SDC-H1T1 Duct Humidity and Temperature Transmitter

Features

- Replaceable sensor element
- Humidity and temperature measurement for air ducts
- Minimum and maximum value memory
- 0…10 V, 0…20 mA or 2…10 V, 4…20 mA output selectable with jumpers
- Optional alternative signal ranges programmable
- Selectable averaging signal
- Optional LCD display (OPC-S) or external display (OPU-S)
- Status LED



Applications

- Humidity and 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 and 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. Standard output signal range and types may be selected by jumpers. Standard signal ranges are: 0…10 VDC, 0…10 VDC, 4…20 mA and 0…20 mA. Other ranges can be defined by using a programming tool (OPU-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

Per default a sensor element with 3% RH accuracy and a PG9 cable gland for cables ∅ 4 – 8 mm (AWG 6 – 1) (item name AMC-1) is included. Contact your local sales contact to order different probe length, sensing elements with different accuracies or if you prefer a sensor with conduit connectors or a built in display module.

Signal converter

Item Name	Item Code	Description/Option	
SDC-H1T1-08-A3-1	40-30 0150	Probe length 8 cm (3”), incl. cable gland AMC-1 and a sensor AES3-HT-A3	
SDC-H1T1-16-A3-1	40-30 0151	Probe length 16 cm (6.2”), incl. cable gland AMC-1 and a sensor AES3-HT-A3	
SDC-H1T1-24-A3-1	40-30 0110	Probe length 24 cm (9.4”), incl. cable gland AMC-1 and a sensor AES3-HT-A3	
SDC-H1T1-x-A3-1-W0	40-30 0xxx-0	**0**	**Temperature Range: -40…60°C (-40…140°F) (default)**
SDC-H1T1-x-A3-1-W1	40-30 0xxx-1	1	Temperature Range: -35…35°C (-31…95°F)
SDC-H1T1-x-A3-1-W2	40-30 0xxx-2	2	Temperature Range: 0…50°C (32…122°F)
SDC-H1T1-x-A3-1-W3	40-30 0xxx-3	3	Temperature Range: Special – Specify in order

Sensor element (for replacement only)

Item Name	Item Code	Humidity Accuracy [%RH]	Temperature Accuracy [K] @25 °C (77 °F)	Description/Option
AES3-HT-A2	40-50 0102	± 2%	± 0.3°	Humidity - temperature sensor element
AES3-HT-A3	40-50 0103	± 3%	± 0.4°	
AES3-HT-A5	40-50 0104	± 5%	± 0.5°	

Accessories

Item Name	Item Code	Description/Option
OPC-S	40-50 0029	Built in display and programming module
OPU-S	40-50 0006	External display module
AMS-1	20-10 0116	Weather shield to protect the sensor element
AMC-2	40-50 0074	Conduit connector NPT 1/2

Technical Specification

Warning! Safety advice! This device is intended to be used for comfort applications. Where a device failure endangers human life and/or property, it is the responsibility of the owner, designer and installer to add additional safety devices to prevent or detect a system failure caused by such a device failure. The manufacturer of this device cannot be held liable for any damage caused by such a failure. Failure to follow specifications and local regulations may endanger life, cause equipment damage and void warranty.

Power supply	Operating voltage Transformer		24 V AC 50/60 Hz ± 10%, 24 VDC ± 10% SELV to HD 384, Class II, 48 VA 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 0-10 V or 0…20 mA 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 -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		EN 60 730 –1
	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 47 mm (2.7" x 3.7" x 1.9") ∅ 14 x 77/157 mm (∅ 0.55 x 3/6.2")
	Weight (incl. package)	SDC-H1T1-08-A3-1 SDC-H1T1-16-A3-1	227g (7.9 oz.) 262g (9.2 oz.)

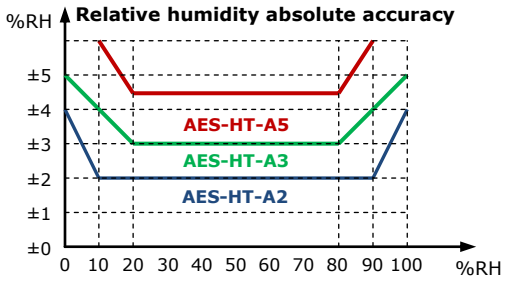


Figure 1: Max RH-tolerance at 25 °C (77 °F) per sensor type

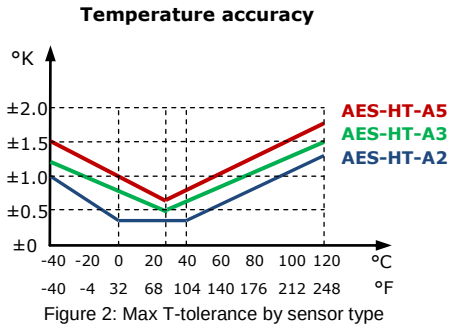
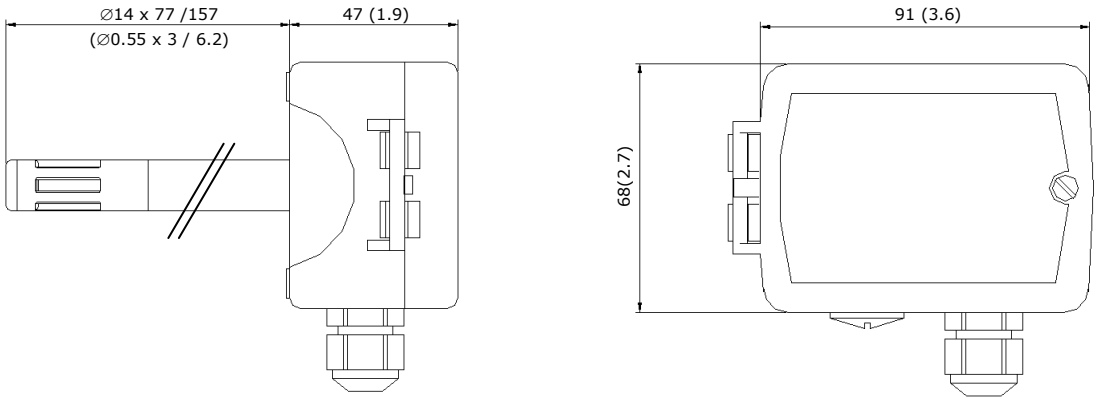


Figure 2: Max T-tolerance by sensor type

Dimensions mm(inch)



Installation and Storage

Mounting location

The transmitter should be installed 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.

Mounting instruction / replacing the sensor element

See installation sheet no. 70-000525 (www.vectorcontrols.com).

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 (duct tape, Scotch® tape 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.

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 OPU-S or OPC-S. The OPU-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%

Output signal configuration

Signal Type	JP1, JP2

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.

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

