VAISALA Certificate of Calibration

Certificate #:	052313-B-F3510102
Calibration Date:	May 23, 2013
Type:	Vaisala Humidity & Temperature Transmitter
Model #:	HMT335
Serial #:	F3510102
SR #:	142249

Customer: University of Hawaii
Honolulu, HI

Condition: The instrument was operational upon receipt. The 'As Found' RH readings were out of tolerance. There was no RH sensor damage or contamination found.

Action Taken: The instrument was adjusted and calibrated.

Analog Outputs:

CH1:	0...5 V	-40...180 °C, T
CH2:	0...5 V	0...100 %RH

Due Date: * May 23, 2014

RH Calibrated By:

Matthew Nocivelli
Calibration Technician

Approved By:

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 22 °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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Certificate #: 052313-B-F3510102
Calibration Date: May 23, 2013
Type: Vaisala Humidity & Temperature Transmitter
Model #: HMT335
Serial #: F3510102
SR #: 142249

Relative Humidity Calibration

Procedure #: 11603100
Instrument Range: 0 to 100 %RH
Lab Environment: Relative Humidity 51.0 %RH, Temperature 21.8 °C

As Found Data

Out Of Tolerance As Received: YES

Relative Humidity, %RH				
Reference	**Unit Under Test**	**Error**	**± Tolerance**	**± Uncertainty**
0.03	0.10	0.07	1.00	0.50
11.45	12.70	1.25	1.00	0.92
33.05	35.00	1.95	1.00	1.01
76.01	75.40	-0.61	1.00	1.02
96.69	95.40	-1.29	1.70	1.50
Temperature, °C				
Reference	**Unit Under Test**	**Error**	**± Tolerance**	**± Uncertainty**
20.99	21.00	0.01	0.20	0.12

As Left Data

Relative Humidity, %RH				
Reference	**Unit Under Test**	**Error**	**± Tolerance**	**± Uncertainty**
0.03	0.00	-0.03	1.00	0.50
11.44	11.50	0.06	1.00	0.92
32.94	33.57	0.63	1.00	1.01
75.63	75.70	0.07	1.00	1.02
96.98	96.62	-0.36	1.70	1.50
Temperature, °C				
Reference	**Unit Under Test**	**Error**	**± Tolerance**	**± Uncertainty**
21.47	21.50	0.03	0.20	0.12

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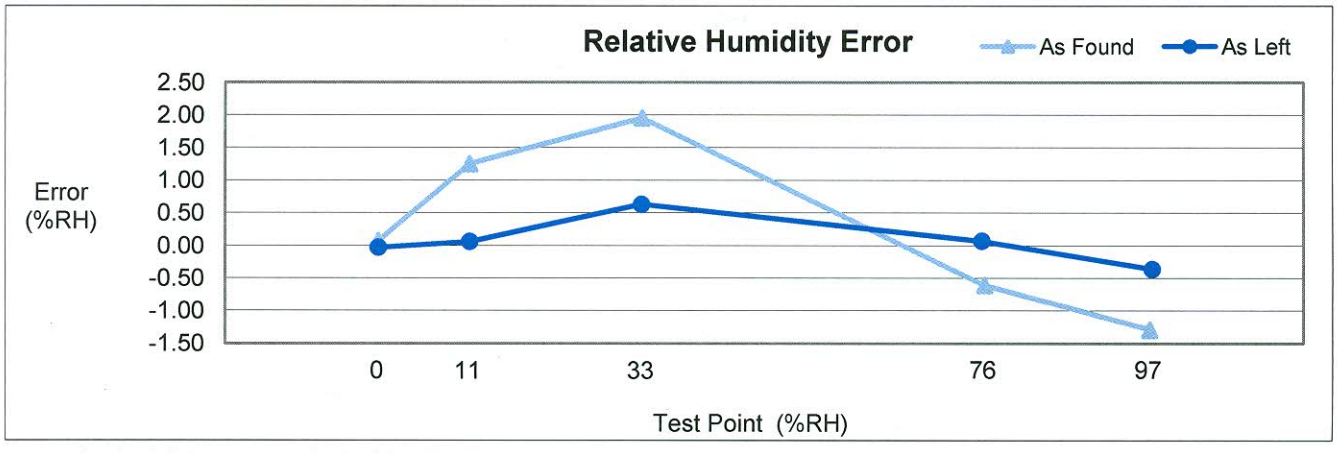
Relative Humidity Calibration



Reference Standards Calibration Information: Station 4B				
Model	**Serial Number**	**Asset Number**	**Calibration Date**	**Due Date**
Vaisala DMP248	Z3230008	3011-0341	Feb. 20, 2013	Feb. 20, 2014
Fluke 45	7517016	1011-0249	Jan. 09, 2013	Jan. 09, 2015
Vaisala HMK13B	S3650001	3011-0209	N/A	N/A
Vaisala HMT333	E4320003	3011-0346	Feb. 28, 2013	May. 28, 2013
Vaisala HMT333	E4410001	3011-0347	Feb. 28, 2013	May. 28, 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.

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