Sontay®
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# RH-R
# Remote Probe RH & T Sensors

Issue Number 10.0
22/08/2025



## Features and Benefits

- Robust sensor enclosure
- Easy installation with LED indication
- Supports 2-wire loop powering or 3-wire installation
- Built-in circuitry diagnostics

## Technical Overview

The RH-R series of precision humidity and temperature sensors are designed for accuracy and reliability. Choose from high (±2%) or standard (±3%) humidity accuracy, with optional resistive temperature output. Also available are enthalpy and dew point measurements, plus optional backlit LCD.

RH-D sensors can automatically select 4-20mA or 0-10Vdc outputs based on the controller input impedance in 3-wire mode, with easy DIP switch overrides and selectable 2-wire loop powering. Onboard LED indicators provide power status, output mode, and a handy self-test feature.

## Product Codes

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

Suffixes

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))

| | |
|---|---|
| **-LCD** | Integral LCD |
| **-TR** | Custom temperature output range (between -20 & +50°C) |
| **-5V** | Output 0-5Vdc (instead of 0-10Vdc) |

## Specification

| | | |
|---|---|---|
| Outputs: | | |
| 3-wire | 0-10Vdc (0-5V for -5V) or 4-20mA | |
| 2-wire | 4-20mA, loop powering | |
| (optional) | PTC/NTC resistive sensing element | |
| Power Supply: | 24Vac/dc ±10% (3-wire)<br>24Vdc ±10% (2-wire) | |
| Supply current: | 30mA (3-wire) max. | |
| Auto detection | 4 minutes | |
| Electrical connections | Pluggable spring loaded terminal block min. 0.2mm², max. 1.5mm² | |
| Output ranges; | | |
| RH | 0 to 100% | |
| Temperature | -20 to +50°C | |
| Enthalpy | -20 to +250 kj/kg | (-EN only) |
| Dew point | -50 to +50°C | (-EN only) |
| Environmental: | | |
| Housing: | -30 to 60°C<br>0 to 95% non-condensing | |
| Media: | -10 to +50°C | |
| Housing: | | |
| Material | PC (Halogen free, flame retardant & UV stabilized) | |
| Dimensions | 123 x 103 x 54mm | |
| Probe: | | |
| Material | Probe PVC - End cap Delrin | |
| Dimensions | 90 x 20mm dia. | |
| Flying lead | 2 meters | |
| Protection | IP65 | |
| Conformity | EMC, CE & UKCA Marked | |

**WEEE Directive:**

At the end of the products useful life please dispose as per the local regulations.
Do not dispose of with normal household waste.
Do not burn.

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## Sensor Characteristics

**Humidity**

| | | |
|---|---|---|
| Measurement range | 0 to 100% RH | |
| Type | ASIC | |
| Accuracy (20 to 80% RH): | Typical | Maximum |
| RH-R-AH | ±2% RH | ±3% RH |
| RH-R | ±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 | -20 to +50°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 |
| Accuracy | 1.8 kj/kg typical (27 kj/kg max) |

**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 |

| | |
|---|---|
| **LCD** | Temp. & RH<br>Temp., RH, DP and EN (-EN) |

## Installation

**Handling & Precautions:**

- Use **antistatic precautions** – static discharge can damage the PCB.
- **Do not use** in swimming pools or spas (chemicals shorten sensor life and void warranty).
- Install **after construction/renovation** to avoid dust (warranty may be void if contaminated).

**Installation Steps:**

1) Fix housing to wall with appropriate screws.

2) Open lid by pressing the tab, feed cable through gland and terminate wires (see “Electrical Connections”). Tighten gland for water-tight seal.

3) For outdoor use, mount with cable entry at bottom. If fed from above, add a rain loop before entry.

4) Set PCB switch to 2-wire or 3-wire. Use A/B dipswitches to override auto detection (see “Selecting Output Mode”).
**Do not** change while powered – may damage sensor or controller.

5) Connect outputs to controller and check supply voltage before powering.

6) Wait 4 minutes for initial check, 30 minutes before pre-commissioning

**Calibration & Testing:**
For accurate comparison with a reference, probes must be adjacent in a stable RH environment for at least 30 min. Avoid using mechanical hygrometers or “slings.”

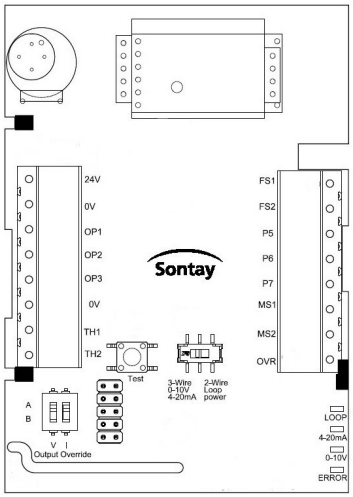
## Terminal Block

Detachable for easy installation. For ferrules, no tools needed. For stranded wires, press the orange latch, insert the wire, and release.
**Ensure the cable entry faces the sensor centre.**


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## Electrical Connections

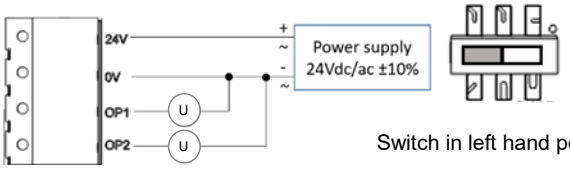
**24V** Supply 24Vac/dc
**0V** Supply 0V (Common 0V)
**OP1** RH output (Enthalpy for –EN option)
**OP2** Temp. output (Dew point for –EN option)
**OP3** Not used
**0V** Not used
**TH1** Direct Thermistor output (-T only)
**TH2** Direct Thermistor output (-T only)



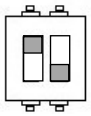

**LED Indication:**

| | |
|---|---|
| LOOP | Blue |
| 4-20mA | Yellow |
| 0-10V | Green |
| ERROR | Red |

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

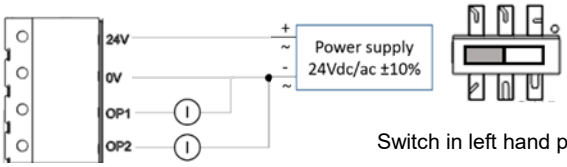



Switch in left hand position

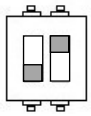


"V" (left) Switch UP

**3-wire, 4-20mA**:

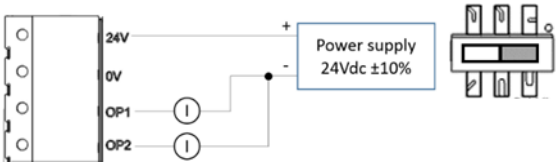


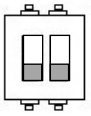

Switch in left hand position



"I" (right) Switch UP

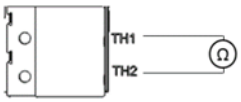
**2-wire, 4-20mA**:



"V & I" Switches DOWN

**-T, direct resistive output**:





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## Selecting Output Mode & LED Indication

**Note**: Power off before changing dip switches. Do **not** select 2-wire if 0V (3-wire) is connected, permanent damage may result.

**3-Wire (Left Switch):**
Auto-detect:

- Loads >2.2kΩ → 0-10Vdc (Green LED)
- Loads >50 & <550Ω → 4-20mA (Yellow LED)
- Loads <50Ω or >550Ω & <2.2kΩ → Outputs off (Red error LED)

Override DIP Switch:

- DIP1 ON → Voltage
- DIP2 ON → Current

If Sensor powered, reboots 5 seconds on change; error LED flashes.

**2-Wire (Right Switch):**

- Do **not** connect 0V
- **All** outputs must be connected
- Blue LOOP LED on

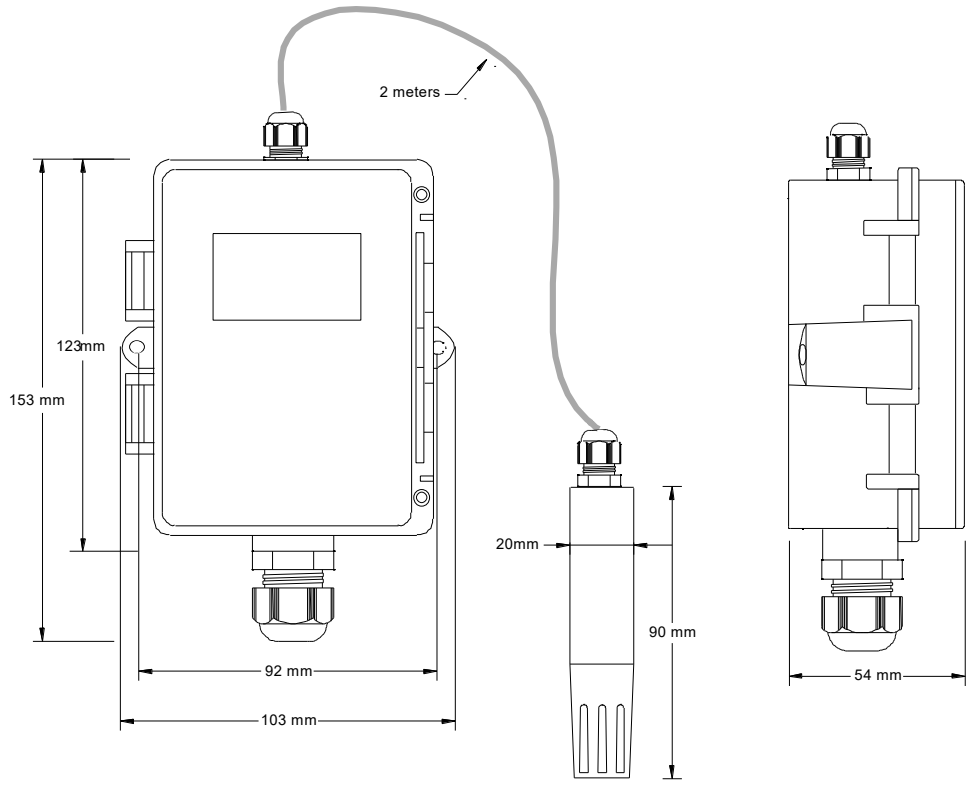
LEDs turn off after 15 minutes.

## Self-Test Button

The self-test button allows the installer to verify wiring and commission the system. Pressing it cycles all outputs through 0%, 50%, 100%, then back to normal operation after 30 seconds.

Holding the button for over 3 seconds sets all outputs to 50%; releasing it returns them to normal operation.

## Dimensions




Whilst every effort has been made to ensure the accuracy of this specification, Sontay cannot accept responsibility for damage, injury, loss or expense resulting from errors or omissions. In the interest of technical improvement, this specification may be altered without notice.

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