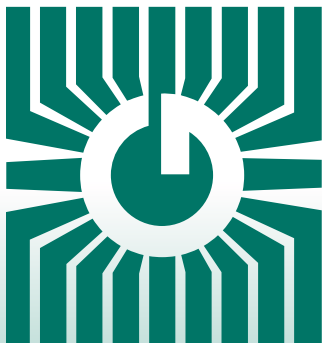


# GREYSTONE ENERGY SYSTEMS INC



## HUMIDITY/TEMPERATURE SENSOR BACnet® or Modbus Communication NT Series



### Precision humidity/temperature sensing/control

#### FEATURES:

- BACnet® or Modbus communication
- Temperature and RH monitoring
- Room, Duct or Outside
- LCD display (Room only)
- Several optional features available

*Peace of mind  
through reliable  
humidity/temperature  
monitoring*

GREYSTONE HAS AN ISO 9001 REGISTERED QUALITY SYSTEM

## DESCRIPTION (ROOM):

The NTRC Series Room Network Sensor features embedded BACnet® and Modbus communication and is available in several configurations for the most efficient monitoring and control solution. The basic unit accurately measures room temperature. Optional features include RH measurement, up/down setpoint control, local override function, control relay output, fan speed switch and a digital input.

The device connects to an RS-485 MS/TP network to offer a single-point solution for control of indoor air comfort. Features include a back-lit LCD and user menu for easy configuration, field-proven sensors and user input controls to add optional local setpoint and override functions at the same network point.

## SPECIFICATIONS (ROOM):

### General Specifications:

Power Supply.....	20-28 Vac/dc (non-isolated half-wave rectified)
Consumption.....	35 mA max @ 24 Vdc
Protection Circuitry.....	Reverse voltage and over voltage protected
Operation Conditions.....	0 - 50 °C (32 -122 °F), 0-95% RH, non-condensing
Wiring Connections.....	Screw terminal block (14 to 22 AWG)
External Dimensions.....	84 W x 119 H x 29 D mm (3.3" x 4.7" x 1.15")
Enclosure.....	White ABS, IP30 (NEMA 1)

### Communications Interface:

Hardware.....	2-wire RS-485
Software.....	Native BACnet® or Modbus MS/TP protocol, menu selectable
Baud Rate.....	Locally set from 300 to 76800
Network Address Range.....	Locally set to 0-127 for BACnet® or 1-255 for Modbus (Factory default is 3) (63 devices max on one daisy chain)

### LCD Display:

Resolution.....	0.5 ° or 1 °C/F (selectable), 1% RH
Size.....	38.1 W x 16.5 H mm (1.5" x 0.65"), 3 digit
Backlight.....	Auto-dimming, enable/disable via jumper
Displayed Values.....	Temperature Only, RH Only or Alternating Temperature/RH (RH requires optional RH Signal)

### Temperature:

Sensing Element.....	10K thermistor, ±0.2 °C (±0.4 °F)
Range.....	0 - 35 °C (32 - 95 °F)

### Optional RH Signal:

Sensing Element.....	Thermoset polymer based capacitive
Accuracy.....	± 2% RH
Range.....	0 - 100% RH, non-condensing
Resolution.....	1% RH
Hysteresis.....	± 3% RH
Response Time.....	15 seconds typical
Stability.....	± 1.2% RH typical @ 50% RH in 5 years

### Optional Override Switch:

User Interface.....	Front panel push-button available via BACnet® or ModBus
Override Status.....	Via BACnet® or ModBus. "OCC" segment lights on LCD

### Optional Setpoint Control:

User Interface.....	Front panel, up/down push-buttons available via BACnet® or Modbus
Setpoint Mode.....	Temperature (°C/°F) or RH, menu selectable (Factory default is Temperature & °C)
Adjustable Setpoint Range.....	10 - 30 °C, 50 - 86 °F or 10 - 80% RH, menu selectable (Factory default is 18 ° to 24 °C)
Minimum Span.....	4 °C/F or 10% RH
Temperature Setpoint Resolution.....	0.5 ° or 1 °, menu selectable (Factory default is 1°)

### Optional Fanspeed Switch:

User Interface.....	Side panel, 5 position switch available via BACnet® or Modbus
Indication.....	Off, Auto, Low, Mid, High switch position

### Optional Relay Output:

Contact Ratings.....	Form A contact (N.O.), 2 Amps @ 140 Vac, 2 Amps @ 30 Vdc
Relay Activation.....	Via BACnet® or Modbus

### Optional Digital Input:

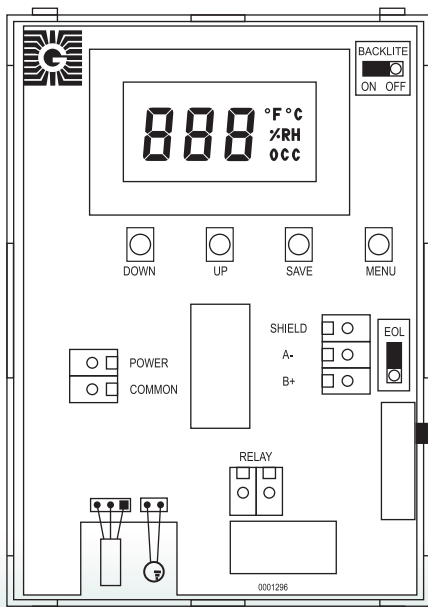
Input Type.....	Dry-contact only (relay contact), short to COMMON to activate
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## PRODUCT ORDERING INFORMATION (ROOM):

<b>MODEL</b>	<b>Description</b>					
<b>NTRC</b>	Network Room Sensor					
<b>CODE</b>	<b>LCD Display</b>					
<b>N</b>	Concealed					
<b>L</b>	Viewable					
<b>CODE</b>	<b>Configurations</b>					
<b>T</b>	Temperature Only					
<b>RH</b>	Temperature & Humidity					
<b>CODE</b>	<b>Setpoint Adjustment</b>					
-	No Setpoint Adjustment (Leave blank)					
<b>P</b>	Setpoint Adjustment					
<b>CODE</b>	<b>Momentary Override</b>					
-	No Override (Leave blank)					
<b>S</b>	Override Switch					
<b>CODE</b>	<b>Fan Speed Switch</b>					
-	No Fan Speed Switch (Leave blank)					
<b>F</b>	5 Position Fan Speed Switch					
<b>CODE</b>	<b>Relay Output</b>					
-	No Relay (Leave blank)					
<b>R</b>	Relay					
<b>CODE</b>	<b>Digital Input</b>					
-	No Digital Input (Leave blank)					
<b>D</b>	Digital Input					
<b>NTRC</b>	<b>L</b>	<b>RH</b>	<b>P</b>	<b>S</b>	-	-

Greystone Energy Systems Inc. reserves the right to make design modifications without prior notice.

## PCB/WIRING INFORMATION



Terminal	Function
POWER	From +20-28 Vac/dc of controller or power supply
COMMON	To GND or COMMON of controller
D INPUT	To dry contact output of device
B +	To + of communications bus
A -	To - of communications bus
SHIELD	To communications bus shield
RELAY	To digital input of controller

Some models do not have all features

## DESCRIPTION (DUCT/OUTSIDE):

The NT Series RH/Temperature Network Sensors use a highly accurate and reliable thermoset polymer based capacitance humidity sensor and curve-matched NTC thermistor temperature sensor together with embedded BACnet® or Modbus communication to provide the most efficient monitoring and control solution.

The NT Series sensors connect to an RS-485 MS/TP network to offer a single-point solution for control of air comfort.

The NT Series sensors are available in both duct and outside mounting configurations.

## SPECIFICATIONS (DUCT/OUTSIDE):

### General Specifications:

Power Supply.....	<b>BACnet®:</b> 24 Vac/dc ± 10% (non-isolated half-wave rectified) <b>Modbus:</b> 15 - 30 Vac/dc (non-isolated half-wave rectified)
Consumption.....	<b>BACnet®:</b> 25 mA max @ 24Vdc <b>Modbus:</b> 10 mA max @ 24 Vdc
Protection Circuitry.....	Reverse voltage and over voltage protected
Operation Conditions.....	-40 - 50 °C (-40 -122 °F), 0-95% RH, non-condensing
Wiring Connections.....	Screw terminal block (14 to 22 AWG)
Enclosure.....	<b>Duct:</b> Grey ABS, UL94-5VB - IP61 (NEMA 2) <b>Outside:</b> Gray ABS, UL94-5VB - IP65 (NEMA 4X)
Enclosure Dimensions.....	<b>Duct:</b> 114 W x 84 H x 53 D mm (4.5" x 3.3" x 2.1") <b>Outside:</b> 145 W x 100 H x 64 D mm (5.7" x 3.95" x 2.5")
Probe.....	<b>Duct:</b> 230 mm (9") long x 12.7 mm (0.5") diameter Stainless steel with porous filter <b>Outside:</b> 20 mm (0.8") long x 28 mm (1.1") diameter PVC hub with mesh filter

### Relative Humidity:

Sensing Element.....	Thermoset polymer based capacitive
Accuracy.....	± 2% RH
Range.....	0 - 100% RH
Resolution.....	0.1% RH
Hysteresis.....	± 1.5% RH
Response Time.....	15 seconds typical
Stability.....	± 1.2% RH typical @ 50% RH in 5 years

### Temperature:

Sensing Element.....	20KΩ NTC thermistor
Accuracy.....	±0.2 °C (±0.4 °F) curve matched
Range.....	-40 - 50 °C (-40 - 122 °F)
Resolution.....	0.1 °C/°F

### BACnet® Communications Interface:

Hardware.....	2-wire RS-485
Software.....	Native BACnet® MS/TP protocol
Baud Rate.....	9600, 19200, 38400 or 76800 - Auto-detect
Network Address Range.....	Locally set to 0-127

### Modbus Communications Interface:

Hardware.....	2-wire RS-485
Software.....	Native Modbus MS/TP protocol (RTU)
Baud Rate.....	4800, 9600, 19200, 38400 or 76800 - Auto-detect
Network Address Range.....	Locally set to 1-255
Parity.....	None
Stop Bits.....	1
CRC.....	A001 (CRC-16 reverse)

## PRODUCT ORDERING INFORMATION:

MODEL	Description
NT	Network Sensor

CODE	Type
DA	Duct
OA	Outside

CODE	Communications Output
BAC	BACnet®
MOD	Modbus

NT	DA	BAC
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## PCB/WIRING INFORMATION (DUCT/OUTSIDE)

### BACnet®

0001342

### Modbus

0001338

Terminal	Function
PWR	24 Vac/dc of controller or power supply
COM	To GND or COMMON of controller
SHLD	To communications bus shield
B +	To + of communications bus
A -	To - of communications bus

## BACnet® COMMUNICATION

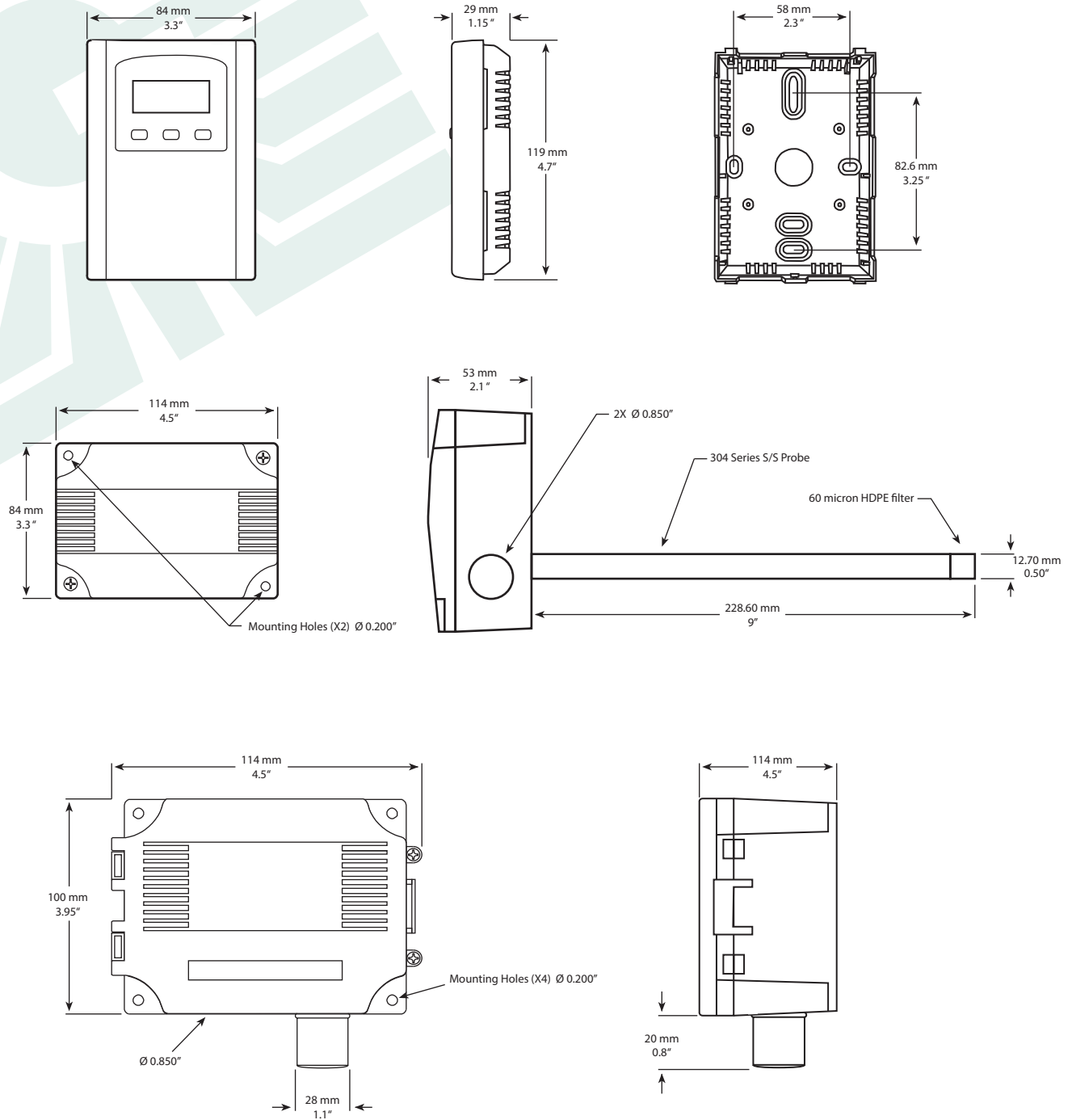
BACnet® is a data communication protocol for building automation and control networks. The sensor communicates on a standard 2-wire RS-485 MS/TP network designed to run at speeds from 9600 to 76800 baud over twisted pair wiring.

BACnet® is a registered trademark of ASHRAE. ASHRAE does not endorse, approve or test products for compliance with ASHRAE standards. Compliance of BACnet® listed products to the requirements of ASHRAE Standard 135 is the responsibility of BACnet® International (BI). BTL is a registered trademark of BI.

## MODBUS COMMUNICATION

Modbus is a network protocol for industrial manufacturing environments. The sensor communicates on a standard Modbus network using the RTU (Remote Terminal Unit) transmission mode. The hardware interface is RS-485.

# DIMENSIONS



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**RoHS**  
COMPLIANT



*Greystone Energy Systems Inc. is one of North America's largest ISO registered manufacturers of HVAC/R sensors and transmitters for Building Automation Management Systems.*

*We have conscientiously established a worldwide reputation as an industry leader by maintaining leading-edge design technology, prompt technical support, and a commitment to on-time deliveries. We take pride in our Quality Management System which is ISO 9001 certified, assuring our customers of consistent product reliability.*

**GREYSTONE HAS AN ISO 9001 REGISTERED QUALITY SYSTEM**