

SRC-H1T Indoor Humidity Transmitter and 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 output selectable with jumpers
- Programmable signal ranges and averaging signal
- Optional external display (OPU-S)
- Status LED

Applications

- Indoor humidity & temperature measurement for HVAC 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...10VAC, 4...20mA and 0...20mA. Other ranges can be defined by using a programming tool (OPU-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 us 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, a 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	40-30 0141	Transmitter for humidity with temperature probe

Sensor element


Item Name	Item Code			Description/Option
AES1-HTn3-Ax	40-50 0077	NTC 3kΩ at 25°C (77°F)	B _{25/50} 3935	
AES1-HTn10-Ax	40-50 0075	NTC 10kΩ at 25°C (77°F)	B _{25/50} 3935	
AES1-HTn11-Ax	40-50 0079	NTC 10kΩ at 25°C (77°F)	B _{25/50} 3630	
AES1-HTn12-Ax	40-50 0048	NTC 10kΩ at 25°C (77°F)	B _{25/50} 3380	
AES1-HTn20-Ax	40-50 0081	NTC 20kΩ at 25°C (77°F)	B _{25/50} 4200	
AES1-HTn100-Ax	40-50 0083	NTC 100kΩ at 25°C (77°F)	B _{25/50} 4200	
AES1-HTp1-Ax	40-50 0085	PT100	EN60751	
AES1-HTp2-Ax	40-50 0087	PT1000	EN60751	
AES1-HTk5-Ax	40-50 0089	NI1000	5000 ppm/K	
AES1-HTxx-A2	40-50 00xx-2	2%		Accuracy Option of Humidity - sensor element
AES1-HTxx-A3	40-50 00xx-3	3%		
AES1-HTxx-A5	40-50 00xx-5	5%		

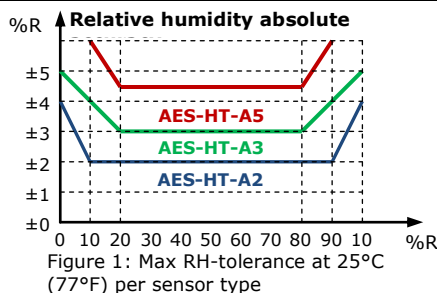
Accessories

Item Name	Item Code	Description/Option
OPU-S	40-50 0030	External display module

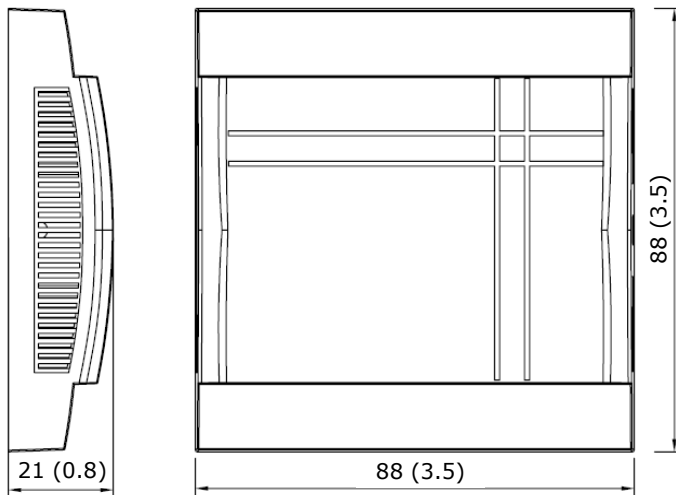
Technical Specification

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	24 V AC 50/60 Hz \pm 10%, 24VDC \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%
	Stability	< 0.5% / year
Passive Sensor	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.	
	Thermistor:	NTC
	Accuracy:	0.2 K
	Platinum-Film:	PT according EN 60751
	Accuracy	EN 60751, Class B
	Nickel Thin Layer:	1000 Ω at 0°C, 5000 ppm/K
Signal Outputs	Accuracy	DIN 43760
	Analog Outputs	DC 0-10V or 0...20mA
	Output Signal	10 Bit, 9.7 mV, 0.019.5 mA
	Resolution	Voltage: \geq 1k Ω Current: \leq 500 Ω
Maximum Load	Maximum Load	
	Environment	
	Operation	To IEC 721-3-3
	Climatic Conditions	class 3 K5
Temperature	Temperature	0...60°C (32...140°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
Temperature	Temperature	-40...70°C (-40...158°F)
	Humidity	<95% R.H. non-condensing
	Mechanical Conditions	class 2M2
Standards		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	
	IP30 to EN 60 529	
Safety Class	III (IEC 60536)	
General	Housing Materials Cover	Fire proof ABS plastic
	Mounting Plate	Galvanized Steel
	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.)



Note on accuracy: Allow 1 hour after power up for compensation swing in until described accuracy is reached.

Dimensions mm(inch)**Mechanical Design and Installation**

The unit consists of two parts: (a) The mounting plate and (b) the cover with the transmitter.

Mounting location

Mount the transmitter on a flat interior wall of the room to be controlled. Do avoid obstructions such as shelves, curtains and recesses. Do not place near heat sources, draft channels. Do not expose to 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 (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.

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 OPU-S. The OPU-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)

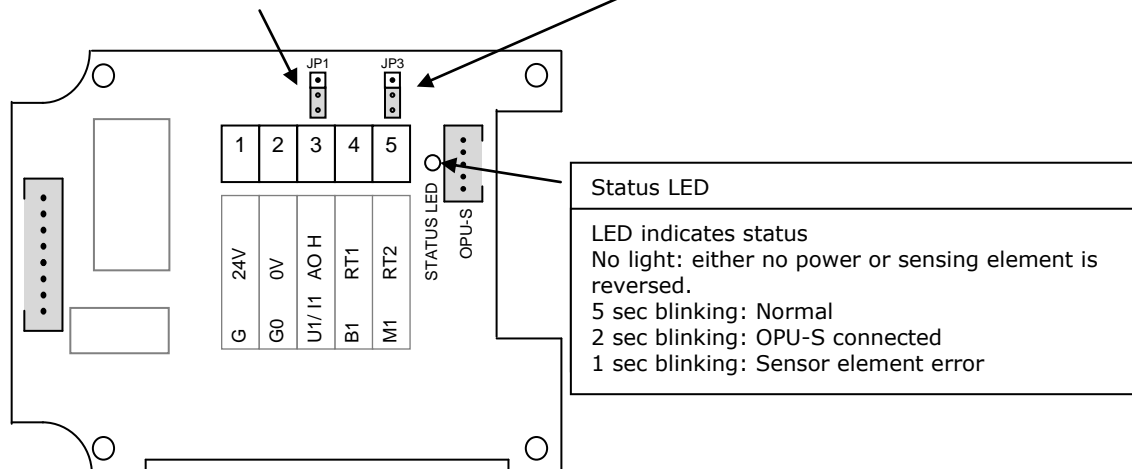
The signal range may be set with JP3 for both analog outputs. JP3 will only operate if the output range specified with OP01 and OP02 is left at the default position of 0...100%. With any other setting the position of JP3 has no influence and the range defined with the output parameters applies.

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