

HD75, HD33, HD11



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RH CALIBRATION - SALT SATURATED SOLUTION

For checking, setting up or calibrating instruments with relative humidity sensors

Before starting

- Make sure that inside the chamber containing the saturated salt solutions there are at the same time:
 - solid salt
 - liquid solution or wet salt
- The instrument and the saturated solutions to be used are to be kept in an environment at stable temperature while checking or calibrating them.
- Wait for at least a couple of hours at stable temperature so that the instrument and the salt solutions reach thermal equilibrium with the environment.
- Unscrew the cap of the first saturated salt solution to be used for checking or calibrating the instrument. Use:
 - for probes with thread M24X1,5, the bottle threaded hole M24X1,5 directly;
 - for probes with thread M12X1, the supplied adapter M24X1,5 / M12X1.
- If there is any liquid inside the measurement chamber, dry it with clean absorbent paper. The uncertainty of the solution or measurement is not influenced by any liquid left inside the measurement chamber.
- Screw the probe to the bottom of the thread; do not touch the sensitive element with your hands or any other object or liquid.
- The temperature of the salt solution and that of the sensor must be the same or very close. Once the sensor is inserted, wait for at least 30 minutes.
- Connect the probe to the instrument or transmitter. Power or turn them on as per instructions.
- After 30 minutes, start the calibration procedure for the first calibration point according to the instruction manual of the specific instrument.
- Once you have checked, set up or calibrated the first point, take the probe out of the bottle and put the cap back on the bottle. Make sure you do not mix it up with that of other saturated solutions.
- Repeat points 1, 2, 3 and 4 to perform the second calibration point with the second saturated solution.

Notes and warnings:

- Keep salt solutions in the dark at a temperature of about 20°C.
- Salt solutions are effective and can be used as long as there is salt to be melted as well as liquid inside them. As a rule, in 33% RH solution make sure that there is some solid salt left, while in 75%RH solution make sure that there is some liquid left or salt is wet.
- For better results, the temperature of the probe and that of the saturated solution must be as close as possible. Do not forget that plastic materials are bad conductors of heat. Any difference of tenths of degree between the sensor and the saturated salt solution leads to errors of RH points.
- Do not touch the sensitive element with your hands or other objects. Scratches and dirt alter the instrument measurement and may damage the sensor.
- The measurement chamber must be closed, otherwise the equilibrium cannot be reached.
Thoroughly screw the probe to the bottle.
- The check or calibration sequence for Delta OHM instruments or transmitters is always as follows:
first solution: 75% RH
second solution: 33%RH
third solution: 11% RH (if any)
No sequence is compulsory for checking the sensor.
- To calibrate or set up the instrument, follow the instruction manual of the instrument that you are using.
- If you check, set up or calibrate the instrument at a temperature of other than 20°C, see the following table to find out the equilibrium relative humidity reference value of the salt solution corresponding to the working temperature. In this table, you will find the saturated salt relative humidity variation when temperature changes.

Equilibrium relative humidity of selected saturated salt solutions from 0 to 100°C			
Temp. °C	Lithium Chloride	Magnesium Chloride	Sodium Chloride
0	11.23 ± 0.54	33.66 ± 0.33	75.51 ± 0.34
5	11.26 ± 0.47	33.60 ± 0.28	75.65 ± 0.27
10	11.29 ± 0.41	33.47 ± 0.24	75.67 ± 0.22
15	11.30 ± 0.35	33.30 ± 0.21	75.61 ± 0.18
20	11.31 ± 0.31	33.07 ± 0.18	75.47 ± 0.14
25	11.30 ± 0.27	32.78 ± 0.16	75.29 ± 0.12
30	11.28 ± 0.24	32.44 ± 0.14	75.09 ± 0.11
35	11.25 ± 0.22	32.05 ± 0.13	74.87 ± 0.12
40	11.21 ± 0.21	31.60 ± 0.13	74.68 ± 0.13
45	11.16 ± 0.21	31.10 ± 0.13	74.52 ± 0.16
50	11.10 ± 0.22	30.54 ± 0.14	74.43 ± 0.19
55	11.03 ± 0.23	29.93 ± 0.16	74.41 ± 0.24
60	10.95 ± 0.26	29.26 ± 0.18	74.50 ± 0.30
65	10.86 ± 0.29	28.54 ± 0.21	74.71 ± 0.37
70	10.75 ± 0.33	27.77 ± 0.25	75.06 ± 0.45
75	10.64 ± 0.38	26.94 ± 0.29	75.58 ± 0.55
80	10.51 ± 0.44	26.05 ± 0.34	76.29 ± 0.65
85	10.38 ± 0.51	25.11 ± 0.39	
90	10.23 ± 0.59	24.12 ± 0.46	
95	10.07 ± 0.67	23.07 ± 0.52	
100	9.90 ± 0.77	21.97 ± 0.60	

