Sontay®
Four Elms Road - Edenbridge
Kent - TN8 6AB - UK

Features and Benefits

- Slim design for room applications
- Easy installation with LED indication
- Supports 2-wire loop powering or 3-wire installation
- Built-in circuitry diagnostics
- Optional set point, momentary button and LCD available

Technical Overview

The RH-S range of humidity and temperature sensors offers the latest technology high precision and accuracy RH & T element.

Humidity accuracy is available as either high accuracy (2%) or standard (3%), there is also an optional direct resistive temperature output. Enthalpy and dewpoint measurement (RH-S-EN) is also available as well as an optional backlit LCD display, set point adjust & momentary switch.

A feature of this sensor is when in 3-wire mode it automatically detects the controller input type, 4-20mA or 0-10Vdc. This can be overridden via a DIP switch if required, also 2-wire loop powering (4-20mA) is also selectable via DIP switch. Sensors have on-board LED indication for power up status, output mode type and useful self-test feature.

Product Codes

RH-S-AH Remote Probe RH & T transmitter ±2%
RH-S Remote Probe RH & T transmitter ±3%
RH-S-EN Remote Probe Enthalpy & Dew point transmitter

Suffixes (replace -T with type)
-T Direct resistive temperature output *
Thermistor types:

A (10K3A1)	B (10K4A1)	C (20K6A1)
H (SAT1)	K (STA1)	L (TAC1)
M (2.2K3A1)	N (3K3A1)	P (30K6A1)
Q (50K6A1)	S (SAT2)	T (SAT3)
W (SIE1)	Y (STA2)	Z (10K NTC)

Platinum types:
D (PT100a) E (PT1000a)
Nickel types:
F (NI1000a) G (NI1000a/TCR (LAN1))

-TR Custom temperature output range (between 0 & 50°C)

Interface Options (add to part code)
-SP Resistive set point 0-10kΩ or 11-1kΩ
-MS Momentary switch
-LCD Integral LCD

-5V Output 0-5Vdc (instead of 0-10Vdc)

Accessories
DECOR Decorators trim plate
GASKET Insulating gasket (pack of 10)

Specification

Outputs:

3-wire	0-10Vdc (0-5V for -5V) or 4-20mA
2-wire	4-20mA, loop powering
(optional -T)	PTC/NTC resistive sensing element
Power Supply:	24Vac/dc ±10% (3-wire)
	24Vdc ±10% (2-wire)
Supply current:	30mA (3-wire) max.
Electrical connections	Pluggable spring loaded terminal block min. 0.2mm^2, max. 1.5mm^2

Output ranges;

RH	0 to 100%	
Temperature	0 to 40°C	
	Others available on request	
Enthalpy	-20 to +250 kj/kg	(-EN only)
Dew point	-50 to +50°C	(-EN only)

Environmental:

Housing:	-10 to 60°C
	0 to 95% non-condensing

Housing:

Material	ABS (flame retardant)
Dimensions	115 x 85 x 30mm
Protection	IP30
Country of origin	UK
Conformity	EMC, CE & UKCA Marked

Note*:
When using the -T option, the thermistor is not compensated for internal self heating.

CE UKCA

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Sensor Characteristics

Humidity

Measurement range	0 to 100% RH	
Type	ASIC	
Accuracy (20 to 80% RH):	Typical	Maximum
RH-S-AH	±2% RH	±3% RH
RH-S	±3% RH	±4% RH
Long term stability	<0.5% RH p.a.	
Response time	8 seconds (t 63%) @ 25°C 1 m/s Airflow	

Temperature

Measurement range	0 to 40°C
Accuracy (20 to 40°C)	±0.5°C
Long term stability	<0.02°C p.a.

Enthalpy

Measurement range	-20 to +250 kj/kg

Dew point

Measurement range	-50 to +50°C
Accuracy	1.2°C typical (4°C max)

Optional Passive Output

Type	Resistive PTC & NTC types
Accuracy:	
Thermistor	±0.2°C 0 to 70°C
Platinum types	±0.2°C @ 25°C
Nickel types	±0.4°C @ 25°C
Set point	Resistive 0-10kΩ or 11-1kΩ ±30% For 1-11kΩ use the 0-10kΩ and add an inline 1kΩ resistor on the controller input side
Momentary switch	VFC 24Vac/dc 50mA max.
Display Option	
LCD	To show T and RH values To show T, RH, DP and H (-EN version)

Installation

Antistatic precautions must be observed when handling these sensors. The PCB contains circuitry that can be damaged by static discharge.

Note: Sontays range of RH sensors are not suitable for use in swimming pool & spa applications. Sensors used in these types of applications are not covered under Sontays warranty terms. Chemicals used in swimming pool & spas can contaminate the humidity element, which results in a reduced service life.

1. Select a location on a wall of the controlled space which will give a representative sample of the prevailing room condition. Avoid sitting the sensor in direct sunlight, on an outside wall or near heat sources. An idea mounting height is 1.5m from the floor.

2. Undo the tamperproof screw at the bottom of the housing and remove the front panel from the base.

3. Using the base as a template mark the hole centres and fix to the wall with suitable screws. Alternatively the base plate can be mounted on to a conduit box or standard recessed back box. The base plate is suitable for EU & North America fixings.

4. Feed cable through the hole in the base plate of the housing, unplug the terminal block from the PCB and terminate the cores at the loose terminal block. Leave some slack inside the unit as required.

5. Set the switch on the PCB either to the 3-wire or 2-wire position. Please refer to "Selecting output mode and LED indication" for more details.

    IMPORTANT Do not alter the switch position while sensor is powered up. Do not select 2-wire if a 0v connection (3-wire) is made. Permanent damage to the sensor or BMS controller may result.

    IMPORTANT Ensure the Terminal Block is fitted the correct position and direction. The cable entry faces the centre of the sensor.

6. Connect all sensor outputs to the controller inputs or to the device, the sensor output(s) are connected to.

7. Before powering the sensor, ensure that the supply voltage is within the specified tolerances.

    IMPORTANT Make all electrical output connections before applying the supply voltage. If the sensor is not connected in this sequence, damage may be caused to the input circuitry of the controller or device the sensor output(s) are connected to.

8. Allow 3 minutes before checking functionality, and at least 30 minutes before carrying out pre-commissioning checks. This will allow the electronics time to stabilise.

To perform an accurate comparison between a transmitter output and a portable reference, it is essential that the two probes are held adjacent for a minimum of 30 minutes in a stable RH environment. Only in this way can speed of response and temperature factors be eliminated. It is not uncommon for test instruments and transmitters to disagree by 10% RH or more when site measurements are taken incorrectly. 'Slings' or other mechanical hygrometer should not be used as a reference

Terminal Block:

For easier installation, the terminal block can be detached from the PCB.

When used with ferrules it doesn't require any tools to release the spring loaded terminal block. When used with stranded cable, push in the orange latch to compress the spring load. Feed in the wire and release the spring to secure the wire connection.

IMPORTANT Make sure the Terminal Block is fitted the correct position and direction. The cable entry faces the centre of the sensor.

Electrical Connections:

24V	Supply 24Vac/dc	**FS1**	Not used
0V	Supply 0V (Common 0V)	**FS2**	Not used
OP1	RH output (Enthalpy for –EN option)	**P5**	Set point
OP2	Temp. output (Dew point for –EN option)	**P6**	Set point, wiper
OP3	Not used	**P7**	Set point
0V	Not used	**MS1**	Momentary switch
TH1	Direct Thermistor output (-T only)	**MS2**	Momentary switch
TH2	Direct Thermistor output (-T only)	**OVR**	Override on LCD
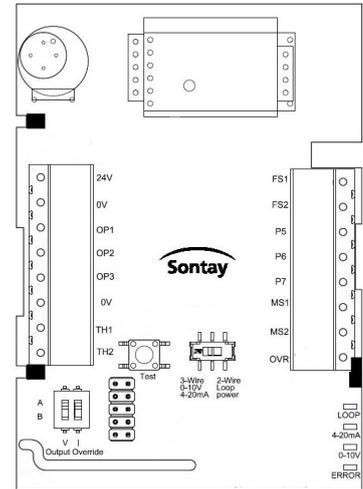
LED Indication:
LOOP	Blue
4-20mA	Yellow
0-10V	Green
ERROR	Red

3-wire, 0-10Vdc / (0-5Vdc optional):

Switch in left hand position

"V" Switch UP

3-wire, 4-20mA:

Switch in left hand position

"I" Switch UP

2-wire, 4-20mA:

"V & I" Switches DOWN

See next page for further information on setting output modes.
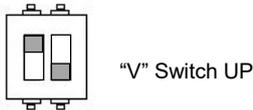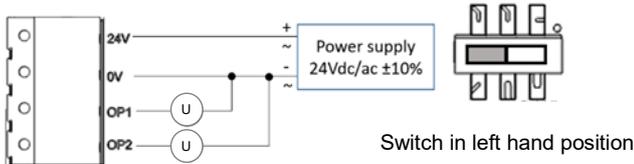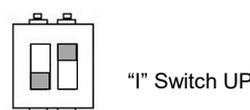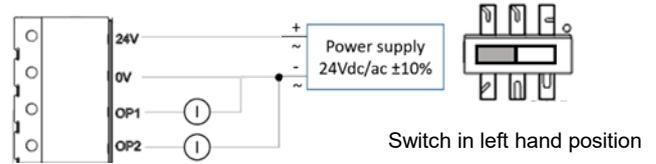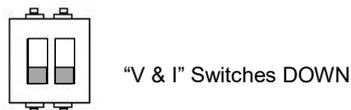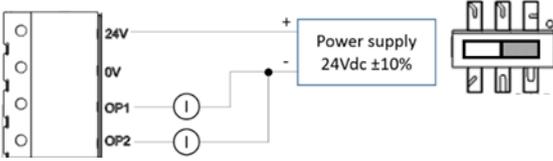
-T, direct resistive output:
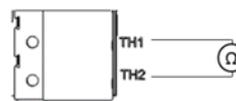
Momentary switch (-MS):
max. 500mA @24Vac/dc

Set point (-SP):

	-	+
P5/P6	0kΩ	10kΩ
P7/P6	11kΩ	1kΩ

For 1-11kΩ use the 0-10kΩ and add an inline 1kΩ resistor on the controller input side

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Selecting output mode and LED indication:

IMPORTANT Do not alter the switch position while sensor is powered up. Do not select 2-wire if a 0v connection (3-wire) is made. Permanent damage to the sensor or BMS controller may result.

3-wire connection:
Ensure there is no power to the sensor before changing the switch. Set the switch in the left hand position. The sensor automatically sets the outputs to 0-10V or 4-20mA based on the resistive load on the outputs. All outputs MUST be connected to the same type of load:

- If ALL the loads are >2k2Ω, all the outputs will be set to 0-10Vdc and the green 0-10V LED will light.

- If ALL the loads are >50Ω and <550Ω, all the outputs will be set to 4-20mA and the yellow 4-20mA LED will light.

- If ANY of the loads are <50Ω or >550 and < 2k2Ω, all the outputs will be switched off and the red ERROR LED will light.

Auto detection can be overridden via 2-way DP switch situated on the left hand side of the PCB.

Set the auto detection 2-way DIP switch to the **3-wire** position
Set the override 2-way switch to:
- Voltage (0-10V/0-5V)   switch DIP1 (V) to ON
- Current (4-20mA)   switch DIP2 (I) to ON

The ON position for the switch is labelled on the switch itself.

Example, if you set the V switch (left) to OFF and the I switch (right) to ON, the device will force 3-wire current mode. The device is also set up to detect a change on these switches and reboot itself after 5 seconds - the error LED will flash during this period then the yellow 4-20mA LED will illuminate.

2-wire connection:
Ensure there is no power to the sensor before changing the switch and do not connect 0V. Set the switch in the right hand position. All outputs MUST be connected. The blue LOOP LED will light.

The LEDs will switch off after 15 minutes.

Self-Test Button:

The self-test button helps the installer to validate the wiring for each output and helps to commission the system.
When self-test button is pushed it cycles all outputs as follows: 0%, 50%, 100%, normal operation. After 30 seconds in any mode the system resets to normal operation.

When self-test button is held for more than 3 seconds, it sets all outputs to 50%, when released the outputs return to normal operation.

Dimensions:
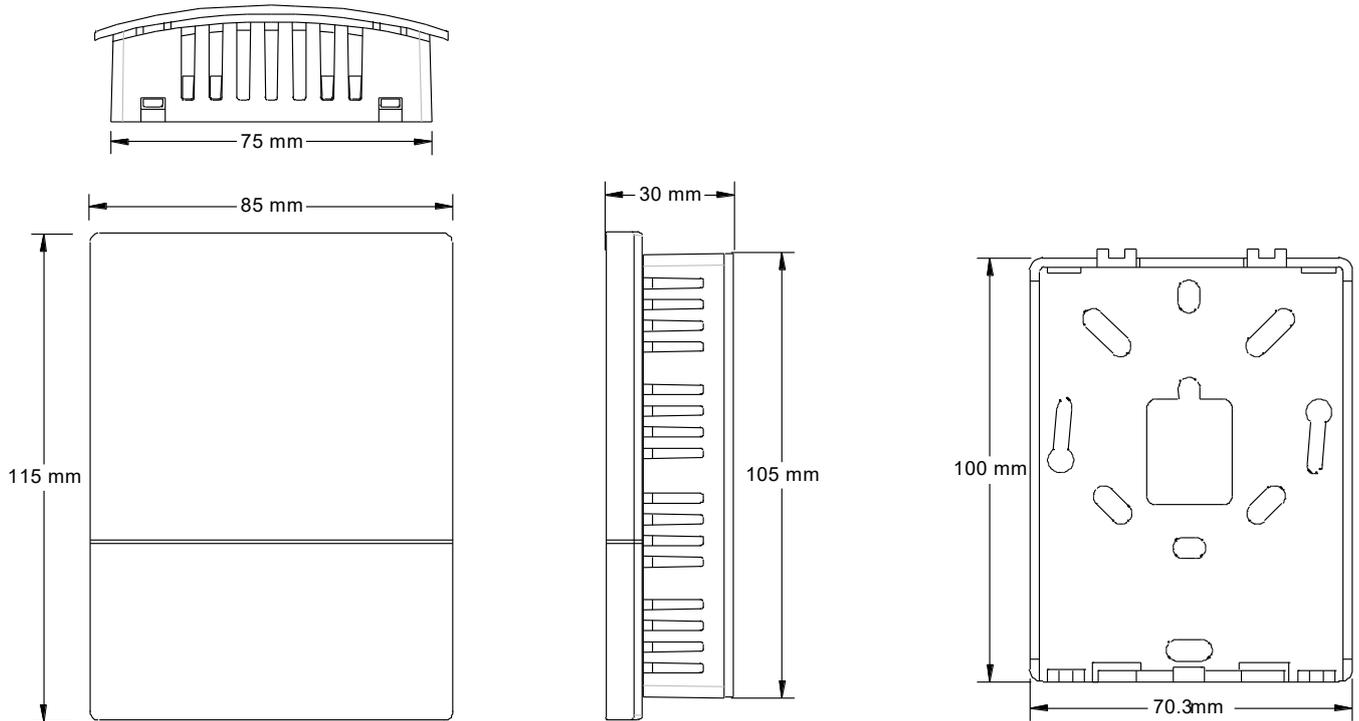
Revision History:

Rev.	Description of change	Page No.	Date
7.4	Output type override & dimensions	3, 4 & 5	23/06/2022
7.3	UKCA added	1	30/09/2021
7.2	Change over of outputs, OP1 & OP2	3	14/04/2020
7.1	LED status	4	31/01/2020
7.0	New product	All	24/09/2019

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