Humidity Environment	0 to 95% Relative Humidity (non-condensing)
Analog Temperature Sensor Outputs	Resistive, 0-1V, 0.5-4.5V, 0-5V, 1-5V, 0-10V, 2-10V, 0-20 mA, 4-20 mA
Setpoint Accuracy	Resistance: +/-5% Full Scale Output, Analog: +/-2% Full Scale Output
Analog Setpoint Outputs	Resistive, 0-1V, 0.5-4.5V, 0-5V, 1-5V, 0-10V, 2-10V, 0-20 mA, 4-20 mA
Product Dimensions	(H) 4.56” (W) 3.00” (D) 1.26”

Installation

Precautions

- Remove power before wiring. Never connect or disconnect wiring with power applied. Do not allow live wires to touch the circuit board.
- An isolation transformer is recommended when powering the device with 24vac.
- Do not run the wiring in any conduit with line powered wiring.
- Failure to wire devices with the correct polarity when using a shared transformer may result in damage to any device powered by the shared transformer.

Mounting

Carefully separate the cover from the base by pulling the cover and base apart towards the bottom of the device. The hex screw may need to be turned in to release the cover.

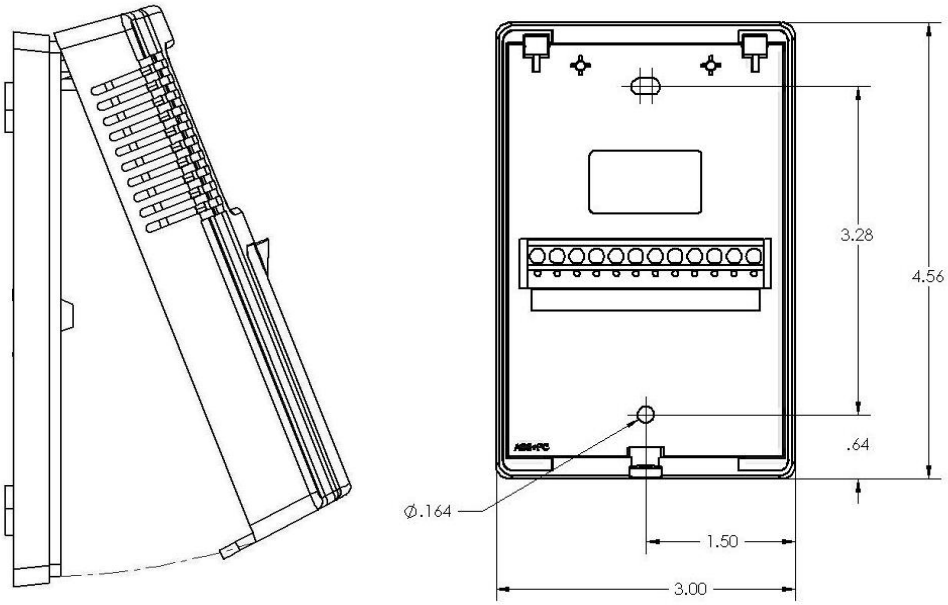


Figure 1

Route the wires through the access hole in the center of the base and screw them into the terminal blocks. Refer to the wiring instructions to make the necessary connections. Attach the base directly to drywall, or to a standard 2” x 4” junction box using the hardware provided. After wiring, attach the cover to the base and turn out the hex screw until the cover cannot be removed.

Wiring Instructions

A 16 to 22 AWG shielded cable is recommended for all sensor installations. Be sure to connect the cable shield to the ground at the controller only. The number of wires needed depends on the application, with 3 wires minimum required to support the outputs of the unit. Generally, one wire is required for each output, one wire for power, and one wire for ground. All outputs are common ground referenced.

NOTES

- Units do not have RH or RHS terminal locations loaded.
- If the unit has any output configured with a 10V or Current output, the voltage at the +V terminal must be at least +18 VDC.

+V - +12 to +40 VDC or 20 to 28 VAC

COM - Ground or signal common, 20 to 28 VAC

T - Temperature sensor signal to controller

TS - Temperature set point signal to controller

O/R - Override signal to controller

F/A - Fan signal to controller

OFB - Occupied feedback signal from controller

S1 - 3.5mm phone jack ring / Digital input or output

S2 - 3.5mm phone jack tip / Digital input or output

S3 - 3.5mm phone jack shield

RH - RH signal to controller

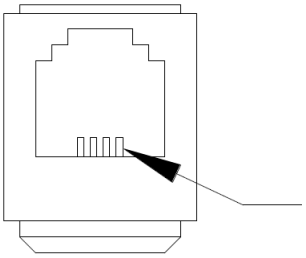
RHS - RH set point or system signal to controller

Communication Jack Wiring - Modular Telephone Jack

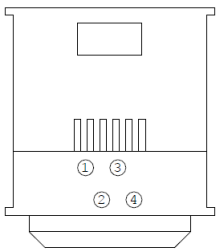
Before mounting the base to the wall, make the appropriate connections to the communication jack as described below. The number of wires needed depends on the application. Using the provided wire nuts, attach the required wires to the proper connector pins used by your application.

4 Pin 4 Connector

Front View



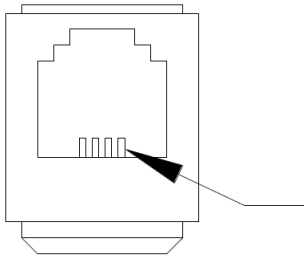
Rear View



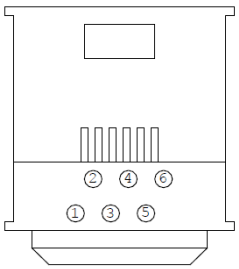
WIRE NUMBER:	WIRE COLOR:
1	BLK
2	RED
3	GRN
4	YEL

6 Pin 6 Connector

Front View



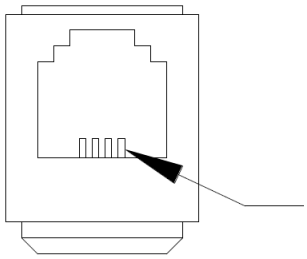
Rear View



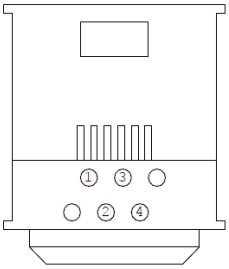
WIRE NUMBER:	WIRE COLOR:
1	BLU
2	BLK
3	RED
4	GRN
5	YEL
6	WHT

6 Pin 4 Connector

Front View



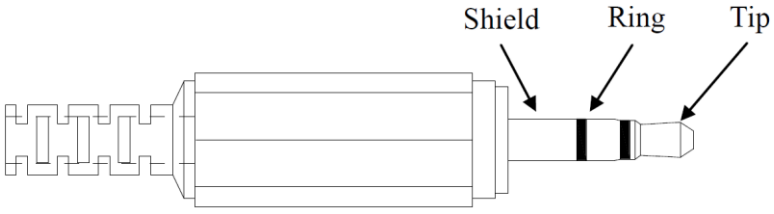
Rear View



WIRE NUMBER:	WIRE COLOR:
1	BLK
2	RED
3	GRN
4	YEL

3.5mm Stereo Jack

Attach the required wires to the proper terminal locations. The unit supports 3 signal wires, ring, tip, and shield. The number of wires needed depends on the application.

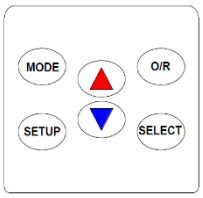


Terminal Block:	Jack Connections:
S1 Terminal	Ring
S2 Terminal	Tip
S3 Terminal	Shield

Operation

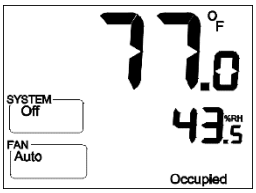
Keypad

The keypad comes in a 2 button, 3 button, 4 button, 5 button, or 6 button version. A 6 button keypad is needed for fan or system mode. A 3 button or 5 button keypad is needed for override mode.



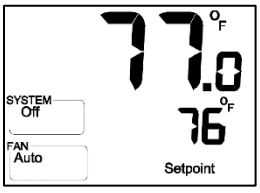
Normal Mode

The LCD can display temperature, RH, occupied status, system mode, and fan mode. The display configuration can be setup when ordered or changed through the setup menu. The backlight will turn on when the any key is pressed and will turn off 10 seconds after the last key press.



Setpoint Mode

Press ▲ or ▼ to get into setpoint mode and change the setpoint. If a temperature and RH setpoint are used, pressing SELECT or ▲ and ▼ will switch the large numbers between temperature and RH. If temperature is displayed in the large numbers, the temperature setpoint will adjust when ▲ or ▼ is pressed. If RH is displayed in the large numbers, the RH setpoint will adjust when ▲ or ▼ is pressed. If no keys are pressed for 10 seconds the unit will automatically return to normal operation.

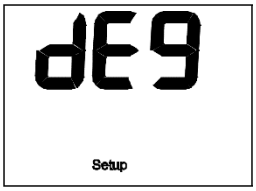


Fan/System Mode

Press MODE to change the fan or system setting. The fan or system setting will start blinking after MODE is pressed. Press SELECT or ▲ and ▼ to switch between the fan and system modes. The mode that is blinking will change when ▲ or ▼ is pressed. Press MODE to return to normal operation. If no keys are pressed for 10 seconds the unit will automatically return to normal operation.

Setup Mode

Press and hold SETUP for 5 seconds or press and hold ▲ and ▼ for 10 seconds to enter setup mode. Once in the setup menu, ▲ or ▼ will scroll through the setup menu. Press SELECT or ▲ and ▼ to enter menus. Press SELECT or ▲ and ▼ to save menu selections. Press SETUP to return to the previous menu. If no keys are pressed for 15 seconds the unit will automatically return to normal operation.

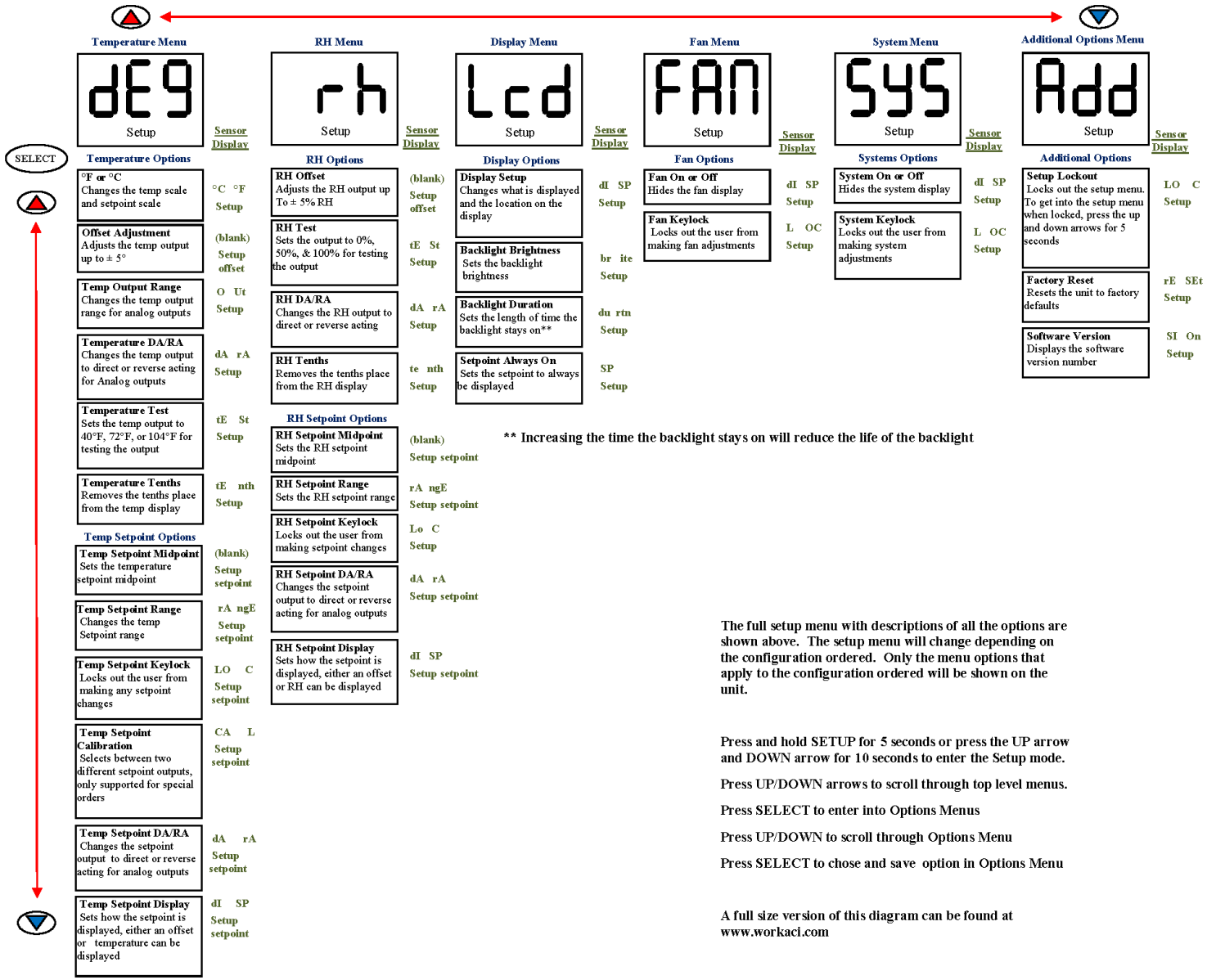


Setup Menu

The full setup menu with descriptions of all the options is shown on page 7. The setup menu will change depending on the configuration ordered. Only the menu options that apply to the configuration ordered will be shown. For instance, if no Fan or System were ordered then those menu options would not appear.

Setup Lockout

In the setup menu there is an option to lockout setup mode. This can be used if you do not want users to change the setup. Once the setup menu is locked, press ▲ and ▼ for 10 seconds to get into setup mode.



The full setup menu with descriptions of all the options are shown above. The setup menu will change depending on the configuration ordered. Only the menu options that apply to the configuration ordered will be shown on the unit.

Press and hold SETUP for 5 seconds or press the UP arrow and DOWN arrow for 10 seconds to enter the Setup mode.

Press UP/DOWN arrows to scroll through top level menus.

Press SELECT to enter into Options Menus

Press UP/DOWN to scroll through Options Menu

Press SELECT to chose and save option in Options Menu

A full size version of this diagram can be found at www.workaci.com