

Instrument: Humidity and Temperature Transmitter HMT333
Order code: HMT330 3F0A002BCAC100A04AABAA1
Serial Number: M4650074
Manufacturer: Vaisala Oyj, Finland
Calibration date: 2016-11-24

Approved by:



Digitally signed by JCHO
 Date: 2016.11.24 21:11:50 +02:00
 Reason: Calibration responsible
 Location: Vaisala Oyj, Finland

The analog outputs of the instrument were calibrated by using working standards of the manufacturer. The outputs were forced by digital input to three output values. The observed values were determined by measuring the voltage over a calibrated precision resistor.

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 %. All analog calibration results are traceable to the National Institute of Standards and Technology (NIST, USA).

Analog output channel 1 calibration results

Channel 1 scaling: RH 0...100 %RH

Output forced to mA	Observed output mA	Difference mA	Acceptance mA	Pass/Fail
+2.000	+1.999	-0.001	±0.010	Pass
+10.000	+9.999	-0.001	±0.010	Pass
+18.000	+18.001	+0.001	±0.010	Pass

Analog output channel 2 calibration results

Channel 2 scaling: T -40...80 °C

Output forced to mA	Observed output mA	Difference mA	Acceptance mA	Pass/Fail
+2.000	+1.995	-0.005	±0.010	Pass
+10.000	+9.995	-0.005	±0.010	Pass
+18.000	+17.995	-0.005	±0.010	Pass

Analog output channel 3 calibration results

Channel 3 scaling: -

Output forced to mA	Observed output mA	Difference mA	Acceptance limit mA	Pass/Fail
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

Note(s): This is a new instrument with no As Found data available

Reference equipment used in calibration

Measured quantity	Type	Identity Number	Certificate Number	Calibration Date
Voltage	HP34970A	MY41014447	1250-307078194	2016-09-19
Current	Shunt Cable	ES 13615	Z01829	2016-06-13

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

Current ±0.00175mA

Ambient conditions:

Humidity [%RH] Temperature [°C] Pressure [hPA]
 20.00 ± 4 22.60 ± 2 1006.20 ± 20



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The humidity sensor of the instrument was calibrated by comparing the instrument's humidity reading to a generated reference humidity reading. The reference humidity reading was calculated based on two-pressure humidity generation principle, using the NIST traceable measurement results of saturator pressure and temperature and calibration chamber pressure and temperature.

The temperature sensor(s) of the instrument was calibrated by comparing the instrument's temperature readings to a reference thermometer calibrated at Vaisala Measurement Standards Laboratory (MSL).

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 %. Temperature and humidity calibrations are traceable to the National Institute of Standards and Technology (NIST, USA) via MSL.

Humidity calibration results

Reference Humidity [%RH]	Reference Temperature [°C]	Observed Humidity [%RH]	Observed Temperature [°C]	Humidity Error [%RH]	Acceptance Limit [%RH]	Pass/Fail
+15.0	+20.77	+14.6	+20.79	-0.4	±1.0	Pass
+33.0	+20.78	+33.1	+20.79	+0.1	±1.0	Pass
+54.0	+20.79	+53.8	+20.79	-0.2	±1.0	Pass
+74.8	+20.79	+74.8	+20.79	0.0	±1.0	Pass
+94.3	+20.81	+94.9	+20.80	+0.6	±1.7	Pass

Temperature calibration results

Reference Temperature [°C]	Observed Temperature [°C]	Error [°C]	Acceptance Limit [°C]	Pass/Fail
+20.79	+20.79	0.00	±0.10	Pass

Additional temperature probe calibration results

Reference Temperature [°C]	Observed Temperature [°C]	Error [°C]	Acceptance Limit [°C]	Pass/Fail
-	-	-	-	-

Note(s): This is a new instrument with no As Found data available

Reference equipment used in calibration

Measured Quantity	Type	Identity Number	Certificate Number	Calibration Date	Calibration Due Date
Calibration chamber pressure	PTU307	16863	K008-Z02099	2016-07-04	2017-07-31
Calibration chamber temperature	HMP307	17004	K008-Z03177	2016-11-08	2017-11-30
Saturator pressure	GE Druck DPS 823B	16734	K008-Z03273	2016-11-15	2017-05-31
Saturator temperature	AM1612	16666	K008-Z03175	2016-11-08	2017-11-30
Resistance measurement	PXI-4070	17055	Z03174	2016-11-08	2017-11-30

Calibration uncertainty ($k=2$, ~95% confidence level):
 Humidity ± 0.5 %RH @ 0...40 %RH, ± 0.8 %RH @ 40...95 %RH
 Temperature ± 0.10 °C

Ambient conditions:

Humidity [%RH] 22 \pm 4 Temperature [°C] 22 \pm 2 Pressure [hPA] 1007 \pm 20

