



AURORA

***Aurora Universal Protocol Converter (UPC)
Zone Sensors***

Submittal Data
English Language/IP Units
SD1582EW 06/18

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

ZS Series RNet Zone Sensors

ZS Series RNet Sensor Overview

The ZS Series line of intelligent zone sensors provides the function and flexibility you need to manage the conditions important to the comfort and productivity of the zone occupants. The ZS sensors are available in a variety of zone sensing combinations to address your application needs. These combinations include temperature, relative humidity, and indoor air quality (carbon dioxide or VOCs (Volatile Organic Compounds)). Designed to work with the Aurora UPC controllers the ZS sensor line includes the ZS Standard, ZS Plus, ZS Pro and ZS Pro-F.

The UPC uses a proprietary communication called Rnet to receive the space temperature from the zone sensor. This is done using (2) 18 AWG twisted pair unshielded cables for a total of 4 wires connected to the Rnet port. The sensor gets its power from the UPC controller and connecting multiple sensors to one UPC will allow for space temperature averaging. The UPC can support up to 5 ZS sensors. The sensors use a precise 10k ohm thermistor with less than 0.18°F drift over a ten year span, this allows for less maintenance or re-calibration after installation. The sensors also have a hidden communication port for connecting a Aurora Touch Interface or local laptop that provides access to the equipment for commissioning and maintenance. The table on page 18 shows the features of each of the four sensors that are currently available.



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RNet Sensor Nomenclature

Features	ZS Standard	ZS Plus	ZS Pro	ZS Pro-F
Temp, CO ₂ , Humidity, and VOC Options	√	√	√	√
Neutral color	√	√	√	√
Addressable / supports daisy-chaining	√	√	√	√
Hidden communication port	√	√	√	√
Mounts on a standard 2" by 4" electrical box	√	√	√	√
Occupancy status indicator		√	√	√
Push-button occupancy override		√	√	√
Setpoint adjust		√	√	√
Large, easy- to-read LCD			√	√
Alarm indicator			√	√
Motion Sensing (Future Use)			√	
Fan speed control				√
Cooling / Heating / Fan Only - Mode Control				√
°F to °C conversion button				√

Options/Part Numbers	ZS Standard	ZS Plus	ZS Pro	ZS Pro (motion)	ZS Pro-F
Temperature Only	ZS2-WFI02	ZS2PL-WFI02	ZS2P-WFI02	ZS2P-M-WFI02	ZS2PF-WFI02
Temp with CO ₂	ZS2-C-WFI02	ZS2PL-C-WFI02	ZS2P-C-WFI02	ZS2P-CM-WFI02	ZS2PF-C-WFI02
Temp with Humidity	ZS2-H-WFI02	ZS2PL-H-WFI02	ZS2P-H-WFI02	ZS2P-HM-WFI02	ZS2PF-H-WFI02
Temp with VOC	ZS2-V-WFI02	ZS2PL-V-WFI02	N/A	N/A	N/A
Temp, Humidity, CO ₂	ZS2-HC-WFI02	ZS2PL-HC-WFI02	ZS2P-HC-WFI02	ZS2P-HCM-WFI02	ZS2PF-HC-WFI02
Temp, Humidity, VOC	ZS2-HV-WFI02	ZS2PL-HV-WFI02	N/A	N/A	N/A

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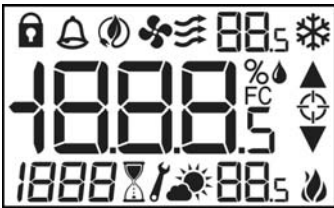
Contractor: _____ P.O.: _____
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ZS Series RNet Zone Sensors cont.

RNet Sensor Physical and Electrical Data

Sensing Element	Range	Accuracy
Temperature (on non-Humidity models)	-4° to 122° F (-20° C to 50° C)	±0.35° F (0.2° C)
Temperature (on Humidity models)	50° F to 104° F (10° C to 40° C)	±0.5° F (0.3° C)
Humidity	10% to 90%	±1.8% typical
CO ₂	400 to 1250 PPM 1250 to 2000 PPM	±30 PPM or ±33% of reading (greater of two) ±5% of reading plus 30 PPM
VOC	0 to 2000 PPM	±100 PPM
Power Requirements	Sensor Type	Power Required
Temperature Only Temperature with Humidity	All Models	12 Vdc @ 8mA
Temp with VOC, or Temp/VOC/Humidity	All Models	12 Vdc @ 60mA
Temp with VOC, or Temp/CO ₂ /Humidity	All Models	12 Vdc @ 15mA (idle) up to 190 mA (during CO ₂ measurement cycle)
Power Supply	A controller supplies the Rnet sensor network with 12 Vdc @ 210 mA. Additional power may be required for your application. See sensor ZS Installation Guide	
Communication	115 kbps Rnet connection between sensor(s) and controller 15 sensors max per Rnet network; 5 sensors max per control program	
Local Access Port	For connecting a laptop computer to the local equipment for maintenance and commissioning	
Environmental Operating Range	32° to 122° F (0° - 50° C), 10% to 90% relative humidity, non-condensing	
Mounting	Standard 4"x 2" electrical box using provided 6/32" x 1/2" mounting screws	
Motion Sensing	Sensor Type: PIR, Distance: 5 m, Detection range (HxV) 100° x 82° Movement speed: 0.8 to 1.2 m/s Detection object: 700 x 250 mm	

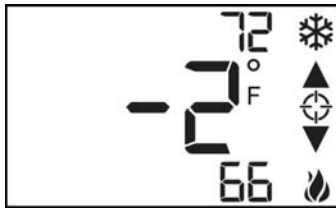
ZS Pro Display - All Segments



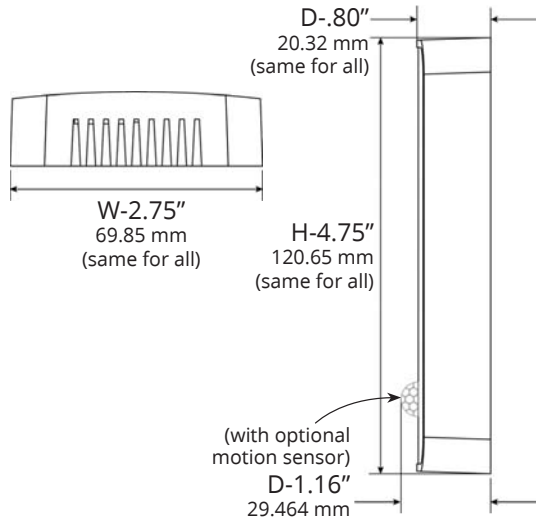
Home Screen



Setpoint Adjust



Info Screen - CO₂



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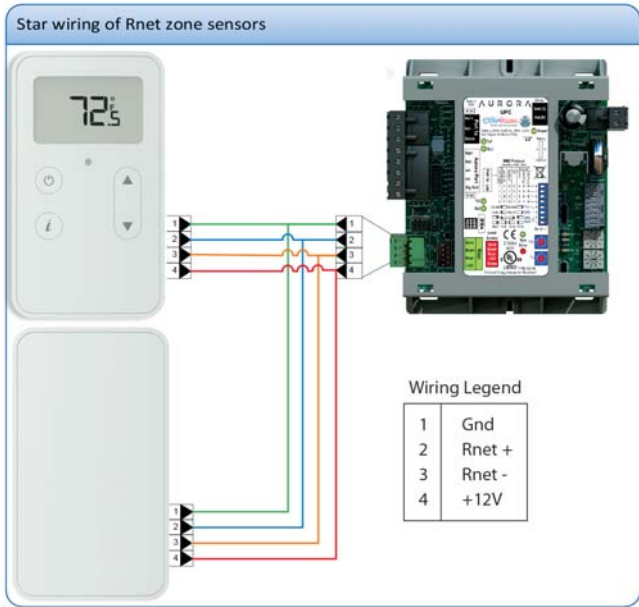
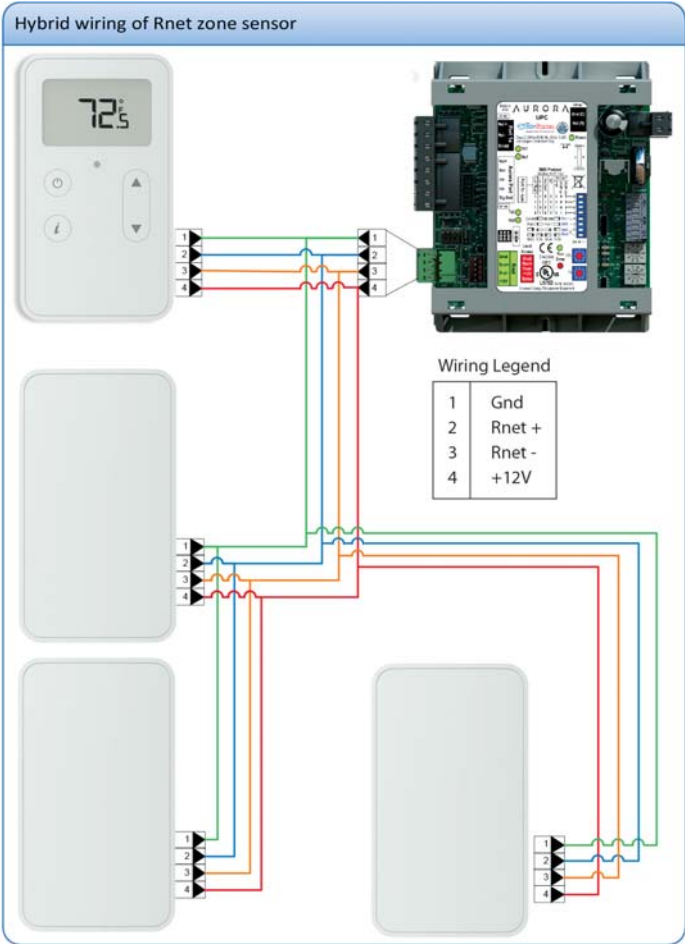
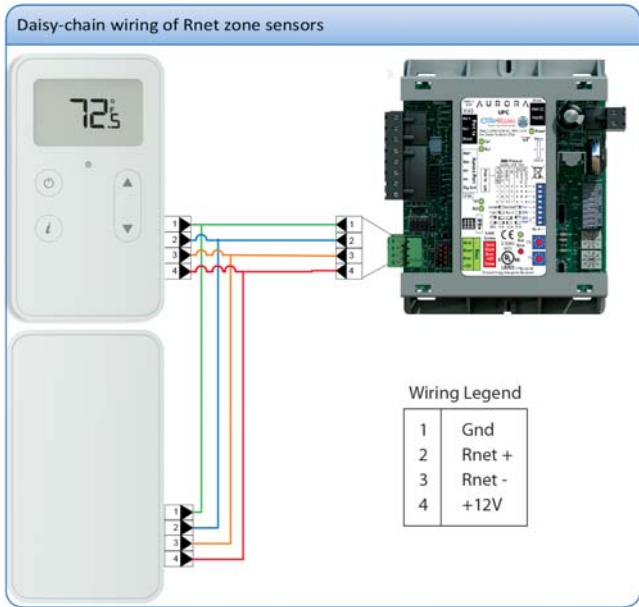
ZS Series RNet Zone Sensors cont.

Zone Sensor Wiring

Up to four zone sensors can be connected as shown. In the standard UPC application, zone sensor temperatures will automatically be averaged when using multiple zone sensors configured as shown below. It is possible to individually address and read each individual zone sensor but will require custom equipment profile software. Consult your WaterFurnace Commercial Representative for more information.

Using (2) 18AWG twisted pair unshielded communication cables connect the zone sensors to the UPC, be sure to use one twisted pair for the 12v supply and the grounding wire connections and the other twisted pair for the Rnet+ and Rnet- connection. If more than one sensor is required for the zone, connect the other sensors using one of the following schemes: Daisy-chain, Star, or the Hybrid method. Standard 18AWG thermostat wire is NOT recommended for use with the Rnet sensors.

Figure 5: Sensors Wiring



ZS Sensor Information

Zone Sensors can be wired in daisy chain as show or in a star or hybrid configuration. Maximum of 5 sensors per UPC. Maximum allowable load 210mA. See the UPC install manual for possible sensor combinations.

<table border="1"> <thead> <tr> <th>DIP Switch</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>NO</td> </tr> <tr> <td>2</td> <td>NO</td> </tr> <tr> <td>4</td> <td>NO</td> </tr> <tr> <td>8</td> <td>NO</td> </tr> </tbody> </table>	DIP Switch	Value	1	NO	2	NO	4	NO	8	NO	<p>Each ZS sensor must have a unique address, but the addresses do not need to be sequential. Use the DIP switches on the back of the ZS sensor to set an address from 0 to 4. (0 is the factory default.) Each DIP switch has the value shown in the figure to the left. Turn on as many DIP switches as you need so that their total value equals the address.</p>
DIP Switch	Value										
1	NO										
2	NO										
4	NO										
8	NO										

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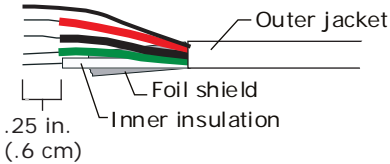
Rnet Wiring Specifications

NOTE: Use the specified type of wire and cable for maximum signal integrity.

Description	4 conductor, shielded or unshielded, CMP, plenum rated cable
Conductor	22 AWG (7x0096) bare copper if Rnet has only sensors 18 AWG (7x0152) bare copper if Rnet has a Aurora Touch Interface
Maximum length	500 feet (152 meters)
Insulation	Low-smoke PVC (or equivalent)
Color Code	Black, white, green, red
Shielding	If shielded, Aluminum/Mylar shield (100% coverage) with TC drain wire
UL temperature rating	32–167°F (0–75°C)
Voltage	300 Vac, power limited
Listing	UL: NEC CL2P, or better

To wire an ZS room sensor

1. Turn off the UPC's power.
2. Pull the screw terminal connector from the RS sensor.
3. Pull the screw terminal connector from the Rnet port.
4. Partially cut, then bend and pull off the outer jacket of the Rnet cable(s). Do not nick the inner insulation.



5. Strip about .25 inch (.6 cm) of the inner insulation from each wire.
6. Wire each terminal on the UPC's Rnet port to the terminal of the same name on the ZS room sensor.
7. Turn on the UPC's power.

NOTES

- If using shielded wire, connect the shield wire and the ground wire to the Gnd terminal.
- Maintain same polarity

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Revision Guide

Pages:	Description:	Date:	By:
Misc.	Updated Zone Sensor images, electrical/physical data, wiring diagram	31 May 2018	MA
All	First Published	Oct 30 2014	MA