

**Certificate #:** 2022065-150520-PTU307-J1620011  
**Calibration Date:** May 20, 2015  
**Type:** Vaisala Pressure, RH & Temp. Transmitter  
**Model #:** PTU307  
**Serial #:** J1620011  
**SR #:** 321203

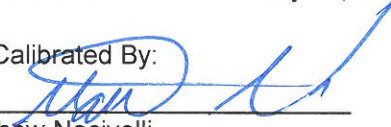
**Customer:** University of Alaska  
201 Railway Ave  
R/V SIKULIAQ  
Seward, AK 99664

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

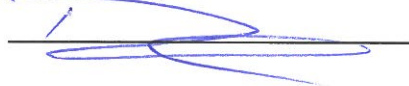
**Action Taken:** Replaced the dirty filter. The "SWARM" function was disabled. The purge function was enabled per customer. The instrument was adjusted and calibrated.

**Due Date: \*** May 20, 2016

RH Calibrated By:

  
Matthew Nocivelli  
Calibration Technician

Approved By:



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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 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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## Relative Humidity Calibration

**Procedure #:** PI213878 Rev. I  
**Instrument Range:** 0 to 100 %RH  
**Lab Environment:** Relative Humidity 49.6 %RH, Temperature 21.9 °C

### As Found Data

Out Of Tolerance As Received: YES

| Relative Humidity, %RH |                 |       |             |               |
|------------------------|-----------------|-------|-------------|---------------|
| Reference              | Unit Under Test | Error | ± Tolerance | ± Uncertainty |
| 0.03                   | 1.40            | 1.37  | 1.00        | 0.50          |
| 11.55                  | 12.80           | 1.25  | 1.00        | 0.42          |
| 33.10                  | 34.30           | 1.20  | 1.00        | 0.60          |
| 75.09                  | 77.20           | 2.11  | 1.00        | 0.79          |

| Temperature, °C |                 |       |             |               |
|-----------------|-----------------|-------|-------------|---------------|
| Reference       | Unit Under Test | Error | ± Tolerance | ± Uncertainty |
| 22.54           | 22.60           | 0.06  | 0.21        | 0.13          |

### After Chemical Purge

| Relative Humidity, %RH |                 |       |             |               |
|------------------------|-----------------|-------|-------------|---------------|
| Reference              | Unit Under Test | Error | ± Tolerance | ± Uncertainty |
| 75.10                  | 76.20           | 1.10  | 1.00        | 0.79          |

### As Left Data

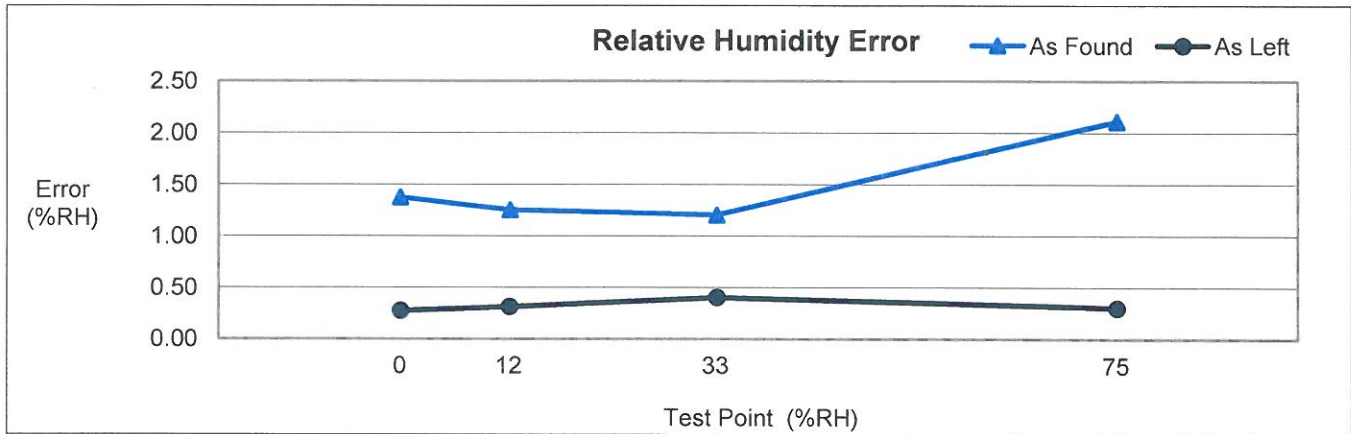
| Relative Humidity, %RH |                 |       |             |               |
|------------------------|-----------------|-------|-------------|---------------|
| Reference              | Unit Under Test | Error | ± Tolerance | ± Uncertainty |
| 0.03                   | 0.30            | 0.27  | 1.00        | 0.50          |
| 11.49                  | 11.80           | 0.31  | 1.00        | 0.42          |
| 33.10                  | 33.50           | 0.40  | 1.00        | 0.60          |
| 75.10                  | 75.40           | 0.30  | 1.00        | 0.79          |

| Temperature, °C |                 |       |             |               |
|-----------------|-----------------|-------|-------------|---------------|
| Reference       | Unit Under Test | Error | ± Tolerance | ± Uncertainty |
| 22.04           | 22.10           | 0.06  | 0.21        | 0.13          |

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## Relative Humidity Calibration



| Reference Standards Calibration Information |               |              |                  |               |
|---|---------------|--------------|------------------|---------------|
| Model                                       | Serial Number | Asset Number | Calibration Date | Due Date      |
| Thunder Scientific 2500                     | 1311987       | 5011-0079    | Nov. 26, 2014    | May. 26, 2015 |
| Fluke 45                                    | 8817028       | 1011-0277    | Jan. 22, 2015    | Jan. 22, 2017 |
| Vaisala DMT348                              | C3040013      | 3011-0315    | Mar. 12, 2015    | Mar. 12, 2016 |

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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 in the chamber of a Thunder Scientific 2500. The instrument was allowed to stabilize for at least 30 minutes at each testpoint. A dry air line monitored by a Vaisala DMT348 was used to test 0 %RH.

Chemical Purge: A chemical purge was performed on the RH sensor before the instrument was adjusted or "As Left" data was taken. This was done to drive off any interfering chemicals that may have been absorbed by the sensor. Contamination most often causes a decrease in sensor gain. An interfering chemical may have been present on the sensor if the "After Purge" readings were higher than the "As Found" readings.

**References**

The Thunder Scientific 1200/2500 Two-Pressure Humidity Generator saturates a continuous stream of air with water vapor at a controlled pressure and temperature. The saturated high-pressure air then passes through an expansion valve to generate a specific humidity at the chamber pressure and temperature. The generator is traceable to NIST via Thunder Scientific or an MBW 373LHX chilled mirror hygrometer.

The Vaisala DMT348 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.

DOC228428 Rev. B

## CALIBRATION CERTIFICATE

After adjustment

**Customer** University of Alaska  
**Instrument** PTU300(500-1100) Digital Barometer  
**Serial number** J1620011  
**Manufacturer** Vaisala Oyj, Finland  
**Calibration date** 20th May 2015  
**Due Date** 20th May 2016

The above instrument was calibrated by comparing the readings of the instrument to the factory working standard of Vaisala.

The pressure readings of the factory working standard have been calibrated at an ISO/IEC 17025 accredited calibration laboratory using working standards traceable to the SI through a recognized national measurement institute.

### Calibration results

| Reference hPa | Observed hPa | Correction* hPa | Acceptance limit hPa |
|---------------|--------------|-----------------|----------------------|
| 500.10        | 500.10       | 0.00            | ± 0.05               |
| 550.10        | 550.10       | 0.00            | ± 0.05               |
| 650.09        | 650.09       | 0.00            | ± 0.05               |
| 750.04        | 750.04       | 0.00            | ± 0.05               |
| 850.02        | 850.02       | 0.00            | ± 0.05               |
| 949.98        | 949.98       | 0.00            | ± 0.05               |
| 999.99        | 999.99       | 0.00            | ± 0.05               |
| 1049.98       | 1049.98      | 0.00            | ± 0.05               |
| 1099.96       | 1099.96      | 0.00            | ± 0.05               |

\*To obtain the true pressure, add the correction to the barometer reading.

Interpolated corrections may be used at intermediate readings of the scale of the barometer.

### Equipment used in calibration

|             |                      |                         |                           |
|-------------|----------------------|-------------------------|---------------------------|
| <b>Type</b> | <b>Serial number</b> | <b>Calibration date</b> | <b>Certificate number</b> |
| PPC4        | 440                  | 2015-02-05              | 1500176732                |

### Uncertainty ( 95 % confidence level, k=2)

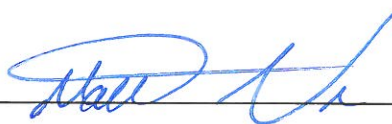
Pressure ± 0.07 hPa

### Ambient Conditions

Humidity 42 %RH ± 5 %RH  
 Temperature 23 °C ± 1 °C  
 Pressure 1005 hPa ± 1 hPa



Approved By



Technical Operator



# CALIBRATION CERTIFICATE

## Before adjustment

**Customer** University of Alaska  
**Instrument** PTU300(500-1100) Digital Barometer  
**Serial number** J1620011  
**Manufacturer** Vaisala Oyj, Finland  
**Calibration date** 20th May 2015  
**Due Date** 20th May 2016

The above instrument was calibrated by comparing the readings of the instrument to the factory working standard of Vaisala.

The pressure readings of the factory working standard have been calibrated at an ISO/IEC 17025 accredited calibration laboratory using working standards traceable to the SI through a recognized national measurement institute.

### Calibration results

| Reference<br>hPa | Observed<br>hPa | Correction*<br>hPa |
|------------------|-----------------|--------------------|
| 500.13           | 500.19          | -0.06              |
| 550.11           | 550.18          | -0.07              |
| 650.09           | 650.16          | -0.07              |
| 750.07           | 750.13          | -0.06              |
| 850.06           | 850.12          | -0.06              |
| 950.04           | 950.09          | -0.05              |
| 1000.04          | 1000.09         | -0.05              |
| 1050.01          | 1050.06         | -0.05              |
| 1100.01          | 1100.06         | -0.05              |

\*To obtain the true pressure, add the correction to the barometer reading.  
 Interpolated corrections may be used at intermediate readings of the scale of the barometer.

### Equipment used in calibration

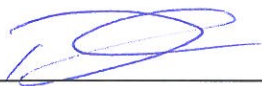
| Type | Serial number | Calibration date | Certificate number |
|------|---------------|------------------|--------------------|
| PPC4 | 440           | 2015-02-05       | 1500176732         |

### Uncertainty ( 95 % confidence level, k=2)


Pressure  $\pm 0.07$  hPa

### Ambient Conditions

Humidity 40 %RH  $\pm$  5 %RH  
 Temperature 23 °C  $\pm$  1 °C  
 Pressure 1011 hPa  $\pm$  1 hPa



Approved By



Technical Operator

