copenhagen atomics
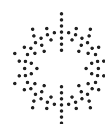
Humidity V1.7

Relative and absolute humidity measurements

Photo showing version 1.7

Introduction

Usage

The humidity sensor can measure humidity; absolute and relative and temperature. It uses two SHT45 sensor chips and gives output from both of the sensors.

The sensor only accepts a few commands; serial and burnin and normal. See Page 5 for more details.

The sensor is very sensitive to impurities in the gas stream. It can be calibrated both for normal air, argon and nitrogen atmosphere.

Data communication

Data communication happens over USB with the serial communication protocol (COM-port, /dev/ttyXX).

Baud rate 115200, with 8 data bits, no parity, and 1 stop bit. (8N1)

After you connect to the box it will output one line of text to the terminal every 0.1 second (10 Hz).

The content of this line is specified on the next page.

This video gives an introduction to serial data and commands: https://youtu.be/-64MM8h5SdI
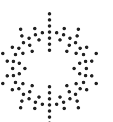
Introduction

Integration with TurboCtrl

TurboCtrl AutoConfig will detect the box and insert each channel in IO.conf as a humidity sensor. There are two sensor chips in this humidity sensor and therefore the plot will show temperature, absolute and relative humidity for both sensors, 6 lines in total in the vector.

This video gives an introduction to autoconfig: https://youtu.be/MhT1DqOuWLE

This video gives an introduction to TurboCtrl programming: https://youtu.be/MhT1DqOuWLE

TurboCtrl.ai supports many sensor and actuator types:
Temperatures, pressure, humidity, oxygen and other gasses, gas and liquid flow sensors, DC ports, AC ports, VFDs, current, voltage, oven controllers, light controllers, motors, audio, video, scales, position, liquid level, density, viscosity, integration with Festo and other pneumatics systems. And much more
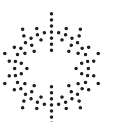
Buy connectors

The sensor come with a USB-C to USB-C cable included and standard DIN rail mounting. You do not need any other connectors or cables.

The thread is a G1/4 BSPS thread and comes with a compatible o-ring.

i For more information, please contact sales@copenhagenatomics.com

Specs

Serial terminal output (baud: 115200)

Output	temp 1	relative 1	absolute 1	temp 2	relative 2	absolute 2	Status code
Unit	[°C]	[%]	[g/m^3]	[°C]	[%]	[g/m^3]	[HEX]

IO config setup

| Format	Example	Description
Humidity;SensorName;BoxName	Humidity;TankOut;hm01	Will output all 6 values to plots. When using a sensor with PCB <=V1.1 the last three values will be set to –1. NB: Valid format from version >=3.150.0 and >=4.35.0

Commands

Command	Description
burnin	Decontamination mode. Heats up the sensor for 80 minutes to remove contamination substances from sensor polymer. Returns to normal mode after 80 minutes.
normal	Forces the box back into normal operation mode.
Status	Verbose output of the current box status.
Serial	Verbose output of serial number and calibration.

Specification

Parameter	Condition	Value	Unit(s)
Operational temperature.	min.	0	°C
	max.	80	°C
Relative humidity measurable range.	min.	0	%
	max.	100	%
Relative humidity accuracy*	typ.	±1.0	%
	max.	±3	%
Temperature accuracy*	max.	±0.6	°C
USB power	max.	0.005	W
USB current	max.	1	mA

* From sensor datasheet (SHT45), if fully calibrated.
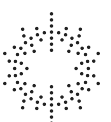
Specs

SHT45 sensor humidity and temperature accuracy

Datasheet: https://sensirion.com/media/documents/33FD6951/67EB9032/HT_DS_Datasheet_SHT4x_5.pdf
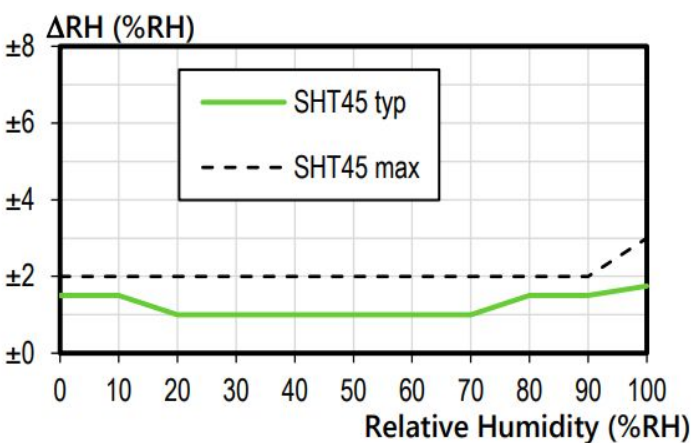
Humidity

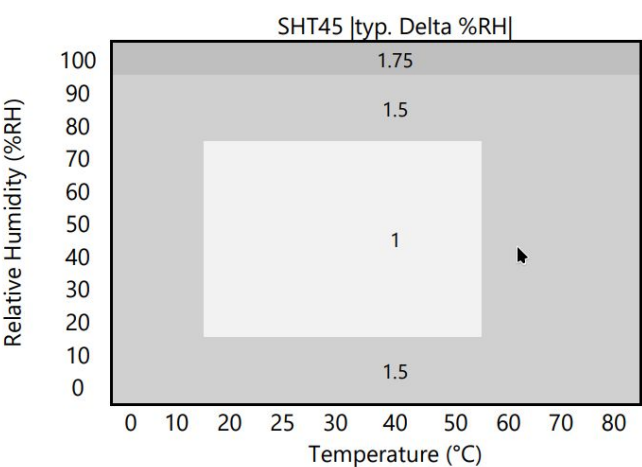Figure 5. SHT45 typical and maximal relative humidity accuracy at 25 °C.

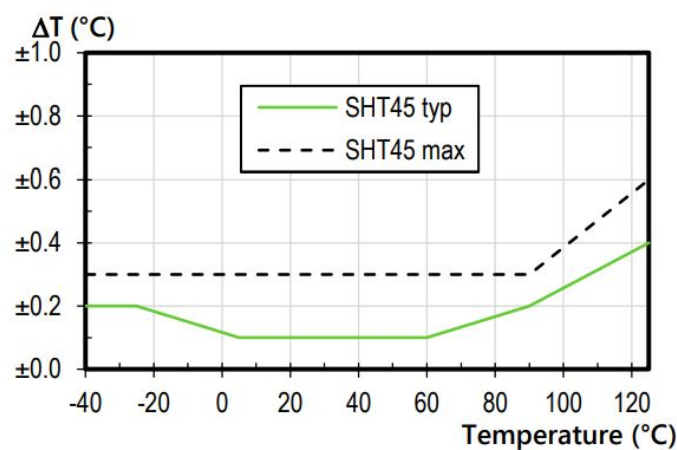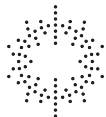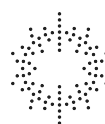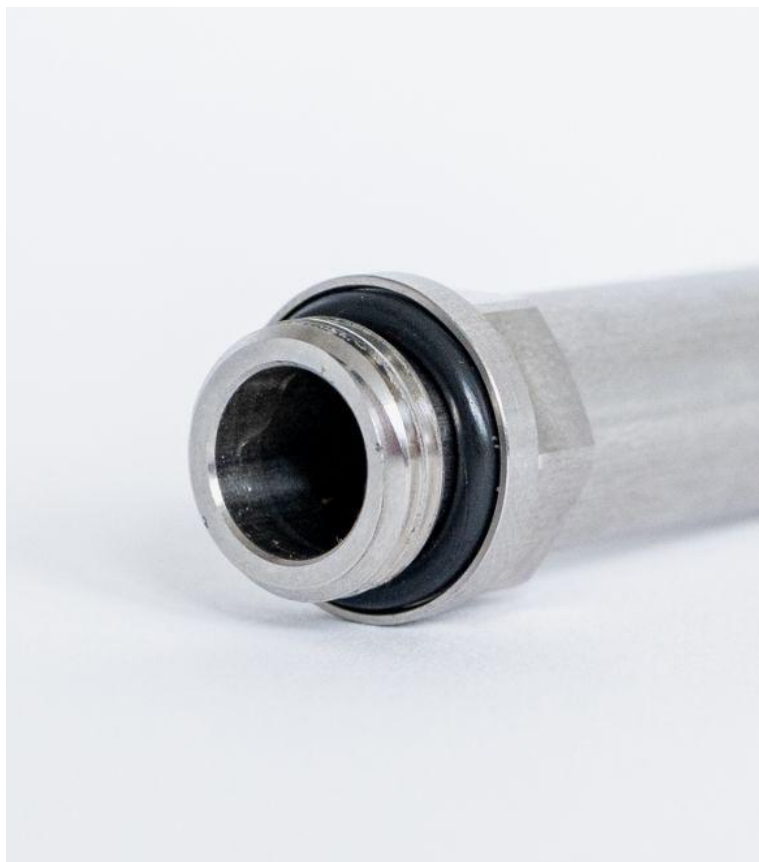Figure 9. Typical RH accuracy tolerance over humidity an temperature for SHT45.

Temperature

Figure 13. SHT45 typical and maximal temperature accuracy.

Product photos

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