



HUMIDITY/TEMPERATURE-TRANSMITTER WITH TTL COMPATIBLE FREQUENCY OUTPUT

Computerised data acquisition systems involved in process control are continuously recording and analysing measuring values. Transmitters with analogue output signals need a converter before the signal is suitable for further digital processing.

Series EE25 humidity/temperature-transmitters do all the necessary signal processing and provide a pulsed current output signal for both humidity and temperature. Every microprocessor controlled system is able to read this data by simply counting the pulses without expensive A/D converting.

The transmitters use the E + E humidity sensors type HC1000. These elements offer high accuracy, low hysteresis, excellent long term stability and high resistance to pollutants.



Advantages of EE25 series:

- The output signal and the supply are transmitted by the same line, thus minimizing installation costs.
- By using low price comparator circuitry the current output signal can be converted into TTL-level.
- Signal transmission free from interference under hostile environmental conditions
- The resolution of the measurement can be tuned to the requirements of the customer by choice of the appropriate measuring time.

The transmitter series EE25 is designed for HVAC applications, building automation, swimming halls, green houses, stables, etc. For meteorological applications best results are achieved when the transmitters are combined with our radiation shields.


FEATURES

- Signal transmission free from interference under hostile environmental conditions
- Simple frequency counting instead of expensive A/D converting
- Low cost installation
- Measuring range 0...100 % RH
- Accuracy ± 2 % RH

TYPICAL APPLICATIONS

- process automation
- green houses
- agricultural applications
- meteorology

TECHNICAL DATA

	Humidity	Temperature
Sensor element	HC1000 ¹⁾	Pt 1000 (ToI.DIN A, DIN 60751)
Working range	0 ... 100 % RH	-20 ... 80 degC
Max. deviation from the output characteristics at 20 degC	±2 % RH (20 ... 90 %)/±4 % RH (0 ... 100 %)	±0,3 degC
Hysteresis 10% - 80% - 10%	<2 % RH	---
Temperature dependence	-0,15 % RH/degC typical	0,004 degC/degC
Output signal	puls rate n_H	pulse rate ratio k
Series EE 25 F ²⁾	62,3 ... 47,1 kHz RH(%) = 1073,85(1-3,4393E-2n _H +4,0466E-4n _H ² -1,7695E-6n _H ³)	---
Series EE 25 FT ²⁾	12,4 ... 9,4 kHz RH(%) = 1137,91(1-1,7596E-n _H +1,0642E-2n _H ² -2,3778E-4n _H ³)	0,6739 ... 1,000 T(degC) = 338,0*k - 258,2
Output current		
Series EE 25 F	I _L = 2,4mA ± 10% I _H = 4,0mA ± 10%	
Series EE 25 FT	I _L = 2,5mA ± 10% I _H = 5,0mA ± 10%	
Supply	U _S = 10 ... 30 VDC	
Max. load R _{load}	(U _S -10V)/I _H resp. 600 Ohm and max. 0,5 mH	
Max. connection length	depending on the cable type up to 1000m	
Connection	screw terminals (max. 1,5 mm ² single wire)	
Housing	PC-plastic/ IP65	
Sensor protection	membrane filter, sintered bronze filter, sintered stainless steel filter, PTFE filter, metal grid filter	
Electromagnetic compatibility according	EN 50081-1 EN 55104	
Temperature range	working range probe: -20 ... +80 degC working range electronic: -20 ... +60 degC storage temperature: -25 ... +60 degC	

1) Pay attention to the working range of the HC 1000!

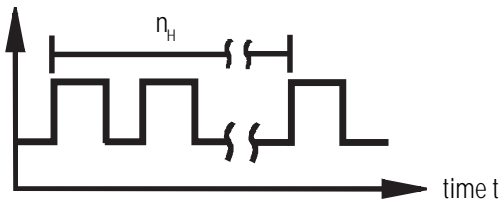
2) valid for a probe length of 50 mm (polynomial equations for other lengths on request)

technical data are subject to change

FUNCTIONING

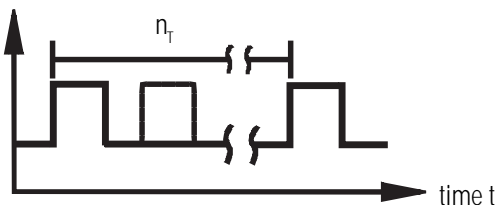
OUTPUT HUMIDITY

current i_H



OUTPUT TEMPERATURE

current i_T



The output signal of the EE25 transmitters for humidity and temperature are the pulsed current signals i_H and i_T (see figure). The current signals are comprised of a constant supply current and a superimposed contribution carrying the signal information. The pulse rates of these currents are analyzed.

Evaluation of the humidity:

The relative humidity is determined directly by the pulse rate n_H. The polynomial equation for the calculation is listed in the technical data.

Evaluation of the temperature:

Because of the required high accuracy of measurement of the temperature it is determined by the pulse rate ratio k = n_T/n_H. The polynomial equation for the calculation is listed in the technical data.

In using this concept, the customer can determine the resolution to his own requirements by choice of the appropriate measuring time. At a measuring time of 1 sec, at 76 % RH and 0 degC, a resolution of better than 0,03 % RH and 0,04 degC is obtained.

ACCESSORIES AND SPARE PARTS

Mounting device

For duct fixing we recommend to use the added mounting device.

The main features are as follows:

- penetration depth infinitely adjustable
- only one drilling whole in the duct channel necessary
- easiest mounting



Calibration set

The calibration devices are carefully designed for specific use with the EE 25 probe, to allow accurate and reliable calibration without influence from the surrounding air.

For reliable check and possible recalibration our special calibration set is available. (refer to data for „calibration set“)

As professional alternative we recommend use of our high accuracy humidity generator HUMOR10. (refer to data for „HUMOR10“)

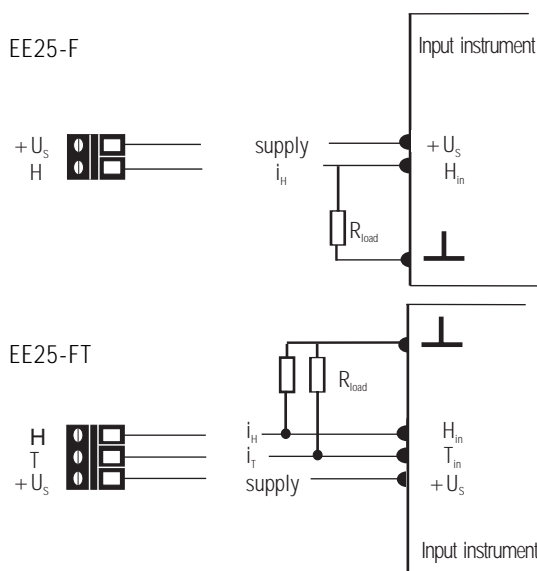
Dust filter caps

To protect the active surface of the humidity sensor from undue pollution, the sensor probes can be fitted with various dust filter caps, depending on the application.

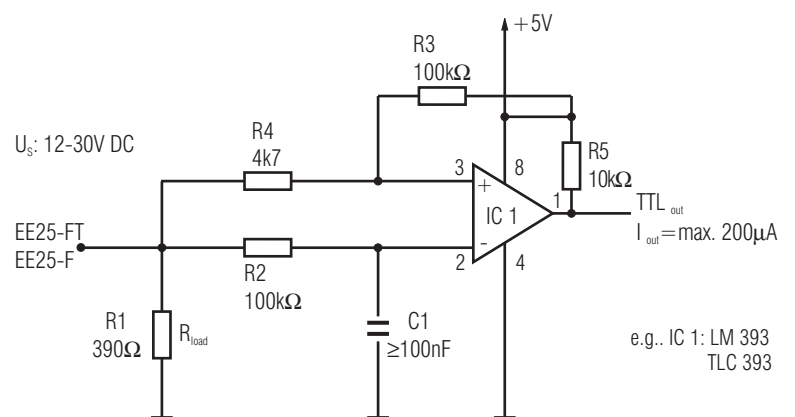
- Membrane filter:** for HVAC and room applications, little dust and pollution
- Sintered bronze filter:** mechanical stress, very dirty atmospheres
- Sintered stainless filter:** for industrial, agricultural and food applications, aggressive medium, mechanical and thermal stress.
- PTFE filter:** for chemical aggressive atmospheres
- metal grid filter:** for high humidities and short response time



CONNECTING DIAGRAM

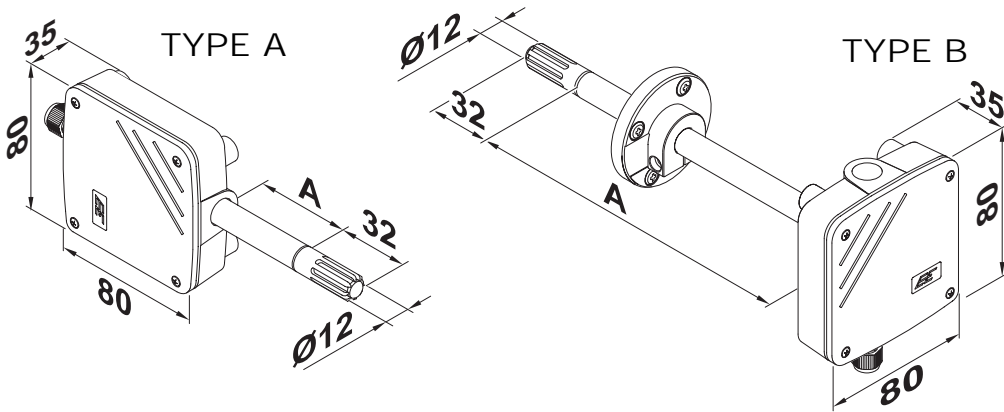


CIRCUIT DIAGRAM FOR TTL SIGNAL CONVERSION



Using a comparator with push-pull output stage R5 is cancelled!

HOUSINGS



Dimensions in mm

ORDER INFORMATION

SERIES	
EE 25	
CODE 1	MODEL
FT	humidity + temperature
F	humidity
CODE 2	HOUSING TYPE
A	for wall mounting
B	for duct mounting
CODE 3	PROBE LENGTH
2	50 mm
5	200 mm
0	others
CODE 4	FILTER
1	membrane filter
2	sintered bronze filter
3	sintered stainless steel filter
5	PTFE filter
6	metal grid

Order example: EE25-FTA21, model: humidity/temperature transmitter, housing: wall mounting, probe length: 50 mm, filter: membran filter

ACCESSORIES & SPARE PARTS

	Code
membrane filter	HA 01 01 01
sintered bronze filter	HA 01 01 02
sintered stainless steel filter	HA 01 01 03
PTFE-filter	HA 01 01 05
metal grid filter	HA 01 01 06
protection sleeve for sensor grobe	S01

	Code
calibration device	HA 01 04 01
humidity standards 10 % RH	HA 01 04 10
humidity standards 35% RH	HA 01 04 35
humidity standards 50 % RH	HA 01 04 50
humidity standards 80 % RH	HA 01 04 80
humidity standards 95% RH	HA 01 04 95

