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CALIBRATION CERTIFICATE

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Certificate Number: ABOS221430003



Case Number:	291929
Customer:	K&S Technical Services
Address:	115 Barnacle Ct Middletown, DE 19709 US
Manufacturer:	Vaisala Oyj
Instrument:	Humidity and Temperature Probe HMP77B
Serial Number:	S1220325
Issue Date:	2022-04-06
Calibration Date:	2022-04-06
Recalibration Date:	2023-04-06

Approved by:

David Roeun
Service Technician

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k = 2$, which for a normal distribution corresponds to a coverage probability of approximately 95 %. The measurement results are traceable to the international system of units (SI) through national metrology institutes (NIST USA, MIKES Finland, or equivalent) or via ISO/IEC 17025 accredited calibration laboratories.

Procedure instructions: PI217623

This instrument was calibrated in compliance with ISO/IEC 17025:2017



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As Found and As Left Results

Humidity calibration results

Reference Humidity [%rh]	Reference Temperature [°C]	Observed Humidity [%rh]	Observed Temperature [°C]	Humidity Error [%rh]	Acceptance Limit [%rh]	Pass/Fail
0.4	21.53	0.0	21.43	-0.4	±1.0	Pass
33.0	21.53	33.4	21.43	0.4	±1.0	Pass
53.9	21.53	54.5	21.44	0.6	±1.0	Pass
75.1	21.53	75.3	21.44	0.2	±1.0	Pass
94.8	21.54	94.4	21.47	-0.4	±1.7	Pass

Temperature calibration results

Reference Temperature [°C]	Observed Temperature [°C]	Error [°C]	Acceptance Limit [°C]	Pass/Fail
21.53	21.44	-0.09	±0.20	Pass

Reference equipment used in calibration

Type	Instrument Number	Certificate Number	Calibration Date	Calibration Due Date
GE Drück DPS 823B	16738	K008-E01871	2021-05-04	2022-05-31
Pt-100 sensor	17322	220202-17322	2022-02-02	2023-02-28
PTU307	17293	220105-PTU307-M0930327	2022-01-05	2022-07-31
Pt-100 sensor	17000	220202-17000	2022-02-02	2023-02-28
PXI-4070	17569	2365857	2021-08-13	2022-08-31
PTU307	17293 / RH0	HMBOS15-22040001	2022-01-21	2022-04-30

Calibration uncertainty (k=2, ~95 % confidence level):

Humidity ±0.5 %rh @ 0...30 %rh, ±0.6 %rh @ 30...45 %rh, ±0.7 %rh @ 45...60 %rh, ±0.8 %rh @ 60...80 %rh, ±0.9 %rh @ 80...95 %rh
Temperature ±0.09 °C

Ambient conditions:

Humidity [%rh]
41 ± 4

Temperature [°C]
22 ± 2

Pressure [hPa]
1011 ± 20

Any error greater than the specification is noted with *

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Calibration note(s):

The humidity calibration was done by comparing the instrument humidity readings to the reference humidity generator readings in the Vaisala laboratory's permanent facility. The reference humidity readings were calculated based on two-pressure humidity generation principle using the measurement results of saturator pressure and temperature and calibration chamber pressure and temperature.

The temperature(s) of the instrument was calibrated by comparing the instruments's temperature readings to a reference thermometer.

Before measurements the instrument was allowed to stabilize to the conditions of the laboratory with power supply on. The purge function was run before the calibration if the instrument has the chemical purge option.

The measurement results were obtained from the measured values or the results were calculated from the measured values by using adjustment coefficients. The reference and instrument readings are averages of at least five independent observations. All relative humidity readings below freezing are compliant to WMO humidity calculation method. The dew point readings are frost point readings when dew point is below 0 °C if the readings are given as a dew point.

The 0 %rh humidity was measured in dry nitrogen gas or dry gas using the humidity meter as a reference if the 0 %rh humidity point was measured

The calibration uncertainty represents the situation at the time and conditions of calibration. When using the instrument at different conditions and at different time the effect of the conditions and stability of the instrument shall be evaluated separately. The calibration results and the statement of conformity with specification/acceptance limit relate only to the calibrated instrument and the calibration points.

The statement of conformity is based on simple acceptance, whether the calibration result is within or outside the manufacturer's specification/acceptance limits. The calibration uncertainty is not taken into account in the statement of conformity. The probability of accepting a non-conforming result or rejecting a conforming result can be as large as 50 % with this acceptance rule when the calibration result is close to the acceptance limit.

Pass or - = The calibration result is equal or within the manufacturer's acceptance limit.

Fail or * = The calibration result is outside the manufacturer's acceptance limit.

N/A = The calibration result acceptance limit is not specified.