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Calibrating Vaisala HMP45

USDA¹¹USDA

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Works for me

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PDI Test



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ABSTRACT

Calibrating Vaisala HMP45

PROTOCOL CITATION

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KEYWORDS

Calibrating, calibration, Vaisala, HMP45

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1 Clean the sensor



Remove the cap and filter. The filter is like Teflon tape, very fragile. Use DI water and a Q-tip to remove dirt/dust. The filter can usually be unscrewed from inside the cap, if it will not turn while using your finger, then a screwdriver to push it out from the top is a last resort. There is a possibility of damaging the filter and filter frame.



This is a good time to re-tin the connecting wires. Makes install much easier.

After the cap and filter have dried, re-assemble the HMP.

Remove the rubber covering for the "W, D, T" potentiometer screws.



Have a close look at the screw orientation. Use the smallest CSI flat screwdriver or the special Vaisala tool (if you can find one). These screws are sometimes tough to engage. They are also very sensitive, just slightly pushing on the screw will change the output values. I've sometimes had to observe how much change was imparted by my screwdriver pressure and then set to slightly off of 60%, then release the potentiometer and see if it sets on 60% or just off and repeat.

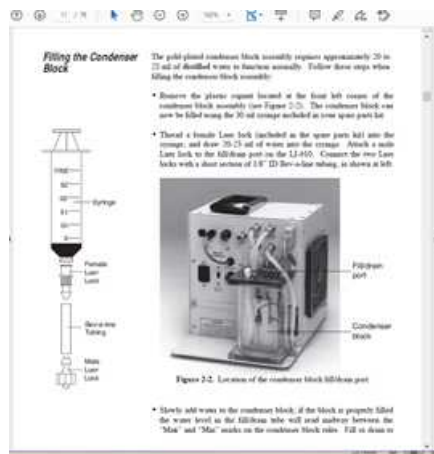
- 2 Setup your chamber, LI610, logger, HMP and thermistors. Connect everything, start prog and Li610. Check the logger to verify the chamber temp and thermistors are working. Insert the HMP into the chamber so that you can access the calibration potentiometers easily. You will be changing the "Dry" and "Temp."

Fill top of radiator with DI water.



Figure 2-8. LI-610 top view, showing location of radiator fill.

Fill the condenser following the instructions in the manual (use DI water only).



Connect the LI610 to the chamber "Output 1". Use the shortest amount of tubing you can. A longer length will allow the air to change by the time it reaches the chamber.

- 3 Calibration time. Using the following table (Li610_Cal on the s:drive and hard copy in the black book), set the LI-610 to output 60% RH based on the chamber temp reported by the thermistors. If chamber temp is 21, then Li-610 set temp for 60% RH would be 12.94.

Chamber	Ex at Chamber Temp	LE-95 Setpoint 80%	LE-95 Setpoint 90%	LE-95 60% (RA)	90% 804 (RA)	90% 804 (RA)
20	2.547	12.004	18.736	4.408	2.152	
20.1	2.581	12.008	18.848	4.417	2.126	
20.2	2.576	12.012	18.877	4.428	2.158	
20.3	2.591	12.080	18.966	4.434	2.012	
20.4	2.480	12.548	19.746	4.432	2.044	
20.5	2.428	12.474	19.653	4.442	2.178	
20.6	2.416	12.500	19.682	4.451	2.205	
20.7	2.481	12.862	19.901	4.479	2.207	
20.8	2.408	13.735	19.898	4.479	2.219	
20.9	2.487	12.648	19.898	4.486	2.213	
21	2.496	12.563	19.707	4.498	2.244	
21.1	2.517	13.037	19.706	4.487	2.265	
21.2	2.507	13.013	19.694	4.516	2.244	
21.3	2.442	12.922	19.811	4.503	2.248	
21.4	2.404	13.779	19.693	4.536	2.303	
21.5	2.514	13.413	19.795	4.544	2.376	
21.6	2.488	13.887	19.889	4.584	2.331	
21.7	2.466	13.681	19.888	4.563	2.343	
21.8	2.471	13.446	19.889	4.573	2.319	
21.9	2.477	13.708	20.009	4.582	2.374	
22	2.494	13.883	20.286	4.593	2.402	
22.1	2.474	13.877	20.383	4.602	2.401	
22.2	2.488	13.901	20.487	4.612	2.417	
22.3	2.502	14.184	20.688	4.621	2.433	
22.4	2.579	14.268	20.679	4.621	2.437	
22.5	2.578	14.502	20.777	4.643	2.443	
22.6	2.592	14.448	20.916	4.651	2.477	
22.7	2.590	14.649	20.915	4.661	2.482	
22.8	2.596	14.634	21.073	4.673	2.527	
22.9	2.581	14.718	21.172	4.682	2.523	
23	2.533	14.832	21.271	4.692	2.538	
23.1	2.637	14.916	21.366	4.703	2.523	
23.2	2.684	15.978	21.465	4.712	2.489	
23.3	2.617	15.104	21.687	4.723	2.584	
23.4	2.589	15.111	21.688	4.733	2.649	
23.5	2.566	15.291	21.784	4.746	2.616	
23.6	2.564	15.380	21.881	4.754	2.611	
23.7	2.591	15.479	21.983	4.765	2.647	
23.8	2.586	15.573	22.080	4.776	2.683	
23.9	2.617	15.687	22.177	4.784	2.678	
24	2.596	15.781	22.283	4.787	2.691	

When the sensor RH levels out and the chamber reaches equilibrium, record the values on the calibration worksheet:

The screenshot shows the Microsoft Excel 2010 interface. The title bar at the top reads "Microsoft Excel - [Book1.xlsx]". The ribbon menu is visible, showing the "File" tab selected. The ribbon includes the following tabs: File, Home, Insert, Page Layout, Formulas, Data, Review, View, Help, Window, and Quick Start. The "Home" tab is active, displaying options for Font, Paragraph, Styles, and Editing. The spreadsheet area is mostly blank, with a few cells containing text: "Date" in cell B1, "10/15/10" in cell C1, "10/15/10" in cell D1, "10/15/10" in cell E1, "10/15/10" in cell F1, "10/15/10" in cell G1, "10/15/10" in cell H1, "10/15/10" in cell I1, and "10/15/10" in cell J1. The status bar at the bottom indicates "1 sheet 1 item selected 21/10/2010".

Date
SN (factory Vaisala SN)
NSTL SN (sometimes written in marker, "NSTL 01" or "2010-01")
Chamber Temp (Thermistor avg temp)
Li-610 Set Temp 60% RH
21X 60% RH (what is the sensor reading before changing potentiometer)

Now go ahead and change the "Temp" potentiometer to match the average of the thermistors.
Record the new value under "Vaisala Temp"

Next change the "Dry" potentiometer to match the 60% RH in the chamber.
Record the value you were able to set to under the "Adjusted to 60% RH" column. Most of the time it is 59.99 to 60.01.

Now we want to test what it will read at 90% RH. Find the LI-610 setpoint for 90% RH and adjust the Dewpoint Generator. It will take a few minutes to equilibrate. When the sensor reaches a plateau, record the value under "21X 90% RH"

Finish by adding your initials.