

SRC-H1T Indoor humidity transmitter & temperature sensor

Features

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

Applications

- Indoor humidity & temperature measurement for heating, ventilation and air conditioning applications
- 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. Standard output signal range and types may be selected by jumpers. Standard signal ranges are: 0...10VDC, 0...10VDC, 4...20mA and 0...20mA. Other ranges can be defined by using a programming tool (OPA-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.

Accuracy advice for the passive sensor input

The transmitter is an electronic device that generates heat during operation. The humidity output is compensated in software against this drift. The passive temperature probe is not. Large differences of up to +3°C (6°F) can occur. It is thus recommended to compensate the passive input after installation and operation for > 1 hour or use SRA-T or SRC-H1T1 instead to measure indoor temperature.

Ordering

Per default a sensor element with 3% RH accuracy, an NTC 10kΩ temperature sensor is included. Contact your local sales contact to order sensing elements with different accuracies and temperature curves.

Humidity transmitter and temperature sensor

Item Name	Item code	Description/Option
SRC-H1Tn10-A3	40-300141	Transmitter for humidity with temperature probe

Sensor element

Item Name	Item code			Description/Option
AES3-HTn3-Ax	40-500117	NTC 3kΩ at 25°C (77°F)	B _{25/50} 3935	
AES3-HTn10-Ax	40-500118	NTC 10kΩ at 25°C (77°F)	B _{25/50} 3935	
AES3-HTn11-Ax	40-500119	NTC 10kΩ at 25°C (77°F)	B _{25/50} 3630	
AES3-HTn12-Ax	40-500127	NTC 10kΩ at 25°C (77°F)	B _{25/50} 3380	
AES3-HTn20-Ax	40-500120	NTC 20kΩ at 25°C (77°F)	B _{25/50} 4200	
AES3-HTn100-Ax	40-500121	NTC 100kΩ at 25°C (77°F)	B _{25/50} 4200	
AES3-HTp1-Ax	40-500123	PT100	EN60751	
AES3-HTp2-Ax	40-500124	PT1000	EN60751	
AES3-HTk5-Ax	40-500125	NI1000	5000 ppm/K	
AES3-HTxx-A2	40-5000xx-2	2%		Accuracy Option of Humidity - sensor element
AES3-HTxx-A3	40-5000xx-3	3%		
AES3-HTxx-A5	40-5000xx-5	5%		

Accessories

Item Name	Item code	Description/Option
OPA-S	40-500006	External display module

Technical Specifications

Important notice and safety advice

This device is for use as a humidity transmitter and temperature sensor. 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.

Power supply	Operating Voltage	24 VAC 50/60 Hz \pm 10%, 24 VDC \pm 10%	
	Transformer	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:	Capacity sensor element	
	Range	0...100 % rH	
	Measuring Accuracy	See Figure 1	
	Hysteresis	\pm 1%	
	Repeatability	\pm 0.1%	
Passive sensor	Stability	< 0.5% / year	
	Accuracy Warning: The transmitter is an electronic device that generates heat during operation. The transmitter is compensated in software against this drift. The passive probe is not. Large differences of up to 3°C (6°F) can occur. It is thus recommended to compensate the passive input after installation or use SRA-T or SRC-H1T1 instead.		
Passive sensor	Thermistor:	NTC	
	Accuracy:	0.2 K	
	Platinum-Film:	PT according EN 60751	
	Accuracy	EN 60751, Class B	
Passive sensor	Nickel Thin Layer:	1000 Ω at 0°C, 5000 ppm/K	
	Accuracy	DIN 43760	
Signal outputs	Analog Outputs		
	Output Signal	DC 0-10V or 0...20mA	
	Resolution	10 Bit, 9.7 mV, 0.019.5 mA	
	Maximum Load	Voltage: \geq 1k Ω Current: \leq 250 Ω	
Environment	Operation	To IEC 721-3-3	
	Climatic Conditions	class 3 K5	
	Temperature	0...70°C (32...158°F)	
	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	
Environment	Temperature	0...70°C (32...158°F)	
	Humidity	<95% R.H. non-condensing	
Environment	Mechanical Conditions	class 2M2	
Standards		conformity	
		EMC Directive	2014/30/EU
		Low Voltage Directive	2014/35/EU
	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	IP30 to EN 60 529	
	Safety Class	III (IEC 60536)	
General	Housing Materials Cover	Fire proof PC+ABS plastic (UL94 class V-0)	
	Mounting Plate	Galvanized Steel	
	RoHS compliant according to	2011/65/EU	
	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)	

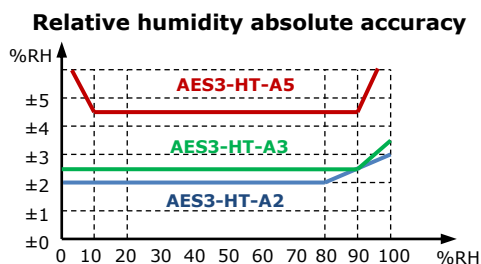
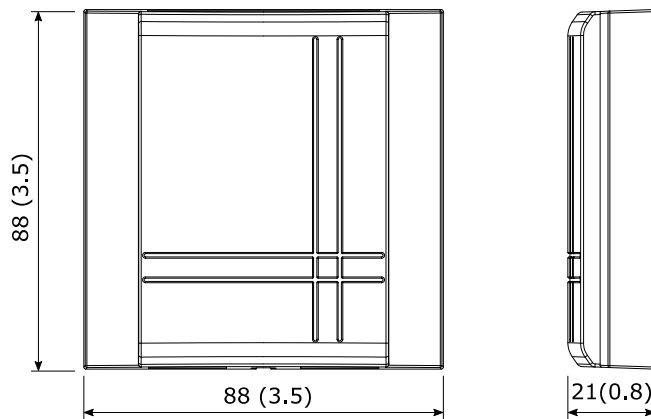


Figure 1: Max RH-tolerance at 25 °C (77 °F) per sensor type

Note on accuracy: allow one hour after power up for compensation swing in

Dimension mm (inch)**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

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.

Mounting instruction / replacing the sensor element

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

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	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%

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)

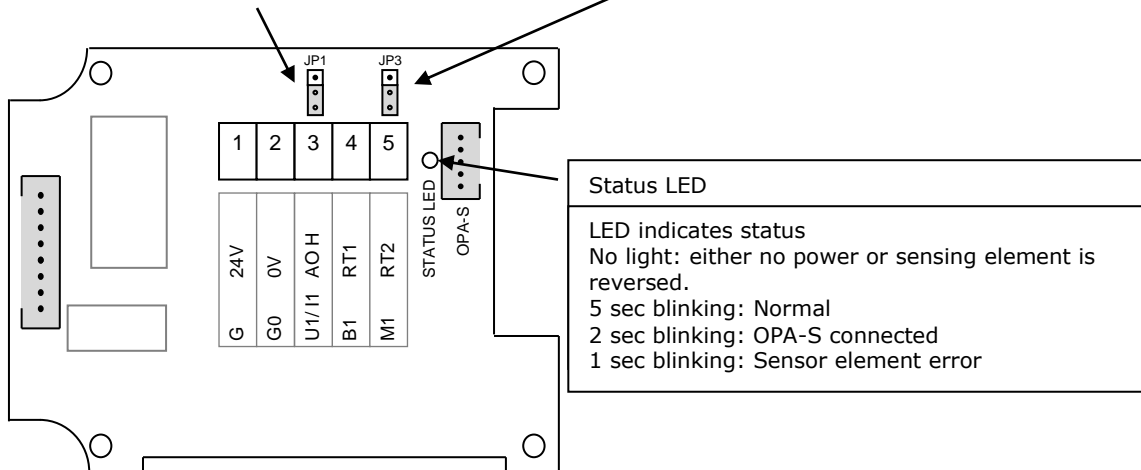
The signal range may be set with JP3 for both analog outputs. JP3 will only operate if the output range specified with OP01 and OP02 is left at the default position of 0...100%. With any other setting the position of JP3 has no influence and the range defined with the output parameters applies.

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

Jumper settings

JP1 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



Resistance table for thermistors (NTC)

°C	°F	Tn3 [kΩ]	Tn5 [kΩ]	Tn10 [kΩ]	Tn11 [kΩ]	Tn12 [kΩ]	Tn20 [kΩ]	Tn100 [kΩ]
B_{25/50}		3935	3470	3935	3630	3380	4200	4200
B_{25/85}		3974	3535	3974	3687	3435	4260	4260
B_{25/100}		3988	3526	3988	3715	3455	4285	4285
Signal type →		NTC 3k	NTC 5k	NTC 10k-2	NTC-10k-3		NTC 20k	NTC 100k
-50	-58	201,1	161,9	670,2	441,3	329,2	1711	8558
-40	-40	100,9	89,49	336,4	239,7	188,4	814,0	4095
-30	-22	53,09	54,07	177,0	135,3	111,3	415,6	2077
-20	-4	29,12	33,21	97,08	78,91	67,74	220,6	1105
-10	14	16,60	21,07	55,33	47,54	42,45	122,4	612,4
0	32	9,795	13,73	32,65	29,49	27,28	70,20	351,0
10	50	5,969	9,041	19,90	18,79	17,96	41,56	207,8
20	68	3,747	6,064	12,49	12,26	12,09	25,34	126,7
25	77	3,000	5,000	10,00	10,00	10,00	20,00	100,00
30	86	2,417	4,139	8,057	8,194	8,313	15,88	79,43
40	104	1,598	2,875	5,327	5,592	5,828	10,21	51,06
50	122	1,081	2,032	3,603	3,893	4,161	6,718	33,60
60	140	0,746	1,463	2,488	2,760	3,021	4,518	22,59
70	158	0,525	1,069	1,751	1,990	2,229	3,100	15,50
80	176	0,376	0,792	1,255	1,458	1,669	2,168	10,84
90	194	0,275	0,601	0,915	1,084	1,266	1,542	7,707
100	212	0,203	0,464	0,678	0,817	0,973	1,114	5,571
110	230	0,536	0,354	0,512	0,624	0,752	0,818	4,092
120	248	0,123	0,272	0,410	0,481	0,605	0,609	3,046
130	266	0,097	0,212	0,322	0,380	0,487	0,460	2,298
140	284	0,077	0,169	0,257	0,300	0,395	0,351	1,755
150	302	0,063	0,137	0,210	0,240	0,325	0,271	1,356

Resistance table for platinum film and NI1000 elements

°C	°F	Tp1 [Ω]	Tp2 [Ω]	Tk5 [Ω]	Tk6 [Ω]
		PT100 DIN 60751	PT1000 DIN 60751	NI1000, K=5000	NI1000 K=6180
-50	-58	80,28	803,0	790,88	742,55
-40	-40	84,27	843,0	830,84	791,31
-30	-22	88,22	882,0	871,69	841,46
-20	-4	92,16	922,0	913,48	892,96
-10	14	96,09	961,0	956,24	945,82
0	32	100,00	1000,0	1000	1000
10	50	103,90	1039,0	1044,79	1055,52
20	68	107,79	1078,0	1090,65	1111,36
30	86	111,67	1117,0	1137,62	1170,56
40	104	115,54	1155,0	1185,71	1230,11
50	122	119,40	1194,0	1234,98	1291,05
60	140	123,24	1232,0	1285,45	1353,40
70	158	127,07	1270,5	1337,15	1417,21
80	176	130,89	1309,0	1390,12	1482,50
90	194	134,70	1347,0	1444,39	1549,34
100	212	138,50	1385,0	1500,00	1617,79
110	230	142,29	1423,0	1556,98	1687,89
120	248	146,06	1460,5	1615,37	1759,72
130	266	149,80	1498,0	1675,19	1833,35
140	284	153,60	1536,0	1736,48	1908,87
150	302	157,30	1573,0	1799,27	1986,35
160	320	161,05	1610,5	1863,60	2065,89
170	338	164,75	1647,5	1929,50	2147,58
180	356	168,45	1684,5	1997,00	2231,53
190	374	172,15	1721,5	2066,15	2317,83
200	392	175,85	1758,5	2136,96	2406,60

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