Connecting a temperature sensor to a Greenspec system

Type Greenspec NTC10K, PT1000 and various NTC sensors

Data sheet of temperature sesnors supplied by Greenspec or other suppliers with instruction on connection to the Greenspec GSC.

Manufacturor: various suppliers

Application: measurement of temperature in greenhouse air, soil, irrigation water, heating circuit water, buffer tanks, in combination with other sensors like humidity or EC sensors.

Different types:

Main types used are the PT1000 and the NTC sensor. The PT1000 is more expensive, the NTC needs a software correction. This NTC-correction is provided in the Greenspec software. So both can be used.
Humid air and wet conditions may lead to water condensing inside of the sensor. Order a version with extra watertight socket. For temperatures over 70 °C at boilers etc. order the version with the red silicone outer tube.
The sensors are fixed in various holders, see examples at picture 2.
Versions with different cable length are available.

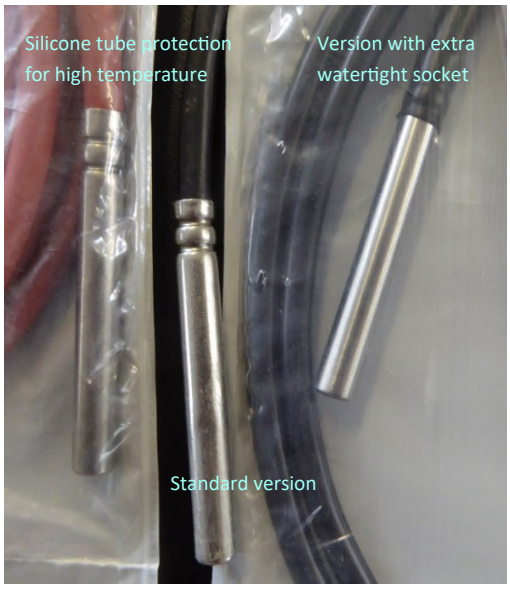
Hardware Installation

Temperature sensors are connected with 2 wires, see the schedule below.
And then they are mounted in various holders. They have a lifetime of easily 10 years, as long as no external damage happens like water leaking in the sensor.

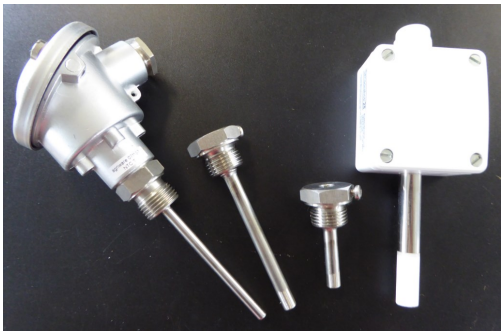
Electronic connection and calibration:

Below the installallation and connection for 5 types of sensor. For the NTC the resistance in Ω (Ohm) is given.
Greenspec NTC10K : (0°C .. 100°C)
Calibrate with the 3 factorsC1, C2, C3, see next page
Priva NTC 3K
Calibrate with the 3 factorsC1, C2, C3, see next page
MCU NTC (80K ..20 K) (0°C .. 60°C)
Calibrate with the 3 factorsC1, C2, C3, see next page
RAM NTC (5.237K ..0.408K)(0°C .. 60°C): needs an extra 1,8 KΩ resistor.
Calibrate with the 3 factorsC1, C2, C3, see next page
PT 1000 (different suppliers, also Greenspec)
No calibration factors needed.
If you want to use another NTC, ask your supplier for the factors C1, C2, C3. In the temperature sensor cal file add the parameters to the calibration table. See next page.

Picture 1: Different models:



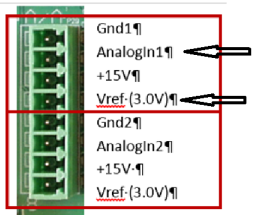
Picture 2: Different housings



Electrical connection:

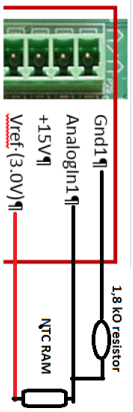
All sensors are connected to the AFP at an analog input. The 3 V power supply and the signal input are connected.

NTC sensors Greenspec, MTU, Priva:
Connect the cable at Analog signal and 3V:



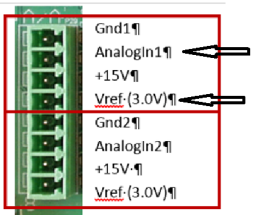
Set the dipswitch in the correct position:

NTC sensors RAM:
Connect the cable and Analog signal and 3V, mount a 1,8 KΩ resistor:



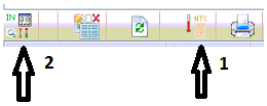
Set the dipswitch in the correct position

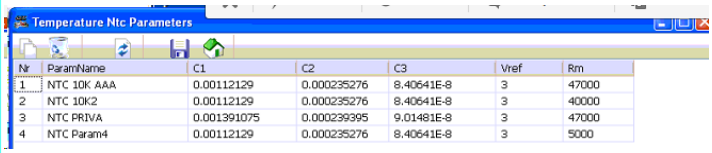
PT 1000: Connect the cable and Analog signal and 3V:

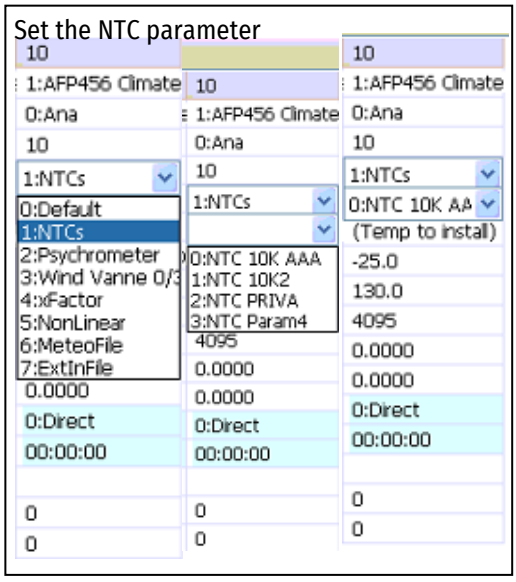


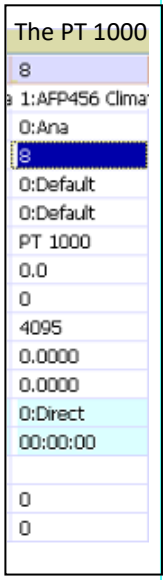
Set the dipswitch in the correct position

Software setting and calibration setting:
For all sensors choose 0: Ana.
Then for the NTCs choose 1: NTCs. NTCs have to be linearised.
For this select the NTC out of the ***list 1 , named NTC*** in the top bar.
For 4 of them the linearization parameters have been set.
This means that the values of the NTC are read into the Greenspec software without making a calibration necessary. You correct without calibrating with a precise second order calibration.

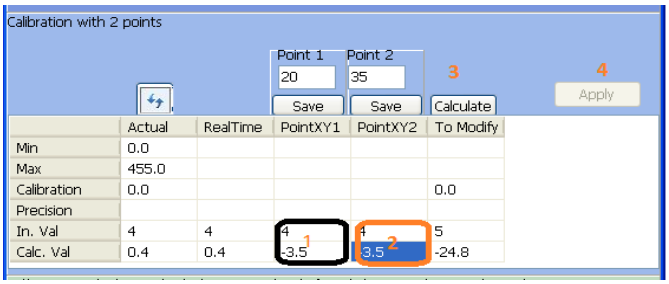








For a ***PT 1000***: you connect a 0 to 4 mA signal, see front page for the correct electrical connection.
Set the parameters as to the right:
For the calibration: ***open item 2 on the top bar.***
Choose 2 temperatures for the range you want to use for calibration, fill them in at Point 1 and Point 2. Wait until the temperature1 is stabilized and click save. Wait until temperature 2 is stabilized and click save: the values in box 1 and 2 will appear. Click 3: calculate and the line will be calculated. Click on 4: apply



After the calibration of the sensors save the settings by clicking on the green confirm sign. Close the window by clicking on the X

Technical specifications

NTC	**Negative Temperature Coefficient semi-conductor sensor**
materials	Metal housing cable PVC or for high temperatures silicone
Electrical connection	15V, power consumption 0,6 VA
Signal output	4-20 mA, range
	Accuracy ±0.3°C (from -40°C to 70°C) ; ±0.5°C (outside the -40 to +70°C temperature range), response time 15 s
Further specs	CE certification: 2004/108/EC EMC ; 2006/95/EC Low Voltage ; 2011/65/EU RoHS II ; 2012/19/EU WEEE Ambient conditions: 0-50 ◦C, non-condensing
PT 1000	**PT 1000 platina sensor**
materials	Metal housing cable PVC or for high temperatures silicone
Electrical connection	15V, power consumption 0,6 VA
Signal output	0-4 mA, range
	Accuracy ±0.3°C (from -40°C to 70°C) ; ±0.5°C (outside the -40 to +70°C temperature range), response time 15 s
Further specs	CE certification: 2004/108/EC EMC ; 2006/95/EC Low Voltage ; 2011/65/EU RoHS II ; 2012/19/EU WEEE Ambient conditions: 0-50 ◦C, non-condensing

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