SRC-H1T1 Indoor humidity & temperature transmitter

Features

- Indoor humidity and temperature measurement
- Replaceable sensor element
- Sensor reconditioning function against contamination
- Anti-Creep function for high humidity environments
- Minimum and maximum value memory
- 0…10 V, 0…20 mA or 2…10 V, 4…20 mA measuring signals selectable with jumpers
- Optional alternative signal ranges programmable
- Selectable averaging signal
- Optional external display (OPA-S)
- Status LED

Applications

- Indoor, Indoor humidity measurement for heating, ventilation and air conditioning applications
- Recording of minimum and maximum values for critical environments
- Supervision of critical humidity
- Measurements in high humidity environments

Humidity transmitter

A capacitive sensor element is used for measuring relative humidity. The applied measuring technology guarantees excellent reliability and long-term stability. The microprocessor samples the humidity once per second. It calculates an averaging signal over a preset number of seconds and generates the output signal.
Standard output signal range and types may be selected by jumpers. Standard signal ranges are: 0…10 VDC, 2…10 VDC, 0…20 mA and 4…20 mA. Other ranges can be defined by using a programming tool (OPA-S).

Minimum and maximum values

Using a display & programming accessory, the user has the option to read out and reset minimum and maximum values. The minimum and maximum values may as well be used as output signals. The minimum and maximum values are saved into the EEPROM and are available after a power interruption.

Safety

⚠ **DANGER! Safety advice**
This device is for use as a humidity transmitter. It is not a safety device. Where a device failure could endanger human life and property, it is the responsibility of the client, installer and system designer to add additional safety devices to prevent such a device failure. Ignoring specifications and local regulations may cause equipment damage and endangers life and property. Tampering with the device and misapplication will void warranty.

Types and Ordering

Per default a sensor element with 3% RH accuracy is included. Contact your local sales contact to order sensing elements with different accuracies.

Transmitter

Product Name	Product No.	Description/Option
SRC-H1T1-A3	40-300142	Humidity transmitter with temperature sensor
Pre-Configured Versions		
SRC-H1T1-A3-W0	40-300142-0	**Signal range: -40…60°C (-40…140°F) (Default)**
SRC-H1T1-A3-W1	40-300142-1	Signal range: -35…35°C (-31…95°F)
SRC-H1T1-A3-W2	40-300142-2	Signal range: 0…50°C (32…122°F)
SRC-H1T1-A3-W3	40-300142-3	Signal range: Special – Specify in order

Sensor element

Product Name	Product No.	Humidity Accuracy [%rH]	Temperature Accuracy [K] @25°C (77°F)	Description/Option
AES4-HT-A2	40-500153	2%	± 0.5°	Humidity temperature sensor element
AES4-HT-A3 *	40-500152	3%	± 0.4°	
AES4-HT-A5	40-500144	5%	± 0.3°	

* Standard sensor

Accessories

Product Name	Product No.	Description/Option
OPA-S	40-500006	External display module

Technical Specifications

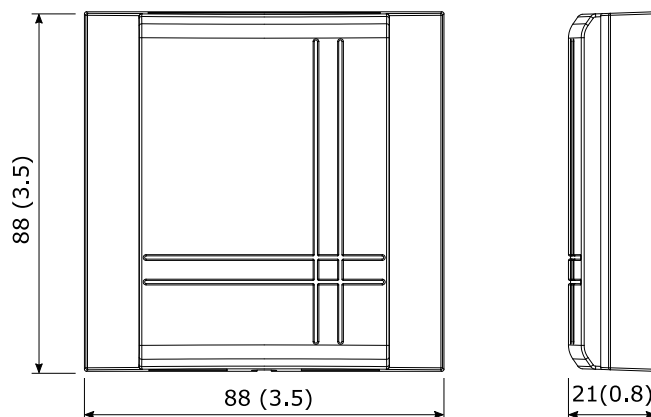|		
Power supply	Operating Voltage Transformer	24 VAC 50/60 Hz ± 10%, 24VDC ± 10% SELV to HD 384, Class II, 48VA max
	Power Consumption	Max 2 VA
	Terminal Connectors	For wire 0.34…2.5 mm² (AWG 24…12)
Sensing probe	Humidity Sensor: Range Measuring Accuracy Hysteresis Repeatability Stability	Capacity sensor element 0…100 % rH See Figure 1 ± 1% ± 0.1% < 0.5% / year
	Temperature Sensor: Measuring Accuracy Repeatability	Bandgap sensor See Figure 2 ± 0.1°C, ± 0.2°F
Signal outputs	Analog Outputs Output Signal Resolution Maximum Load	 DC 0-10V or 0…20mA 10 Bit, 9.7 mV, 0.019.5 mA Voltage: ≥1kΩ Current: ≤250Ω
Environment	Operation Climatic Conditions Temperature Humidity	To IEC 721-3-3 class 3 K5 0…70°C (32…158°F) <95% R.H. non-condensing
	Transport & Storage Climatic Conditions Temperature Humidity Mechanical Conditions	To IEC 721-3-2 and IEC 721-3-1 class 3 K3 and class 1 K3 0…70°C (32…158°F) <95% R.H. non-condensing class 2M2
Standards	Degree of Protection	IP30 to EN 60 529
	Safety Class	III (EN 60730-1)
General	Housing Materials Cover Mounting Plate	Flame retardant PC+ABS plastic (UL94 class V-0) Galvanized steel
	Dimensions (H x W x D)	21 x 88 x 88 mm (0.8 x 3.5 x 3.5 in)
	Weight (including package)	160 g (5.6 oz)

Product testing and certification

CE   Declaration of Conformity   Information on the conformity of our products can be found on our website www.vectorcontrols.com on the corresponding product page under "Downloads".

Dimension mm(inch)

Mounting and Installation

Mounting location

- On a flat, easily accessible inner wall
- The following installation locations should be avoided:
  - Protect from direct exposure to sunlight
  - Do not install near heat sources, e.g. radiators or other heat-generating devices
  - Air storage spaces and niches, e.g. behind doors or shelves
  - Outside walls insufficiently insulated
  - In the direct sphere of influence of ventilation openings and fans

> **!** **Important**
> Observe local regulations!

Sealing of cable entries
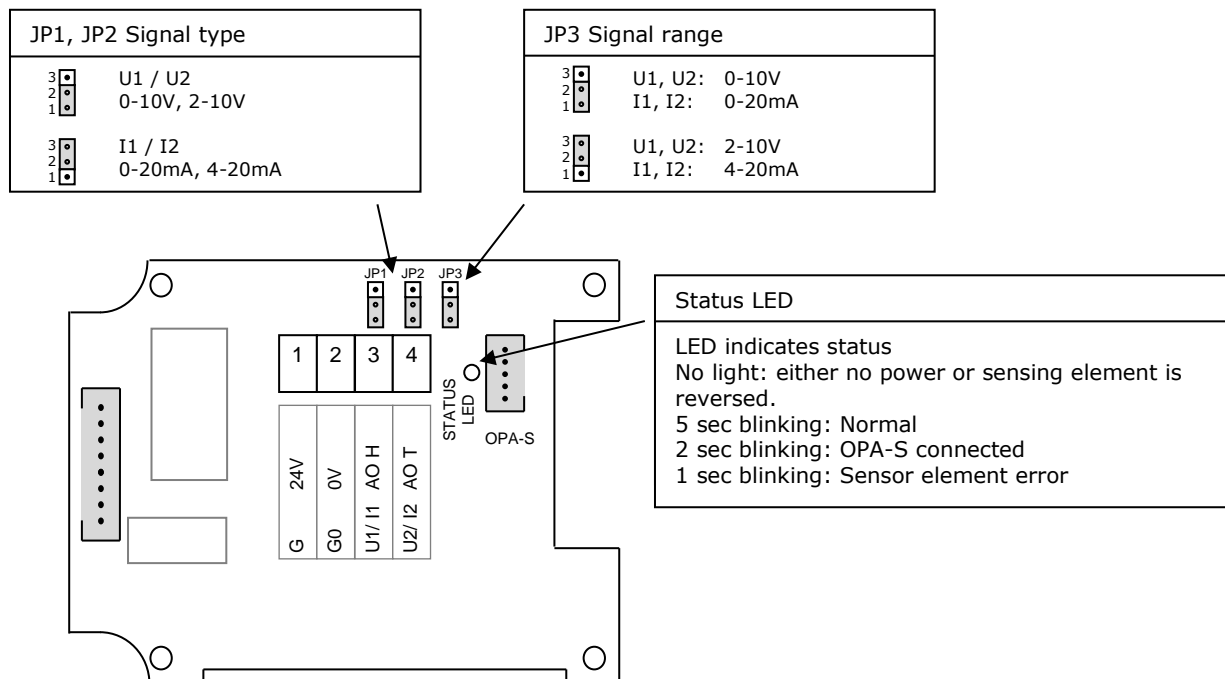
> **!** **Important**
> All cable entries into the connection box must be sealed to prevent air drafts, which could otherwise affect the sensors in the device and prevent correct measurements!

Mounting instruction / replacing the sensor element

See installation sheet no. 70-000568 (www.vectorcontrols.com).

Jumper settings

JP1, JP2 Signal type	
3 2 1	U1 / U2 0-10V, 2-10V
3 2 1	I1 / I2 0-20mA, 4-20mA

JP3 Signal range	
3 2 1	U1, U2: 0-10V I1, I2: 0-20mA
3 2 1	U1, U2: 2-10V I1, I2: 4-20mA

Status LED

LED indicates status
No light: either no power or sensing element is reversed.
5 sec blinking: Normal
2 sec blinking: OPA-S connected
1 sec blinking: Sensor element error

Recondition the sensing element

> **!** **Important**
> If the sensor has been exposed to chemical contamination or prolonged exposure to very humid climates (> 80%), we recommend running the "Sensor Reconditioning Function" once prior to continuous use to remove contamination and creep effect. This will ensure that the sensor operates at its specified accuracy.

For details on how to activate the sensor reconditioning function see chapter "Sensor reconditioning function" on page 4.

Information about storage, packaging and usage environment

ⓘ NOTE:
The sensing part is a polymer, which measures the humidity in the ambient air. For proper sensor operation some mandatory precautions need to be taken during storage, packaging and usage.
The transmitter and its sensing element should not be packaged, stored or used in out-gassing plastic materials, which could cause sensor contamination. In particular, it is recommended not to use any glue or adhesive tapes (Sellotape, Scotch-Tape, Tesa-Film, etc.) within the package or close proximity of the sensor. Foamed materials often cause contamination problems and should not be used to package the transmitter. Best packaging material is a simple cardboard box or a deep-drawn plastic case in a cardboard box.

Sensor

Accuracy of Temperature & Humidity sensor in -H, -T and -HT type
AES4-HT-A3 standard sensor
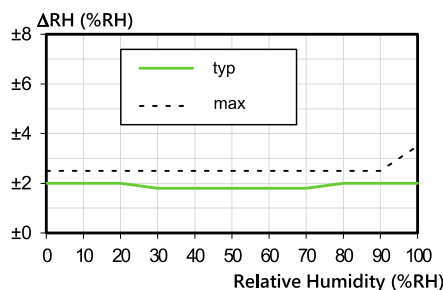
Relative humidity absolute accuracy

Figure 1: Typical and maximal RH accuracy at 25°C (77°F)
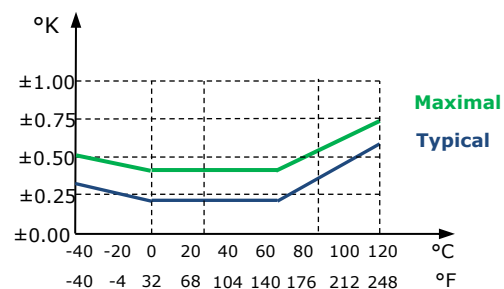
Temperature accuracy

Figure 2: Typical and maximal temperature accuracy

Anti-creep function for devices with AES4 sensors
Ensuring high accuracy of humidity measurement
When the AES4 sensor is exposed to very humid environments for extended periods of time, an anti-creep function is activated in the background to ensure that the sensing element remains accurate. While the anti-creep function is active, the RH value will appear to be frozen for short periods of time.

Sensor reconditioning function

Reconditioning the humidity sensing element eliminates chemical contamination and creep effects on the sensor and ensures that it operates at its specified accuracy.
Reconditioning can be configured to run once, periodically, or only at power-up.

Parameter **IP08** allows for sensor reconditioning of AES4 sensors.
Per default the value of this parameter is 0. If a number is entered the reconditioning procedure is started:
- The sensor is reconditioned for the number of minutes entered in **IP08**. During this time the status LED blinks in 1 second rhythm.
- If no interval is defined with **IP09**, the number in **IP08** is set to 0, once the recondition has started.
- If an interval is set with **IP09**, the value remains unchanged. When the internal counter reaches 0, reconditioning stops. The interval in hours defined in **IP09** determines the waiting time for the next reconditioning. The interval is stopped during a power failure and resumed when power is restored.

Parameter **IP10** allows reconditioning at each power-up. This reconditioning interval is independent of **IP08** or **IP09** settings. At each power up, the sensor will perform the reconditioning function according to the time in minutes defined with **IP10**.

ⓘ **Recommendation**
We recommend to set the **IP08** value to **80** minutes recondition time if the sensor is out of its accuracy range.

ⓘ **Note**
The display will freeze during reconditioning.

❗ **Important**
Reconditioning will not continue if interrupted by a power cycle!

Configuration

The transmitter can be adapted to fit perfectly into any application by adjusting the software parameters. The parameters are set with the operation terminals OPA-S. The OPA-S may also be used as remote indicator.

Input configuration

Parameter	Description	Range	Default
IP 00	TI1: Celsius or Fahrenheit, C = OFF, F = ON	ON, OFF	OFF
IP 01	TI1: Samples taken for averaging control signal	1…255	10
IP 02	TI1: Calibration	-10…10	0
IP 03	TI1: Minimum temperature	-40…215 °C/F	0 °C
IP 04	TI1: Maximum temperature	-40…215 °C/F	50°C
IP 05	H1: Show Percent	ON, OFF	ON
IP 06	H1: Samples taken for averaging control signal	1…255	10
IP 07	H1: Calibration	-10…10%	0
IP 08	Duration of the AES4-HT sensor reconditioning. This value will be cleared if periodic reconditioning is not active. It will remain if periodic reconditioning is enabled. 0: Not active	0-240 min	0 (not active)
IP 09	Interval period for AES4-HT sensor reconditioning 0: Periodic reconditioning disabled 1-240: Period reconditioning enabled (repeats every xxx hours)	0-240 hours	0 (not active)
IP 10	Power up reconditioning for AES4-HT sensor. The sensor is reconditioned each time it is power up. Periodic reconditioning settings have no effect. 0: Not active.	0-240 min	0 (not active)

Output configuration

Parameter	Description	Range	Default
OP 00	AO1: Humidity: Configuration of output signal: 0 = Feedback humidity input, 1 = Feedback humidity minimum value 2 = Feedback humidity maximum value	0 – 2	0
OP 01	AO1: Humidity: Minimum limitation of output signal	0 – Max %	0%
OP 02	AO1: Humidity: Maximum limitation of output signal	Min – 100%	100%
OP 03	AO2: Temperature: Configuration of output signal: 0 = Feedback temperature input, 1 = Feedback temperature minimum value 2 = Feedback temperature maximum value	0 – 2	0
OP 04	AO2: Temperature: Minimum limitation of output signal	0 – Max %	0%
OP 05	AO2: Temperature: Maximum limitation of output signal	Min – 100%	100%

Output signal configuration

The analog output signal type may be configured with a jumper for 0-10 VDC or 0-20 mA control signals. The jumpers are located next to the terminal connector of each analog output. See table below for jumper placement. The factory setting is to 0-10 VDC.

Signal type	JP1, JP2
0 – 10 V	(1-2)
0 – 20 mA	(2-3)

The signal range may be set with JP3 for both analog outputs. JP3 will only operate if the output range specified with OP01 and OP02 is left at the default position of 0…100%. With any other setting the position of JP3 has no influence and the range defined with the output parameters applies.

Signal range	JP3
0 – 10 V, 0 – 20 mA	(1-2)
2 – 10 V, 4 – 20 mA	(2-3)

Jumper settings

For jumper settings see chapter "Jumper settings" on page 3.

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