

SDC - H1T Duct Humidity Transmitter & Temperature Sensor

Features

- Replaceable sensor element
- Humidity and temperature measurement for air ducts
- 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

- Humidity & temperature measurement for supply and return air ducts in heating, ventilation and air conditioning applications.
- Recording of minimum and maximum values for critical environments
- Supervision of critical humidity and temperatures



Humidity 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 may be added.

Signal converter

Item Name	Item Code	Description/Option
SDC-H1T-08	40-30 0068	Signal converter for duct mounting: probe length 77mm (3")
SDC-H1T-16	40-30 0069	Signal converter for duct mounting: probe length 157mm (6.2")


Sensor element

Item Name	Item Code			Description/Option
AES-HTn3	40-50 0032	NTC 3kΩ at 25°C (77°F)	B _{25/50} 3935	
AES-HTn10	40-50 0033	NTC 10kΩ at 25°C (77°F)	B _{25/50} 3935	
AES-HTn11	40-50 0034	NTC 10kΩ at 25°C (77°F)	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°F)	B _{25/50} 4200	
AES-HTn100	40-50 0036	NTC 100kΩ at 25°C (77°F)	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	DIN 43760	
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 Transformer	24 V AC 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 mm ² (AWG 24...12)	
Sensing Probe	Humidity Sensor: Range	Capacity sensor element 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):	NTC 0.5 K	
	0...50°C (32...122°F):	0.2 K	
	50...70°C (122...158°F):	0.5 K	
Platinum-Film: Range: (Probe only) Accuracy		PT according EN 60751 EN 60751, Class B +/- 0.3 at 0°C (32°F), 0.005 x t[K] for values away from 0°C (32°F).	
	Nickel Thin Layer: Range: (Probe only) Accuracy	1000 Ω at 0°C (32°F), 5000 ppm/K DIN 43760 +/- 0.4 at 0°C (32°F), <0°C(32°F) 0.028 x t[K], >0°C(32°F) 0.007 x t[K]	
Signal Outputs	Analog Outputs	DC 0-10V or 0...20mA	
	Output Signal Resolution	10 Bit, 9.7 mV, 0.019.5 mA	
	Maximum Load	Voltage: ≥1kΩ Current: ≤500Ω	
Environment	Operation Climatic Conditions	To IEC 721-3-3 class 3 K5	
	Temperature	-40...70°C (-40...158°F)	
	Humidity	<95% R.H. non-condensing	
	Transport & Storage Climatic Conditions	To IEC 721-3-2 and IEC 721-3-1 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	 conformity	EMC Directive	2004/108/EC
		Low Voltage Directive	2006/95/EC
	Product standards Automatic electrical controls for household and similar use	EN 60 730 -1	
	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	IP60	
	Mounted probe down with AMS-1	IP63	
Safety Class	III (IEC 60536)		
General	Material:	Cover, back part Filter material	PC+ABS (UL94 class V-0) PTFE coated 1µm pores
	Dimensions (H x W x D):	Transmitter case: Probe:	68 x 91 x 47mm (2.7" x 3.7" x 1.9") 14 x 77/157 mm (0.55 x 3/6.2")
	Weight (including package)	SDC-H1T-08 SDC-H1T-16	225g (7.9 oz) 260g (9.2 oz)

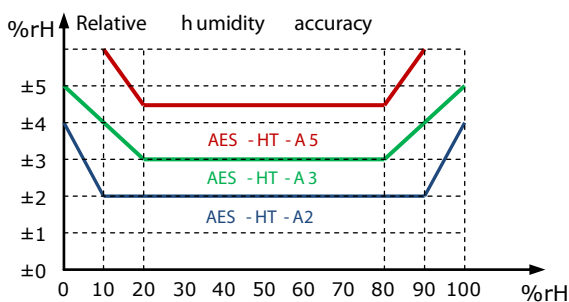
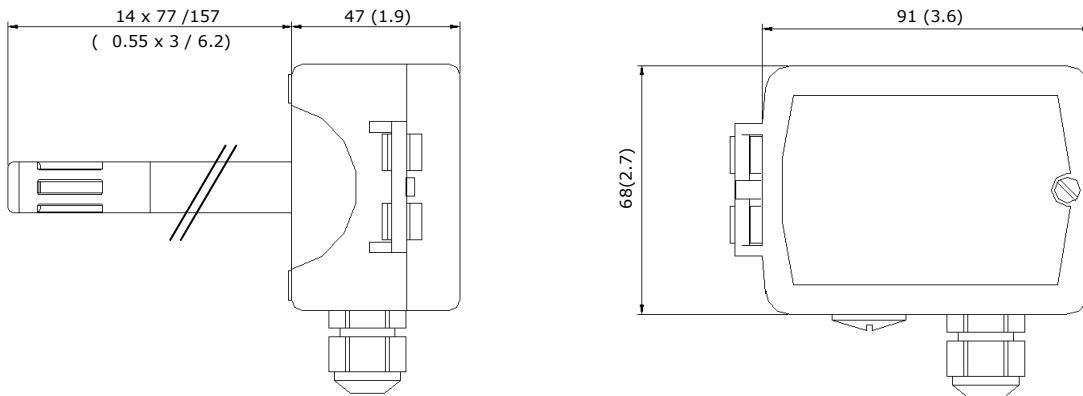


Figure 1: Max RH-tolerance at 25°C (77°F) per sensor type

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 Duct controller should be installed directly on the duct, in an area where the air stream is well mixed:

Locate a supply air sensor two or three meters downstream from the nearest fan and coil.

Mount the return air sensor close to the air inlet but downstream from a return fan if one is present.

Warning about storage, packaging and usage environment

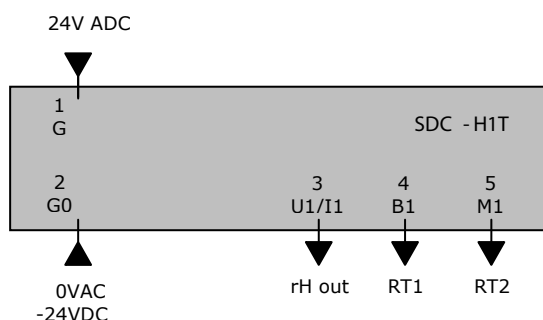
The sensing part is a polymer, which measures the humidity in the ambient air. For proper sensor operation some mandatory precautions need to be taken during storage, packaging and usage.

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. Drill a hole with a diameter of 16mm (5/8") in the air duct. Drill two more smaller holes for the self tapping screws diagonal on a diameter of 92mm (3.6"). A drilling diagram is attached to the install sheet.
2. Open the single screw on the cover and remove cover.
3. Connect the conductors to the terminals of the back part according to wiring diagram.
4. Insert the probe in the hole; secure the back part to the duct with two self-tapping screws.
5. While in the open position, slide the two hooks of the cover into the latch at the left side of the back part.
6. Close the front part.
7. With a Philips-type screw driver of size #2, carefully tighten the front holding screw to secure the cover to the back part. This screw is located on the front right side of the front part. There is no need to tighten the screw too much.

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

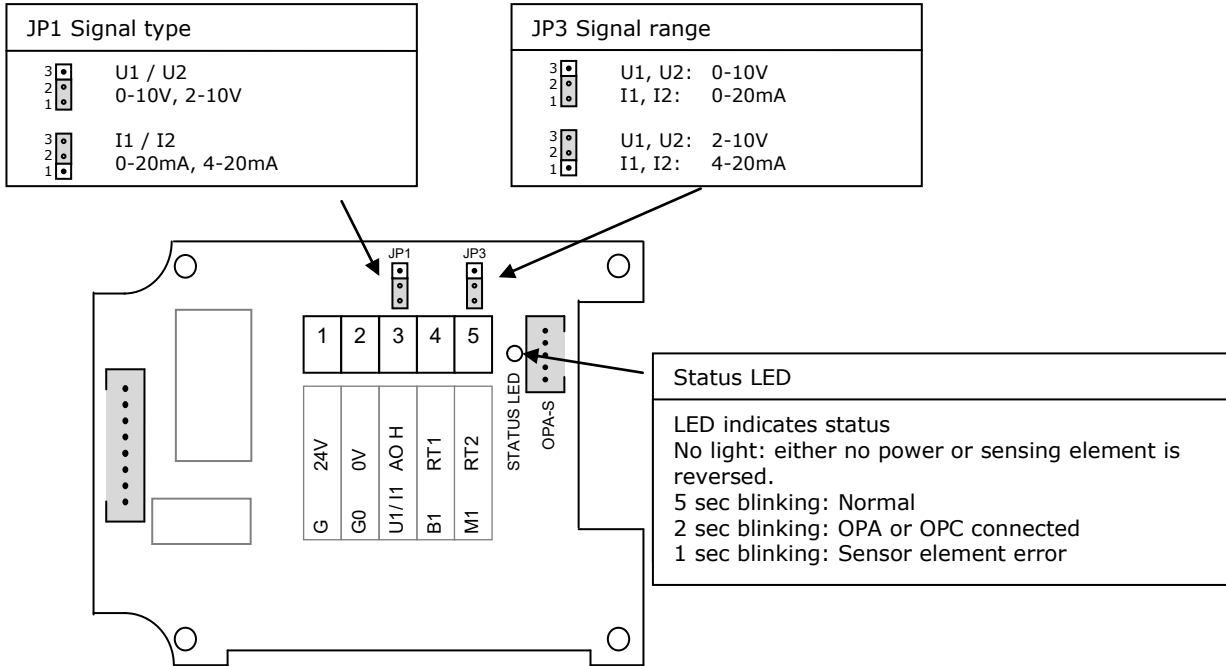
The analog output signal type may be configured with a jumper for 0-10 VDC or 0-20 mA control signals. The jumpers are located next to the terminal connector of each analog output. See table below for jumper placement. The factory setting is to 0-10 VDC.

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

