

**Certificate #:** 010213-B-C4650041  
**Calibration Date:** January 2, 2013  
**Type:** Vaisala Humidity & Temperature Probe  
**Model #:** HMP45A  
**Serial #:** C4650041  
**SR #:** 117156

**Customer:** US Dept Of Commerce NOAA  
North Kingstown, RI

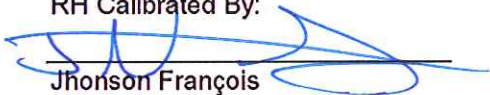
**Condition:** The instrument was operational upon receipt. The 'As Found' RH readings were out of tolerance. The RH sensor was contaminated.

**Action Taken:** The RH sensor was replaced and the instrument was adjusted and calibrated.

**Due Date: \*** January 2, 2014

RH Calibrated By:

Approved By:

  
Jhonson François  
Calibration Technician

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The measurement results on the certificate are traceable to national or international standards. The results of this calibration relate only to the items being calibrated. This certificate may not be reproduced, except in full, without the prior written approval of the issuing laboratory. Vaisala is ISO 9001:2008 certified. Vaisala's calibration system complies with the requirements of ANSI/NCSL Z540-1-1994.

The calibration laboratory is controlled at 23 °C ± 3 °C and 40 %RH ± 20 %RH.

**Special Limitations:** None.

\*Any due date given is based on a customer provided calibration interval. A number of factors may cause drift prior to the due date. Monitor all devices and calibrate when measurement error is suspected.

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### Relative Humidity Calibration

**Procedure #:** 11603100  
**Instrument Range:** 0.8 to 100 %RH  
**Lab Environment:** Relative Humidity 45.8 %RH, Temperature 22.5 °C

#### As Found Data

Out Of Tolerance As Received: YES

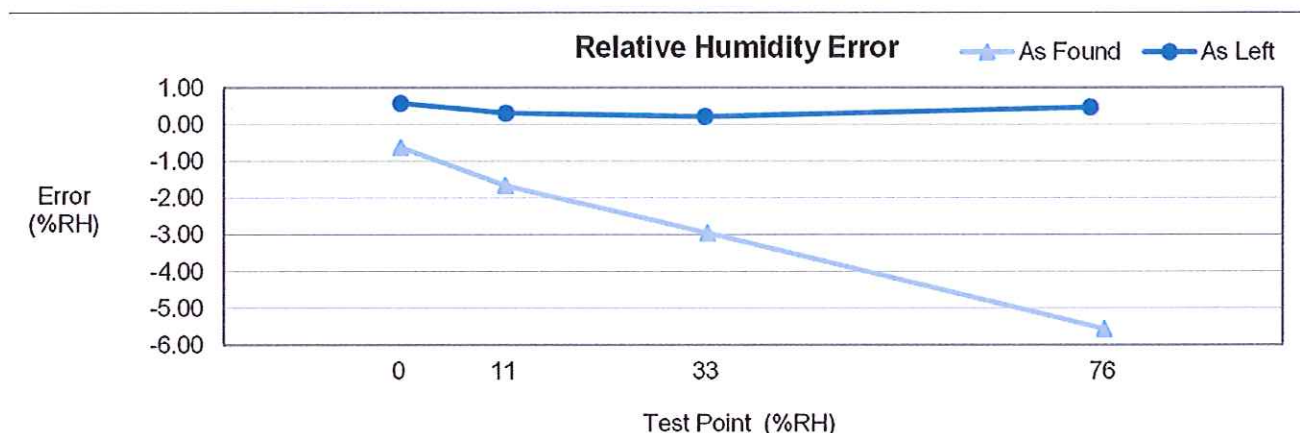
Relative Humidity, %RH				
Reference	Unit Under Test	Error	± Tolerance	± Uncertainty
0.03	-0.60	-0.63	1.00	0.50
11.27	9.60	-1.67	1.00	0.92
33.06	30.10	-2.96	1.00	1.01
75.77	70.20	-5.57	1.00	1.02
Temperature, °C				
Reference	Unit Under Test	Error	± Tolerance	± Uncertainty
20.55	20.50	-0.05	0.20	0.12

#### As Left Data

Relative Humidity, %RH				
Reference	Unit Under Test	Error	± Tolerance	± Uncertainty
0.03	0.60	0.57	1.00	0.50
11.30	11.60	0.30	1.00	0.92
32.79	33.00	0.21	1.00	1.01
74.24	74.70	0.46	1.00	1.02
Temperature, °C				
Reference	Unit Under Test	Error	± Tolerance	± Uncertainty
20.99	21.00	0.01	0.20	0.12

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## Relative Humidity Calibration



Reference Standards Calibration Information: Station 3A				
Model	Serial Number	Asset Number	Calibration Date	Due Date
Vaisala DMP248	Z3230008	3011-0341	Feb. 06, 2012	Feb. 06, 2013
Fluke 45	7781003	3011-0264	Aug. 15, 2012	Aug. 15, 2014
Vaisala HMK13B	P394	3011-0113	Sep. 15, 2012	Sep. 15, 2014
Vaisala HMT333	E0230023	3011-0323	Dec. 14, 2012	Feb. 06, 2013
Vaisala HMT333	E0230024	3011-0324	Dec. 14, 2012	Feb. 06, 2013



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**Description**

The calibration was performed in the Standard Laboratory of Vaisala, Inc. The instrument was first allowed to equilibrate to the laboratory environmental conditions for a period of at least 8 hours.

Relative Humidity Calibration: The sensor of the instrument was placed inside a Vaisala HMK13B calibrator along with two Vaisala HMT333 probes. Each reference value is the average of the two HMT333 readings. The instrument was allowed to stabilize inside the chamber for at least 30 minutes at each testpoint. A dry air line monitored by a Vaisala DMP248 was used to test 0 %RH.

**References**

The chambers of the Vaisala HMK13B generate RH testpoints in the air above saturated salt solutions. The Vaisala HMT333 measures RH using a capacitive polymer sensor and temperature using an RTD.

The Vaisala DMP248 measures dewpoint using a capacitive polymer sensor and temperature using an RTD. It calculates RH from the dewpoint and temperature readings.

**In or Out of Tolerance Decision Rule**

Out of tolerance conditions are determined by the product specification only. The calibration uncertainty is not tied in with the instrument's accuracy.

**Uncertainty**

The reported expanded uncertainty of the measurement is stated as the standard uncertainty of the measurement multiplied by the coverage factor of  $k=2$ , which corresponds to a coverage probability of approximately 95%. The standard uncertainty of the measurement has been determined in accordance with the ISO Guide to the Expression of Uncertainty in Measurement.