7. HUMIDITY/TEMPERATURE CALIBRATION

The EE36 transmitter series can be calibrated in two ways:

- 1-point humidity/temperature calibration: quick and simple calibration on a defined humidity/ temperature point (working point).
- 2-point humidity/temperature calibration: simple calibration for accurate measuring results over the whole humidity/temperature working range.

- To reach a temperature balance it is recommended to keep the transmitter and the reference chamber (e.g. HUMOR 20,...) for minimum 4 hours in the same room.
- During stabilisation period and calibration procedure it is important to keep the temperature constant in the reference climate chamber.
- For calibration the humidity sensor probe must be stabilised at least 20 minutes in the reference chamber.
- Replace a dirty filter cap before calibration!
- A reduction of the stabilisation time can be achieved by cleaning the probe with n-Hexan resp. n-Heptan. Sway the probe carefully in the solvent then drip off and after that exhaust the air around the probe >0.5h.
  Attention: Other solvents than above mentioned can corrode the humidity sensor!

7.1 2-point humidity calibration

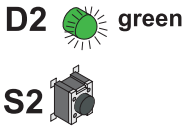
For accurate adjustment over the whole working range a two point calibration is recommended.

- Start calibration at the low humidity calibration point!
- The humidity difference between the two points should be > 30%RH
- Low humidity point < high humidity point
- 2-point calibration may be performed directly on the circuit board or using the configuration software supplied (for more details, see Configuration Software, chapter 5.4 ”Calibration”)

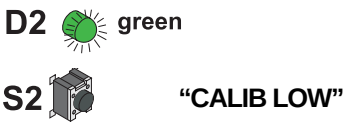
2-point humidity calibration procedure on the circuit board:

low calibration point:

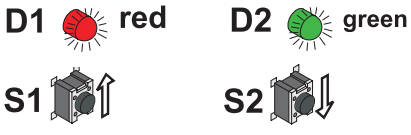
1. Insert the sensor probe into the reference humidity 1 (low calibration point) and stabilise for at least 20 minutes.



2. BUTTON S2: Pressing the button for 5 seconds starts the procedure for the calibration mode RH. The calibration mode is indicated by the lit LED "D2" on the circuit board.

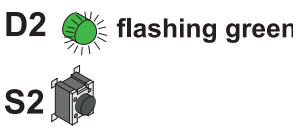


3. BUTTON S2: Pressing the button for 5 seconds starts the procedure for the low calibration point. The calibration mode is indicated by the lit LED "D2" and the symbol "CALIB LOW" will appear on the optional LC display.



4. BUTTON S1 (up) and **S2 (down)**: Pressing one of the two buttons will adjust the measuring value in steps of 0.1% up or down to the reference value. The actual measuring value is indicated on the display or can be measured with the analogue output. As soon as the measured value is changed, "D1" flashes resp. disappears when pressing alternating S1 resp. S2.

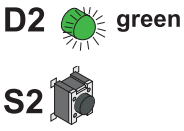
5. BUTTON S1 (store): Pressing the button for 5 seconds stores the calibration value and the procedure is ended. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB LOW" will disappear from the optional LC display.



BUTTON S2 (cancel): Pressing the button for 5 seconds the calibration procedure will be ended without storing the calibration values. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB LOW" will disappear from the optional LC display.

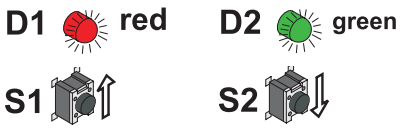
high calibration point:

6. Insert the sensor probe into the reference humidity 2 (high calibration point) and stabilise for at least 20 minutes.

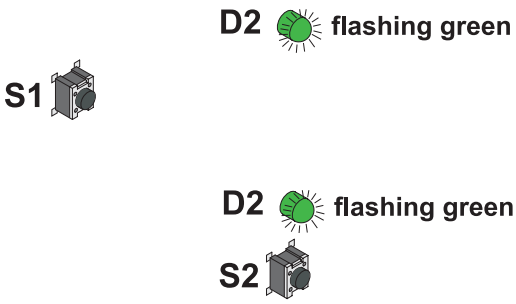


7. BUTTON S2: Pressing the button for 5 seconds starts the procedure for the calibration mode RH. The calibration mode is indicated by the lit LED "D2" on the circuit board.

8. BUTTON S1: Pressing the button for 5 seconds starts the procedure for the high calibration point. The calibration mode is indicated by the lit LED "D2" and the symbol "CALIB HIGH" will appear on the optional LC display.



9. BUTTON S1 (up) and **S2 (down)**: Pressing one of the two buttons will adjust the measuring value in steps of 0.1% up or down to the reference value. The actual measuring value is indicated on the display or can be measured with the analogue output. As soon as the measured value is changed, "D1" flashes resp. disappears when pressing alternating S1 resp. S2.



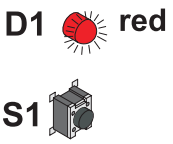
10. BUTTON S1 (store): Pressing the button for 5 seconds stores the calibration value and the procedure is ended. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB HIGH" will disappear from the optional LC display.
BUTTON S2 (cancel): Pressing the button for 5 seconds the calibration procedure will be ended without storing the calibration values. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB HIGH" will disappear from the optional LC display.

7.2 2-point temperature calibration

- Start calibration at the low calibration point!
- The temperature difference between the two points should be at least 30 degC (86°F)!
- Low temperature point < high temperature point
- Attention: A 2-point temperature calibration is not supported by the configuration software and must therefore be done directly on the circuit board!
  (see the following procedure)

2-point temperature calibration procedure on the circuit board:

low calibration point:



1. Insert the sensor probe into the reference temperature 1 (low calibration point) and stabilise for at least 20 minutes.

2. BUTTON S1: Pressing the button for 5 seconds starts the procedure for the calibration mode temperature. The calibration mode is indicated by the lit LED "D1" on the circuit board.

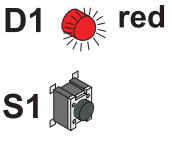
3. BUTTON S2: Pressing the button for 5 seconds starts the procedure for the low calibration point. The calibration mode is indicated by the symbol "CALIB LOW" on the optional LC display.

4. BUTTON S1 (up) and **S2 (down):** Pressing one of the two buttons will adjust the measuring value in steps of 0.1 degC up or down to the reference value. The actual measuring value is indicated on the display or can be measured with the analogue output. As soon as the measured value is changed, "D1" flashes resp. disappears when pressing alternating S1 resp. S2.

5. BUTTON S1 (store): Pressing the button for 5 seconds stores the calibration value and the procedure is ended. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB LOW" will disappear from the optional LC display.

BUTTON S2 (cancel): Pressing the button for 5 seconds the calibration procedure will be ended without storing the calibration values. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB LOW" will disappear from the optional LC display.

high calibration point:



6. Insert the sensor probe into the reference temperature 2 (high calibration point) and stabilise for at least 20 minutes.

7. BUTTON S1: Pressing the button for 5 seconds starts the procedure for the calibration mode temperature. The calibration mode is indicated by the lit LED "D1" on the circuit board.

8. BUTTON S1: Pressing the button for 5 seconds starts the procedure for the high calibration point. The calibration mode is indicated by the symbol "CALIB HIGH" on the optional LC display.

9. BUTTON S1 (up) and **S2 (down):** Pressing one of the two buttons will adjust the measuring value in steps of 0.1 degC up or down to the reference value. The actual measuring value is indicated on the display or can be measured with the analogue output. As soon as the measured value is changed, "D1" flashes resp. disappears when pressing alternating S1 resp. S2.

10. BUTTON S1 (store): Pressing the button for 5 seconds stores the calibration value and the procedure is ended. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB HIGH" will disappear from the optional LC display.

BUTTON S2 (cancel): Pressing the button for 5 seconds the calibration procedure will be ended without storing the calibration values. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB HIGH" will disappear from the optional LC display.

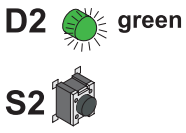
7.3 1-point humidity calibration

When the working range is limited to a certain more narrow range, a calibration at one humidity point is sufficient.

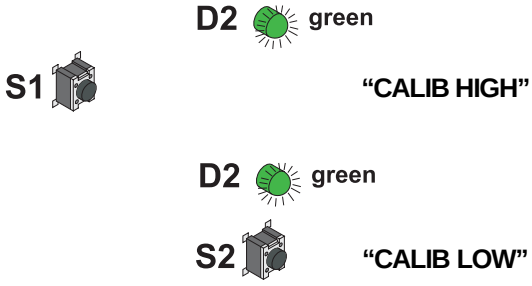
- In accordance with the working range, either the high or low calibration point should be selected. (CP > or < 50% RH)
- This calibration causes an extra inaccuracy for the rest of the working range.
- The 1-point humidity calibration may be done directly on the circuit board or using the configuration software supplied. (for more details, see the Configuration Software, chapter 5.4 “1-point humidity calibration”)

1-point humidity calibration procedure on the circuit board:

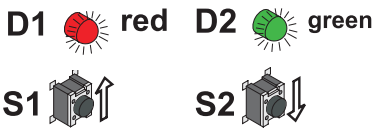
1. Insert the sensor probe into the reference humidity (calibration point) and stabilise for at least 20 minutes.



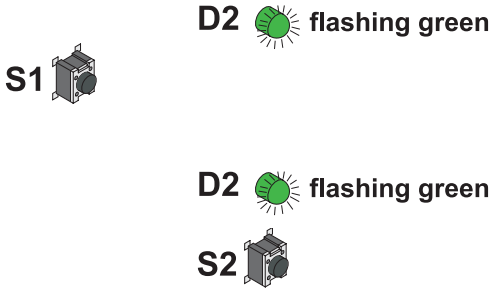
2. BUTTON S2: Pressing the button for 5 seconds starts the procedure for the calibration mode RH. The calibration mode is indicated by the lit LED "D2" on the circuit board.



3. BUTTON S1: Pressing the button for 5 seconds starts the procedure. The calibration mode is indicated by the lit LED "D2" and the symbol "CALIB HIGH" will appear on the optional LC display (CP ≥ 50% RH).
or
BUTTON S2: Pressing the button for 5 seconds starts the procedure. The calibration mode is indicated by the lit LED "D2" and the symbol "CALIB LOW" will appear on the optional LCD (CP < 50% RH).



4. BUTTON S1 (up) and **S2 (down)**: Pressing one of the two buttons will adjust the measuring value in steps of 0.1% up or down to the reference value. The actual measuring value is indicated on the display or can be measured with the analogue output.



5. BUTTON S1 (store): Pressing the button for 5 seconds stores the calibration value and the procedure is ended. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB LOW" or "CALIB HIGH" will disappear from the optional LC display.
BUTTON S2 (cancel): Pressing the button for 5 seconds the calibration procedure will be ended without storing the calibration values. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB LOW" or "CALIB HIGH" will disappear from the optional LC display.

7.4 1-point temperature calibration

When the working range is limited to a certain more narrow range, a calibration at one temperature point is sufficient.

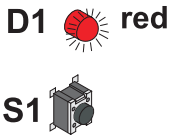
- In accordance with the working range, either the high or low calibration point should be selected. (CP ≥ or < 45 degC / 113°F)

- This calibration causes an extra inaccuracy for the rest of the working range.

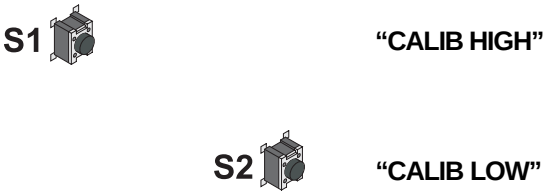
- The 1-point temperature calibration may be performed directly on the circuit board or using the configuration software supplied. (for more details, see Configuration Software, chapter 5.4 “1-point temperature calibration”)

1-point temperature calibration procedure on the circuit board:

1. Insert the sensor probe into the reference temperature (calibration point) and stabilise for at least 20 minutes.



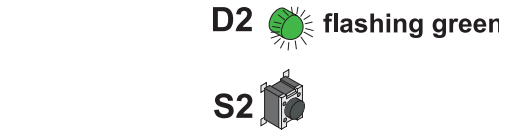
2. BUTTON S1: Pressing the button for 5 seconds starts the procedure for the calibration mode temperature. The calibration mode is indicated by the lit LED "D1" on the circuit board



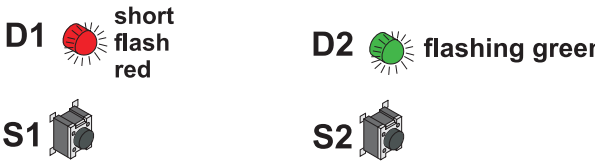
3. BUTTON S1: Pressing the button for 5 seconds starts the procedure. The calibration mode is indicated by the symbol "CALIB HIGH" on the optional LC display (CP ≥ 45 degC / 113°F).
or
BUTTON S2: Pressing the button for 5 seconds starts the procedure. The calibration mode is indicated by the symbol "CALIB LOW" on the optional LC display (CP < 45 degC / 113°F).

4. BUTTON S1 (up) and **S2 (down)**: Pressing one of the two buttons will adjust the measuring value in steps of 0.1 degC up or down to the reference value. The actual measuring value is indicated on the display or can be measured with the analogue output.

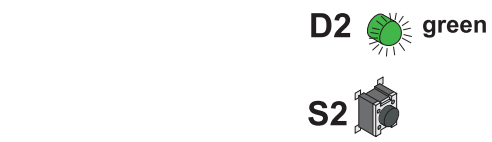
5. BUTTON S1 (store): Pressing the button for 5 seconds stores the calibration value and the procedure is ended. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB LOW" or "CALIB HIGH" will disappear from the optional LC display.
BUTTON S2 (cancel): Pressing the button for 5 seconds the calibration procedure will be ended without storing the calibration values. LED "D2" flashes to indicate exiting of the calibration mode and the symbol "CALIB LOW" or "CALIB HIGH" will disappear from the optional LC display.



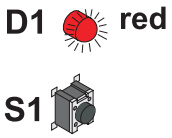
7.5 Resetting the customer calibration to the factory calibration on the circuit board:



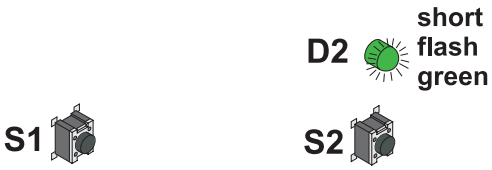
1. <u>RH + T RESET:</u> BUTTON S1 and S2: In neutral mode pressing buttons S1 and S2 simultaneously for 10 seconds customer <u>calibration settings are reset to factory calibration</u>.
A short flash of the LED "D1" indicates the reset.
or



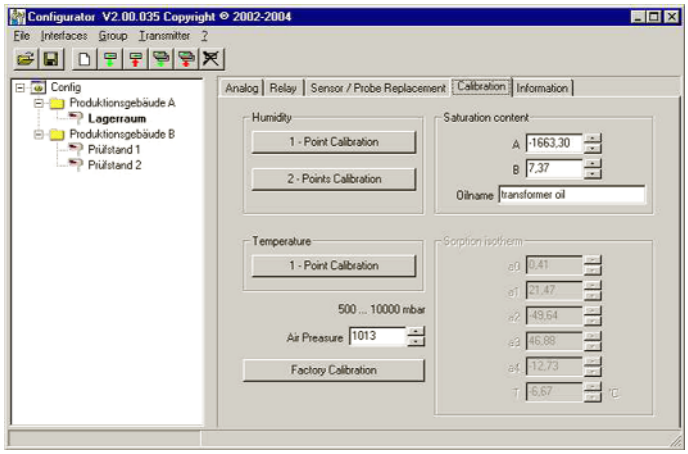
2. <u>RH RESET:</u> BUTTON S2: Pressing the button for 5 seconds starts the <u>procedure for the calibration mode RH. Pressing buttons S1 and S2 simultanously for 10 seconds customer calibration settings are reset to factory calibration</u>.
A short flash of the LED "D1" indicates the reset.
or



3. <u>Temp. RESET:</u> BUTTON S1: Pressing the button for 5 seconds starts the <u>procedure for the calibration mode T. Pressing buttons S1 and S2 simultanously for 10 seconds customer calibration settings are reset to factory calibration</u>.
A short flash of the LED "D2" indicates the reset.



5.4 Calibration



Saturation content:
Enter the parameter A and B for calculation of the water content x [ppm].

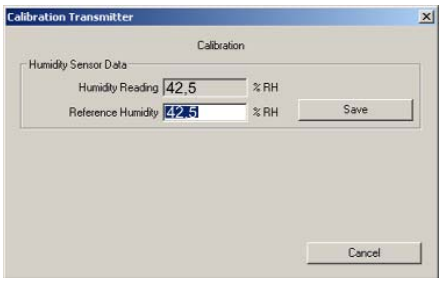
In addition to the manual calibration procedure on the circuit board (see Hardware, chapter 7. “Humidity/Temperature Calibration”), new calibrations can be performed using the EE36 software.

Note: A 2-point calibration for temperature is only possible on the circuit board and is not supported by the software.

Note: A reduction of the stabilisation time can be achieved by cleaning the probe with n-Hexan resp. n-Heptan. Sway the probe carefully in the solvent then drip off and after that exhaust the air around the probe >0.5h.
Attention: Other solvents than above mentioned can corrode the humidity sensor!

1-point calibration **Humidity**: Fast and easy calibration for accurate measurement results at a defined working point (humidity point).

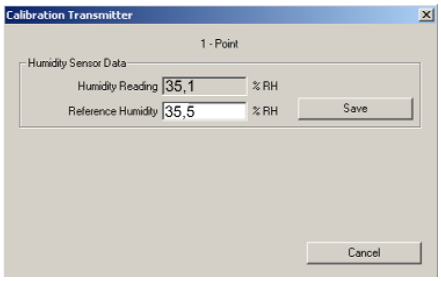
For calibration procedure see Hardware, chapter 7. “Humidity/Temperature Calibration”



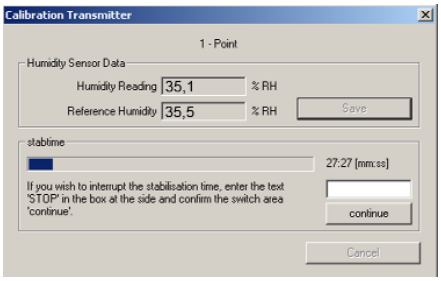
1) Stabilise the probe of the desired humidity for min. 30 minutes.
2) Click on the Humidity "1-point calibration" button. The measured values will now appear in both input fields.
3) Replace the value in the input field "Humidity Reading" with the reference humidity (value of the saline solution or display of HUMOR 20).
4) By clicking on "Save", the humidity reading for the transmitter will be adjusted to the reference humidity.

2-point calibration **Humidity**: Calibration for accurate results over the entire measurement range.

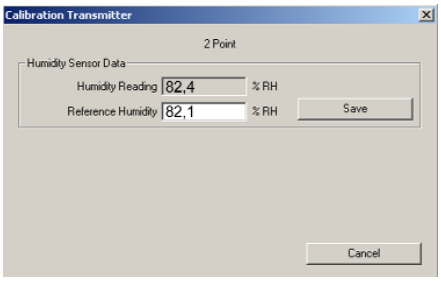
For calibration procedure, see Hardware, chapter 7. “Humidity/Temperature Calibration”.



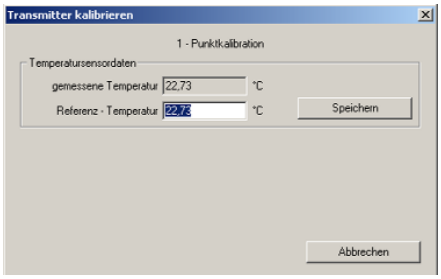
1) Place the probe at the reference humidity (lower point).
2) Click on the Humidity 2-Point Calibration button.
   (In a separate window, the measured values will appear in both input fields)
3) Replace the value in the input field "Humidity Reading" with the reference humidity. (Value of the saline solution or display of HUMOR 20)
4) By clicking on "Save", the humidity reading of the transmitter will be adjusted to the reference humidity. Now the 30-minute stabilisation period starts.



5) Place the probe at the reference humidity (high point).
6) Before continuing wait till the 30-minute stabilisation period is over.
7) Replace the value in the input field "Humidity Reading" with the reference humidity. (Value of the saline solution or display of HUMOR 20)
8) By clicking on "Save", the humidity reading of the transmitter will be adjusted to the reference humidity.
9) The process is complete when the message "Two-point calibration successful" appears.



1-point calibration **Temperature**: If the working range is limited to a narrow temperature range, one-point calibration will be sufficient within this working range.



1) Place the probe at the reference temperature and allow stabilisation for approx. 30 minutes.
2) Click on the Temperature 1-Point Calibration button.
   The measured value will appear in both input fields. (see additional window)
3) Replace the value in the input field "Temperature Reading" with the reference temperature.
4) By clicking on "Save", the temperature reading of the transmitter will be adjusted to the reference temperature.
5) The process is complete when the message "Calibration Successful" appears.