SDC-H1T1
Duct Humidity & Temperature Transmitter

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 & Temperature Transmitter

A unique capacitive sensor element is used for measuring relative humidity while temperature is measured by a band-gap sensor. The applied measuring technology guarantees excellent reliability and long term stability. The microprocessor samples the humidity and temperature once per second. It calculates an averaging signal over a preset number of seconds and generates the output signal based on lower and upper signal range values. Standard range is 0…100% rH, -40…60°C (-40…140°F) and 10 seconds average. The signal range of the temperature measurement and the averaging samples may be customized.
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.

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-H1T1-08	40-30 0064	Signal converter for duct mounting: probe length 77mm (3”)	
SDC-H1T1-16	40-30 0065	Signal converter for duct mounting: probe length 157mm (6.2”)	
SDC-H1T1-x-W0	40-30 00xx-0	**0**	**Temperature Range: -40…60°C (-40…140°F) (Default)**
SDC-H1T1-x-W1	40-30 00xx-1	1	Temperature Range: -35…35°C (-31…95°F)
SDC-H1T1-x-W2	40-30 00xx-2	2	Temperature Range: 0…50°C (32…122°F)
SDC-H1T1-x-W3	40-30 00xx-3	3	Temperature Range: Special – Specify in order

Sensor element

Item Name	Item Code	Humidity Accuracy [%rH]	Temperature Accuracy [K] @25°C (77°F)	Description/Option
AES-HT-A2	40-50 0031-2	2%	± 0.5°	Humidity - temperature sensor element
AES-HT-A3	40-50 0031-3	3%	± 0.4°	
AES-HT-A5	40-50 0031-5	4.5%	± 0.3°	

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 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: Range Measuring Accuracy Repeatability		Bandgap sensor -40…70°C (-40…158°F) 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 20 mA, 500Ω
Environment	Operation Climatic Conditions Temperature Humidity		To IEC 721-3-3 class 3 K5 -40…70°C (-40…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 -40…80°C (-40…176°F) <95% R.H. non-condensing class 2M2
Standards	CE conformity EMC Directive Low Voltage Directive		 2004/108/EC 2006/95/EC
	Product standards Automatic electrical controls for household and similar use Special requirement on temperature dependent controls		EN 60 730 –1 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 Mounted probe down with AMS-1		IP60 IP63
	Safety Class		III (IEC 60536)
General	Housing Materials:	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 (inc. package)	SDC-H1T1-08 SDC-H1T1-16	225g (7.9 oz) 260g (9.2 oz)

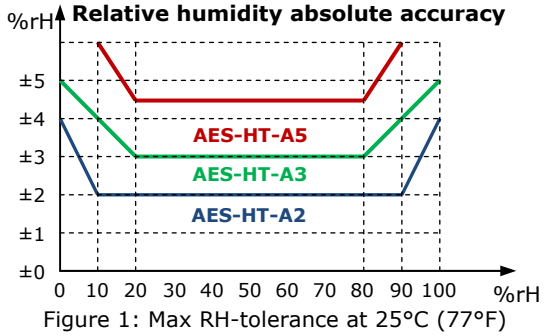

Figure 1: Max RH-tolerance at 25°C (77°F) per sensor type

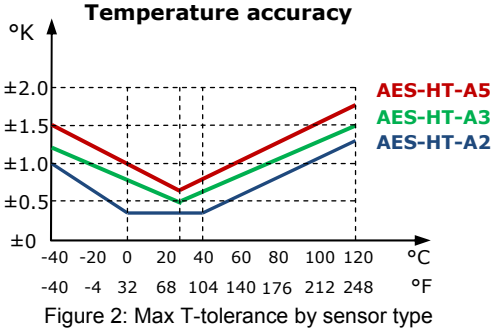

Figure 2: Max T-tolerance by sensor type

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 a dry, protected 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.
- At least three duct diameters away from a bend or another source of turbulence.

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. Stick the round seal on the back part to prevent air leakage.
2. Turn the single screw on the cover counterclockwise and remove cover.
3. Drill a hole with a diameter of 16mm (5/8”) in the air duct.
4. Insert the back part and mark the location for the mounting holes on the duct. Remove the back part from the duct.
5. Drill two holes for the duct screws or use self tapping screws diagonal according to the marks made in previous step.
6. Insert the probe in the hole; secure the back part to the duct with two screws.
7. Connect the conductors to the terminals of the back part according to wiring diagram.
8. While in the open position, slide the two hooks of the cover into the latch at the left side of the back part.
9. Close the front part.
10. 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.

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: U2	JP2 = 1-2, voltage output of temperature transmitter 0…10V or 2…10V (JP3)
4: I2	JP2 = 2-3, current output of temperature transmitter 0…20mA or 4…20mA (JP3)

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 or OP04 and OP05 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	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

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%

Replacing the sensing element