

SOC-H1T

Outdoor Humidity Transmitter & Temperature Sensor

Features

- Replaceable sensor element
- Outdoor humidity and temperature measurement
- Minimum and maximum value memory
- 0...10V, 0...20mA or 2...10V, 4...20mA measuring signals selectable with jumpers
- Optional alternative signal ranges programmable
- Selectable averaging signal
- Optional LCD display (OPC-S) or external display (OPA-S)
- Status LED

Applications

- Outdoor humidity & temperature measurement for heating, ventilation and air conditioning applications.
- Recording of minimum and maximum values for critical environments
- Supervision of critical humidity and temperatures

Humidity & Temperature Transmitter

A unique 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.

The output signal range and type may be customized by jumpers and if required by a programming tool. Standard signal ranges are 0-10VDC, 2-10VDC, 4-20mA and 0-20mA. These ranges can be set by jumpers. Other ranges can be set by using a programming tool. (OPA-S or OPC-S)

A version with display is possible by ordering the integrated display accessory OPC-S.

Minimum and Maximum Values:

Using the programming tool, 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.

Temperature Sensor

The sensor measures the temperature by use of a NTC, PT, or NI-sensing element. The sensing element is either a glass packed thermistor with a negative temperature coefficient, a platinum film or a nickel thin layer based probe. Its resistance changes according to the temperature. The change follows a specified curve. Contact our sales department for curves not yet listed below.

Ordering

In order to receive an operational unit, the signal converter, the sensor element and the conduit connector or cable gland need to be ordered. Optionally a display module and a weather shield may be added.

Signal converter

Item Name	Item Code	Description/Option
SOC-H1T	40-30 0071	Signal converter for humidity sensor with temperature probe

Sensor element

Item Name	Item Code			Description/Option
AES-HTn3	40-50 0032	NTC 3kΩ at 25°C (77°C)	B _{25/50} 3935	
AES-HTn10	40-50 0033	NTC 10kΩ at 25°C (77°C)	B _{25/50} 3935	
AES-HTn11	40-50 0034	NTC 10kΩ at 25°C (77°C)	B _{25/50} 3630	
AES-HTn12	40-50 0043	NTC 10kΩ at 25°C (77°F)	B _{25/50} 3380	
AES-HTn20	40-50 0035	NTC 20kΩ at 25°C (77°C)	B _{25/50} 4200	
AES-HTn100	40-50 0036	NTC 100kΩ at 25°C (77°C)	B _{25/50} 4200	
AES-HTp1	40-50 0037	PT100	EN60751	
AES-HTp2	40-50 0038	PT1000	EN60751	
AES-HTk5	40-50 0039	NI1000	5000 ppm/K	
AES-HTxx-A2	40-50 00xx-2	2%		Accuracy Option of Humidity - sensor element
AES-HTxx-A3	40-50 00xx-3	3%		
AES-HTxx-A5	40-50 00xx-5	4.5%		



Accessories

Item Name	Item Code	Description/Option
OPC-S	40-50 0029	Built in display & programming module
OPA-S	40-50 0006	External display module
AMS-1	20-10 0116	Weather shield to protect the sensor element
AMC-1	20-10 0035	Cable gland PG9 for cables 4 – 8 mm (AWG 6 – 1)
AMC-2	20-10 0067	Conduit connector NPT 1/2

Technical Specification

Power Supply	Operating Voltage	24 V AC 50/60 Hz 10%, 24VDC 10%
	Transformer	SELV to HD 384, Class II, 48VA max
	Power Consumption	Max 2 VA
Sensing Probe	Terminal Connectors	For wire 0.34...2.5 mm ² (AWG 24...12)
	Humidity Sensor:	Capacity sensor element
	Range	0...100 % rH
	Measuring Accuracy	See Figure 1
	Hysteresis	1%
	Repeatability	0.1%
	Stability	< 0.5% / year
	Thermistor:	
	Accuracy:	-40...0°C (-40...32°F): 0.5 K 0...50°C (32...122°F): 0.2 K 50...70°C (122...158°F): 0.5 K
	Platinum-Film:	PT according EN 60751
Signal Outputs	Range: (Probe only)	-40...70°C (-94...158°F)
	Accuracy	EN 60751, Class B
	Nickel Thin Layer:	1000 Ω at 0°C, 5000 ppm/K
	Range: (Probe only)	-40...70°C (-76...158°F)
Environment	Accuracy	DIN 43760
	Analog Outputs	DC 0-10V or 0...20mA
	Output Signal	10 Bit, 9.7 mV, 0.019.5 mA
	Resolution	Voltage: ≥1kΩ Current: ≤500Ω
Standards	Maximum Load	
	Operation	To IEC 721-3-3
	Climatic Conditions	class 3 K5
	Temperature	-40...70°C (-40...158°F)
Standards	Humidity	<95% R.H. non-condensing
	Transport & Storage	To IEC 721-3-2 and IEC 721-3-1
	Climatic Conditions	class 3 K3 and class 1 K3
	Temperature	-40...80°C (-40...176°F)
Standards	Humidity	<95% R.H. non-condensing
	Mechanical Conditions	class 2M2
Standards	CE conformity	2004/108/EC
	EMC Directive	2006/95/EC
	Low Voltage Directive	
	Product standards Automatic electrical controls for household and similar use	EN 60 730 -1
Standards	Special requirement on temperature dependent controls	EN 60 730 - 2 - 9
	Electromagnetic compatibility for domestic and industrial sector	Emissions: EN 60 730-1 Immunity: EN 60 730-1
	Degree of Protection to EN 60529	IP63 if correctly mounted with AMS-1
	Safety Class	III (IEC 60536)
General	Housing materials	PC+ABS (UL94 class V-0)
	Cover, back part	PTFE coated 1µm pores
	Filter material	
	Dimensions (H x W x D):	150 x 91 x 47mm (5.9" x 3.7" x 1.9")
General	Weight (including package)	220g (7.8 oz)

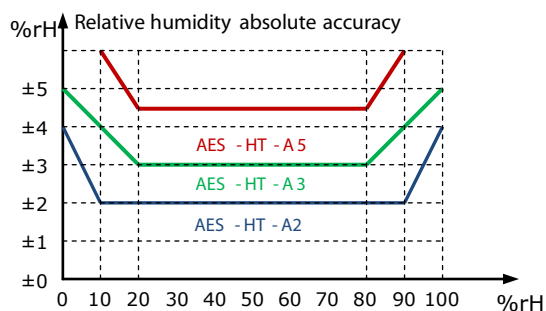
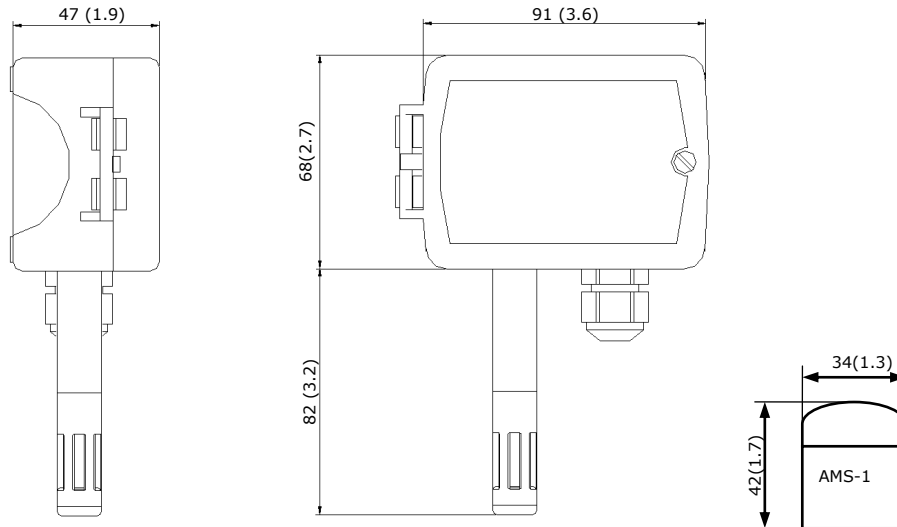


Figure 1: Max RH-tolerance at 25°C (77°F) per sensor type

Dimensions mm (inch)



Mechanical design and installation

The unit consists of two parts: (a) The back part with the probe and (b) the cover.

Mounting location

The transmitter should be installed, probe facing down, directly on the wall, in a weather protected area. The weather shield accessory is recommended, in case the transmitter is exposed to weather and direct sunlight.

Warning about storage, packaging and usage environment

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.

Installation

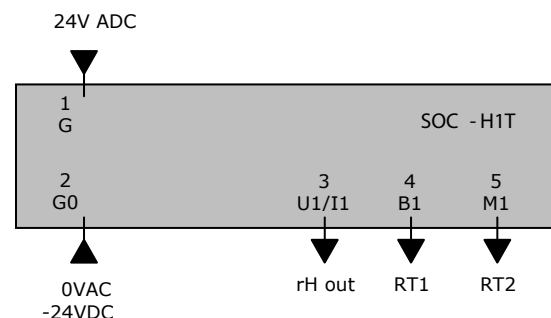
1. Turn the single screw on the cover counterclockwise and remove cover.
2. Mark the location for the mounting holes on the wall.
3. Depending on the wall material, drill two holes for plugs or use self tapping screws.
4. Mount the transmitter flat on a wall in a weather protected area. The probe must face downwards. A weather shield should be added to protect the sensor element from direct water and sun light.
5. Connect the conductors to the terminals according to wiring diagram.
6. While in the open position, slide the two hooks of the cover into the latch at the left side of the back part.
7. Close the front part.
8. Tighten the single screw on the cover clockwise to secure the cover to the back part. There is no need to tighten the screw too much.

Installation of the weather shield AMS - 1:

1. Unscrew filter cap by turning it counter clockwise
2. Make sure O-ring fits nicely inside small opening of AMS-1 and thread of sensor probe is clean
3. Place AMS-1 over sensor probe with small opening facing upwards
4. Replace filter cap and carefully fix AMS-1 by screwing filter cap on clockwise

Connection terminals

- | | |
|-------|--|
| 1: G | Power supply 24VAC, +24VDC |
| 2: G0 | Power supply 0VAC, -24VDC |
| 3: U1 | JP1 = 1-2, voltage output of humidity transmitter 0...10V or 2...10V (JP3) |
| 3: I1 | JP1 = 2-3, current output of humidity transmitter 0...20mA or 4...20mA (JP3) |
| 4: B1 | Passive temperature sensor probe signal |
| 5: M1 | Passive temperature sensor probe signal |



Output signal configuration

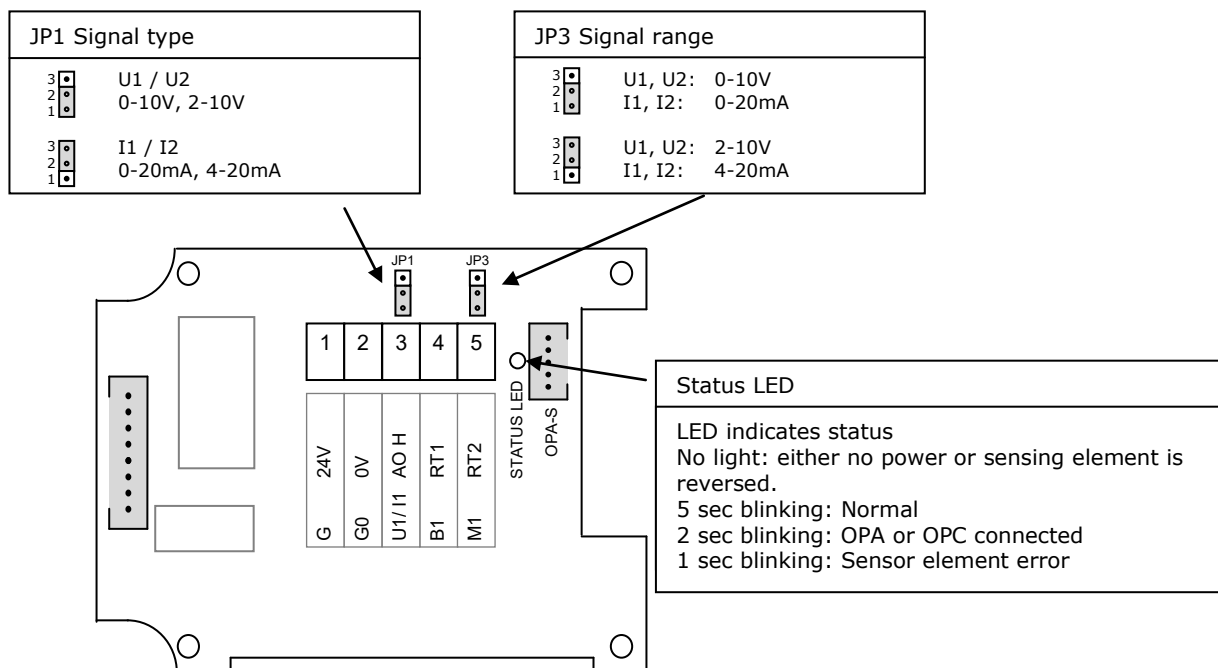
The analog output signal type may be configured with a jumper for 0-10 VDC or 0-20 mA control signals. The jumpers are located next to the terminal connector of each analog output. See table below for jumper placement. The factory setting is to 0-10 VDC.

Signal Type	JP1
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



Configuration parameters

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 or OPC-S. The OPA-S may also be used as remote indicator.

Input configuration

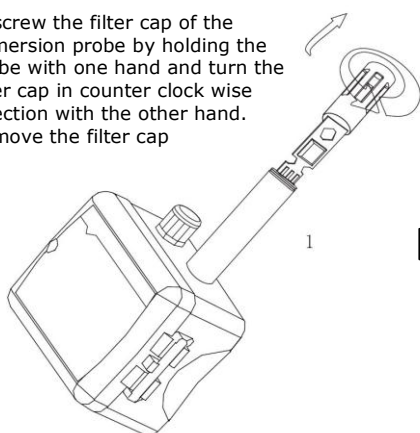
Parameter	Description	Range	Default
IP 00	H1: Show Percent	ON, OFF	ON
IP 01	H1: Samples taken for averaging control signal	1...255	10
IP 02	H1: Calibration	-10...10%	0

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%

Replacing the sensing element

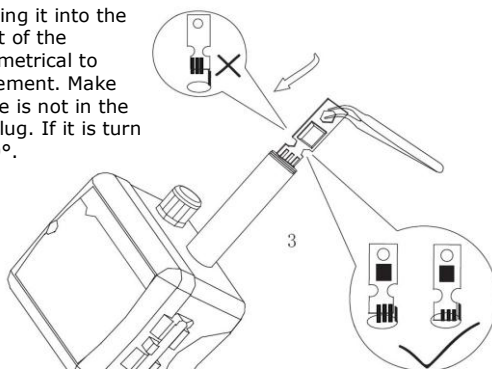
Unscrew the filter cap of the immersion probe by holding the probe with one hand and turn the filter cap in counter clock wise direction with the other hand. Remove the filter cap



Remove the sensor by pulling it out of the plug with the help of a pair of tweezers. Try not to touch the sensor element by hand.



Observe orientation of the new sensor before plugging it into the connector. The front of the connector is unsymmetrical to prevent wrong placement. Make sure the black nipple is not in the way of the sensor plug. If it is turn the sensor plug 180°.



Push the new sensor into the plug until a click is felt and there is no air between connector and sensor

Replace the filter cap by placing it over the sensor and turning it in clockwise direction. Use reasonable torque to screw on the filter cap.

