

# CALIBRATION OF HYGROMETERS

with non-saturated salt solutions

## GENERAL INFORMATION

- Specimen:** The device under test. The measuring device which undergoes calibration or adjustment.
- Reference or Standard:** The device which supplies the “true” value in the calibration or adjustment process. The reference should be traceable to national or international standards. Traceability is guaranteed via a calibration hierarchy. The humidity reference value can be supplied for instance by a non-saturated salt solution or by an humidity generator.
- Calibration:** Comparison of the specimen with the reference and statement on the deviation in form of a calibration certificate. The specimen is not modified/adjusted during the calibration.
- Adjustment:** Modification of the specimen for bringing it in line with the reference.

The Humor 20 Humidity Calibrator generates the humidity reference value on a two-pressure reactor principle. It is highly accurate, very fast, independent from the ambient temperature and can run automatically multiple point humidity calibrations. Humor 20 is appropriate for high end calibration and adjustment of hygrometers with sensing probes Ø 8 – 30 mm (0.31 – 1.18 inch), compact room transmitters and data loggers. For humidity calibration with Humor 20 see:

- data sheet at [http://www.epluse.com/fileadmin/data/product/humor20/datasheet\\_Humor20.pdf](http://www.epluse.com/fileadmin/data/product/humor20/datasheet_Humor20.pdf)
- manual at [http://www.epluse.com/fileadmin/data/product/humor20/BA\\_Humor20\\_e.pdf](http://www.epluse.com/fileadmin/data/product/humor20/BA_Humor20_e.pdf)

The Humidity Calibration Kit with salt solutions offers an easy, cost efficient way of calibrating and adjusting hygrometers with sensing probes Ø 10 – 12 mm (0.39 – 0.47 inch).

The E+E saturated salt solutions come with an traceable calibration certificate and allow for high calibration accuracy. Data sheet: [http://www.epluse.com/fileadmin/data/product/HumidityCalibrationSet/datasheet\\_humidity\\_calib\\_set\\_e.pdf](http://www.epluse.com/fileadmin/data/product/HumidityCalibrationSet/datasheet_humidity_calib_set_e.pdf)

## PREPARATIONS

### for calibration with non-saturated salt solutions

- The probe of the specimen as well as the calibration chamber must be clean and dry. For cleaning a dirty probe please see “Cleaning Instructions for Humidity Sensors” at [http://www.epluse.com/fileadmin/data/product/CleaningInstructions/BA\\_CleaningInstructions\\_e.pdf](http://www.epluse.com/fileadmin/data/product/CleaningInstructions/BA_CleaningInstructions_e.pdf)
- A clogged or dirty filter cap must be replaced by an original new one before calibration. For the choice of filter caps see data sheet “Accessories” at [http://www.epluse.com/fileadmin/data/product/accessories/datasheet\\_accessories.pdf](http://www.epluse.com/fileadmin/data/product/accessories/datasheet_accessories.pdf)
- For accurate calibration is of utmost importance that the probe to be calibrated, the calibration chamber and the salt solution are at the same temperature (calibration temperature), which shall remain constant during the entire calibration process.
- For best accuracy the calibration temperature shall be 23 °C ±2 °C (73.4 °F ±3.6 °F). Ideally, the calibration should take place in a temperature controlled environment with no draught and no direct sun radiation.

Temperature (°C)	Relative Humidity (%)
15°C	49.4%RH
18°C	49.6%RH
20°C	49.7%RH
21°C	49.8%RH
22°C	49.9%RH
24°C	50.0%RH
25°C	50.1%RH
26°C	50.2%RH
28°C	50.3%RH
30°C	50.4%RH

- Information on the reference humidity value supplied by an E+E saturated salt solution at various temperatures is available with each set of ampoules on the sticker inside in the box.
- Do not hold the calibration chamber with the hand during the calibration. This would lead to temperature variations and to wrong calibration results.



During the entire calibration process the calibration chamber shall stay in a stable, horizontal position. The salt solution shall not come in contact with the sensing head (tip of the probe) of the specimen.

- Test first the stability of the set-up with the probe to be calibrated inserted into the calibration chamber. In some cases it might not suffice to just lay the chamber on a table. A stable set-up might require mechanical fixture for the calibration chamber, for the probe or for both, as in the case of heavy, long probes or wall mounted / duct mounted hygrometers with bulky enclosures.

## HANDLING

1. Place / fix the calibration chamber in horizontal position. Remove the cover and place a textile pad on the bottom of the calibration chamber.



2. Choose an ampoule with desired reference humidity, for instance 35 % RH (HA010435) and gently shake and tap the glass to bring the fluid to the bottom part of the ampoule.



3. Press back the tip of the ampoule at the mark to break it open. Empty the content of the ampoule on the textile pad while tapping it lightly.



4. Insert the probe into the calibration chamber till it reaches the opposite side. The sensing head (tip of the probe) shall not come in contact with the salt solution.



Do not remove the filter cap.



5. Place the cover onto the calibration chamber and close it tightly. The hygrometer is now ready for calibration or adjustment.



For both calibration and adjustment we recommend following stabilization times:

- 45 min. for 0, 5, 10, 20, 35, 50, 65 % RH.
- 60 min. for 80 % RH
- 120 min. for 95 % RH

For adjustment please see instructions in the operation manual of the specimen.

Dispose of the textile pad after each calibration point, rinse the calibration chamber with tap water and wipe it completely dry with a soft cloth.

For multiple point humidity calibration we recommend to run a full calibration loop starting at low humidity, for instance 10 % → 35 % → 50 % → 80 % → 50 % → 35 % → 10 %.

## SAFETY INSTRUCTIONS

The safety data sheet for the none-saturated salt solutions is available upon request.

## INFORMATION

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