CHECKLIST FOR CERTIFICATE OF CALIBRATION/VALIDATION/TESTING REPORTS

A If Certificate Identifies an Accredited Laboratory:

☐ ILAC/MRA Signatory body accredited Laboratory

The Following Table lists the accredited laboratories

A2LA	L-A-B	ACLASS	IAS	PJLA	NVLAP

AND

- ☐ Name of Device (Optional)
- ☐ Model Number
- ☐ Serial Number
- ☐ Date of Calibration (Report or Issue Date)
- ☐ Measurement results indicate unit passed test and the documented uncertainty is within suitable limits (recommended uncertainty = +/- 1F (0.5C)

B If Certificate Does Not Identify an Accredited Laboratory:

- ☐ Name of Device (Optional)
- ☐ Model Number
- ☐ Serial Number
- ☐ Date of calibration testing (Report or Issue Date)
- ☐ Measurement results indicate unit passed test and the documented uncertainty is within suitable limits (recommended uncertainty = +/- 1F (0.5C)
- ☐ *Statement that calibration testing conforms to ISO 17025*

Certificate Of Calibration

Digital Thermometer W Thermistor Probe

Report No. 0926

ACCREDITED

Calibration Laboratory 23

Customer: TAGE HOSPITAL
185 GRAFT RD
TOWNS, VA 00216

Make: TROL COP

Model: 41CC with P10 PROBE

Serial # 8042

/Range: -200 TO 800 °C IN 0.01 °C DIVISIONS

Accuracy/Tolerance : +/- 0.1 % + 0.2 °C BELOW 200 °C

Item Received : IN TOLERANCE

Calibration Location: SCH Temperature Laboratory

Date Received: 09/26/2012

Calibration Date: 09/26/2012

Customer Specified Due Date: 09/2013

PO# : 011513

Contact: JAY BELCHER

Temperature: 21.6 TO 21.8 °C / RH% 47 TO 47

CONDITION RECEIVED : IN SPEC

Item Returned: IN TOLERANCE

Equipment Location: LAB

Notes : CALIBRATED AT CUSTOMERS SPECIFIED POINTS OF USE ONLY !

Nominal	Actual (STD)	Measured (UUT)	Deviation (UUT)	Units	Tolerance (±)	Uncertainty (±)	Pass/Fail
0	0.028	0.08	0.05	°C	0.20	0.09	PASS
20	20.017	20.15	0.13	°C	0.22	0.09	PASS
35	35.003	35.20	0.20	°C	0.24	0.09	PASS

Deviation rounded to the readability of UUT

The measurement traceability and calibration process used for conformance verification of the above instrument meets or exceeds the requirements of 17025:2005. The reported uncertainties reflect those of type B (Systematic errors associated with the standards and the procedure used), and type A (Random errors of the process). The type A and type B uncertainties where calculated in accordance with NIST technical Note 1297 using the RSS method and are reported at the coverage factor k=2 to approximate a confidence level of 95%. The due date as it appears on this report does not imply that the instrument will maintain its accuracy for any given length of time unless supported with further documentation (E.g. statistical etc.) which affirms such stability and is the responsibility of the end user. Many factors may contribute to instrument in-accuracy over time such as drift, environment, transportation, frequency of use etc. The reported results reflect readings obtained at the time of test only. The reported uncertainties reflect those associated with the calibration process itself and not the instrument under test. If the UUT is a digital electronic measurement instrument add 0.6 of the least significant digit to the above stated uncertainty. The instrument is considered to be in-tolerance based on the observed results (Deviation or departure from nominal value) falling anywhere within its specified tolerance limits without consideration of applied uncertainty. this document shall not be reproduced except in full without the written approval of Q.C. Services, Inc.

Procedure Used QCS 3015 (ORIG) (QCSTD 030106-3)

TRACEABLE STANDARDS USED:

Fluke 1522 S/N: A6C265	Cal Due : 10/2012	
ERTCO-EUTECHNICS S/N : 304526	Cal Due : 01/2013	X
HART SCI 1502 S/N 8B552	Cal Due : 04/2013	X

Certified by: Howard Richard Date: 09/26/2012

Approved By: Title: Metrologist Date: 09/26/2012

Example 1

Certificate Of Calibration

Digital Thermometer W Thermistor Probe

Report No. 0926

ACCREDITED

Calibration Laboratory 23

Customer: TAGE HOSPITAL
185 GRAFT RD
TOWNS, VA 00216

Date Received: 09/26/2012

Calibration Date: 09/26/2012

Make: TROL COP

Model: 41CC with P10PROBE

Serial # 8042

Customer Specified Due Date: 09/2013

PO# : 011513

Contact: JAY BELCHER

/Range: -200 TO 800 °C IN 0.01 °C DIVISIONS

Temperature: 21.6 TO 21.8 °C / RH% 47 TO 47

Accuracy/Tolerance : +/- 0.1 % + 0.2 °C BELOW 200 °C

CONDITION RECEIVED : IN SPEC

Item Received : IN TOLERANCE

Item Returned: IN TOLERANCE

Calibration Location: SCH Temperature Laboratory

Equipment Location: LAB

Notes : CALIBRATED AT CUSTOMERS SPECIFIED POINTS OF USE ONLY !

Nominal	Actual (STD)	Measured (UUT)	Deviation (UUT)	Units	Tolerance (±)	Uncertainty (±)	Pass/Fail
0	0.028	0.08	0.05	°C	0.20	0.09	PASS
20	20.017	20.15	0.13	°C	0.22	0.09	PASS
35	35.003	35.20	0.20	°C	0.24	0.09	PASS

Deviation rounded to the readability of UUT

The measurement traceability and calibration process used for conformance verification of the above instrument meets or exceeds the requirements of 17025:2005. The reported uncertainties reflect those of type B (Systematic errors associated with the standards and the procedure used), and type A (Random errors of the process). The type A and type B uncertainties where calculated in accordance with NIST technical Note 1297 using the RSS method and are reported at the coverage factor k=2 to approximate a confidence level of 95%. The due date as it appears on this report does not imply that the instrument will maintain its accuracy for any given length of time unless supported with further documentation (E.g. statistical etc.) which affirms such stability and is the responsibility of the end user. Many factors may contribute to instrument in-accuracy over time such as drift, environment, transportation, frequency of use etc. The reported results reflect readings obtained at the time of test only. The reported uncertainties reflect those associated with the calibration process itself and not the instrument under test. If the UUT is a digital electronic measurement instrument add 0.5 of the least significant digit to the above stated uncertainty. The instrument is considered to be in-tolerance based on the observed results (Deviation or departure from nominal value) falling anywhere within its specified tolerance limits without consideration of applied uncertainty. this document shall not be reproduced except in full without the written approval of Q.C. Services, Inc.

Procedure Used QCS 3015 (ORIG) (QCSTD 030106-3)

TRACEABLE STANDARDS USED:

Fluke 1522 S/N: A6C265	Cal Due : 10/2012	
ERTCO-EUTECHNICS S/N : 304526	Cal Due : 01/2013	X
HART SCI 1502 S/N 8B552	Cal Due : 04/2013	X

Certified by: Howard Richard

Date: 09/26/2012

Approved By:

Title: Metrologist

Date: 09/26/

Good Certificate

Meets all items under "A" from the Checklist

Example 1

Example 2

CERTIFICATE OF CALIBRATION AND TEST

REF ILR245 SN 245 0

Date **12/25/2012**

This product was assembled, tested and calibrated in accordance with the product specifications and FDA Quality System Regulations prior to release for shipment on the date indicated above. Product utilizes calibrated instrumentation traceable to NIST standards in the design, manufacturing, and inspection processes. The calibration results for this products chamber temperature monitoring system are recorded below.

NIST Factory Thermometer Reading: 22 °C ID# 010

Product Monitor Probe Reading: 22 °C

NIST Factory Thermometer Reading (Lower): (if applicable) 22 °C ID# 010

Product Monitor Probe Reading (Lower): (if applicable) 22 °C

SIGNATURE

1/2/2013

DATE

Example 2

CERTIFICATE OF CALIBRATION AND TEST

REF ILR245 SN 2450

Date **12/25/2012**

This product was assembled, tested and calibrated in accordance with the product specifications and FDA Quality System Regulations prior to release for shipment on the date indicated above. Product utilizes calibrated instrumentation traceable to NIST standards in the design, manufacturing, and inspection processes. The calibration results for this products chamber temperature monitoring system are recorded below.

NIST Factory Thermometer Reading: 22 °C ID# 010

Probe 22 °C

NIST Factory Thermometer Reading (Lower): (if applicable) 22 °C ID# 010

Product Monitor Probe Reading (Lower): (if applicable) 22 °C

Incomplete Certificate
Missing Multiple required items from Checklist

SIGNATURE

1/2/2013
DATE

Report Number:
9040

Report of Validation
Primary Temperature Lab

The PRT was calibrated at the following temperatures with the associated uncertainties. The uncertainty evaluation accounts for all known uncertainties present at the time of calibration including long-term behavior of the calibration system, measurement noise, and any short-term effects of the PRT. The uncertainties are reported at the calibration temperatures only. The uncertainties at intermediate temperatures can be computed from these values and the ITS-90 propagation of error curves. The uncertainties are reported at a coverage factor of 2 (k=2).

CALIBRATION POINT			TEMPERATURE	MEASURED	UNCERTAINTY
(point °C)	(type)	(SN)	t90(°C)	RESISTANCE	(mK)
-197.000	Comp	N/A	-197.000	4.6550	±6.0
-80.000	Comp	N/A	-80.000	17.2473	±10.0
-38.834	Comp	N/A	-38.834	21.5122	±6.0
0.010	Comp	N/A	0.010	25.4843	±4.0
In	FP	44013	156.599	41.0245	±6.0
Sn	FP	S7005	231.928	48.2361	±6.0
Zn	FP	S9007	419.527	65.4660	±9.0
Al	FP	17069	660.323	86.0321	±14.0

The following tables indicate the "As Found" RTPW nominal current, the dRTPW in mK, and dRTPW limit in mK. The dRTPW is the change in RTPW during the calibration, not the difference between the "As Found" and "As Left" RTPW. The value of current used in the calibration was 1.000 mA.

As Found Rtpw	dRtpw Observed	dRtpw Limit
1 mA 25.4848	0 mK	3 mK

The following values were determined for the RTPW and the coefficients of the pertinent deviation functions of the ITS-90. For best results, the RTPW value shown should be used as a baseline value for determining the stability of the PRT. The user should maintain a record of RTPW values measured as a routine operation and use these values when computing temperature.

Model:
5628

Serial No.
1819

Report date
1/25/13

Results for Nominal Current Calibration

RTPW = 25.4843
a4 = 3.478321 E-05
b4 = 4.228464 E-06
a7 = -2.581569 E-05
b7 = 1.838235 E-05
c7 = -1.226871 E-05

The attached interpolation table was generated from the coefficients listed above. The table is given in terms of resistance (Rt90) versus temperature (°C) at the nominal current. These tables can be used in cases where the readout instrument does not have the capability of computing temperature directly from the coefficients or as a check that the coefficients have been entered into the readout or computer program correctly. The following steps are used to compute temperature from measured resistances utilizing the table. (1) Determine the resistance at the temperature in question. (2) On the table, locate the two resistance values which surround the measured resistance. (3) Subtract the lower of the two from the measured resistance. (4) Divide the result by the sensitivity (dR/dt) from the adjacent column. (5) Add the product of this computation to the temperature which corresponds to the resistance value used in step (3). The additional uncertainty in the tabulated values is negligible (<=0.01mK) but when these tables are used, an additional uncertainty of approximately 0.1 mK should be assumed as a result of the required linear interpolation operation outlined above.

Nominal	Actual	Measured	Error	Calibration Tolerance	Pass/Fail
0.25	0.249996678	0.249996716	0.000000038	±0.000000250	P
1.0	0.9999107	0.9999104	-0.0000003	±0.0000010	P
4.0	3.9997406	3.9997418	0.0000012	±0.0000040	P

This calibration is traceable to NIST and calibration is compliant to NCSL/ISO/IEC 17025:2005.

Example 3

Performed by: _____

Mike Mike
Calibration Manager

Report Number:
9040

Report of Validation
Primary Temperature Lab

The PRT was calibrated at the following temperatures with the associated uncertainties. The uncertainty evaluation accounts for all known uncertainties present at the time of calibration including long-term behavior of the calibration system, measurement noise, and any short-term effects of the PRT. The uncertainties are reported at the calibration temperatures only. The uncertainties at intermediate temperatures can be computed from these values and the ITS-90 propagation of error curves. The uncertainties are reported at a coverage factor of 2 (k=2).

CALIBRATION POINT (point °C)	(type)	(SN)	TEMPERATURE t90(°C)	MEASURED RESISTANCE	UNCERTAINTY (mK)
-197.000	Comp	N/A	-197.000	4.6550	±6.0
-80.000	Comp	N/A	-80.000	17.2473	±10.0
-38.834	Comp	N/A	-38.834	21.5122	±6.0
0.010	Comp	N/A	0.010	25.4843	±4.0
In	FP	44013	156.599	41.0245	±6.0
Sn	FP	S7005	231.928	48.2361	±6.0
Zn	FP	S9007	419.527	65.4660	±9.0
Al	FP	17069	660.323	86.0321	±14.0

The following tables indicate the "As Found" RTPW nominal current, the dRTPW in mK, and dRTPW limit in mK. The dRTPW is the change in RTPW during the calibration, not the difference between the "As Found" and "As Left" RTPW. The value of current used in the calibration was 1.000 mA.

As Found Rtpw	dRtpw Observed	dRtpw Limit
1 mA 25.4848	0 mK	3 mK

The following values were determined for the RTPW and the coefficients of the pertinent deviation functions of [illegible] ITS-90. For best results, the RTPW value shown should be used as a baseline value for determining the [illegible] PRT. The user should maintain a record of RTPW values measured as a routine operation and use [illegible] computing temperature.

Model: 5628

Serial No. 1819

Report date 1/25/13

Results for Nominal Current Calibration

RTPW = 25.4843
a4 = 3.478321 E-05
b4 = 4.228464 E-06
a7 = -2.581569 E-05
b7 = 1.838235 E-05
c7 = -1.226871 E-05

Good Certificate
Meets all required items under "B" from the Checklist

The attached interpolation table was generated from the coefficients listed above. The table is given in terms of resistance (Rt90) versus temperature (°C) at the nominal current. These tables can be used in cases where the readout instrument does not have the capability of computing temperature directly from the coefficients or as a check that the coefficients have been entered into the readout or computer program correctly. The following steps are used to compute temperature from measured resistances utilizing the table. (1) Determine the resistance at the temperature in question. (2) On the table, locate the two resistance values which surround the measured resistance. (3) Subtract the lower of the two from the measured resistance. (4) Divide the result by the sensitivity (dR/dt) from the adjacent column. (5) Add the product of this computation to the temperature which corresponds to the resistance value used in step (3). The additional uncertainty in the tabulated values is negligible (<=0.01mK) but when these tables are used, an additional uncertainty of approximately 0.1 mK should be assumed as a result of the required linear interpolation operation outlined above.

Nominal	Actual	Measured	Error	Calibration Tolerance	Pass/Fail
0.25	0.249996678	0.249996716	0.000000038	±0.000000250	P
1.0	0.9999107	0.9999104	-0.0000003	±0.0000010	P
4.0	3.9997406	3.9997418	0.0000012	±0.0000040	P

This calibration is traceable to NIST and calibration is compliant to NCSL/ISO/IEC 17025:2005.

Example 3

Performed by: [signature]

Mike Mike
Calibration Manager

Calibration complies with ISO/IEC 17025, ANSI/NCSL Z540-1, and 9001

Cert. No.: 404

Certificate of Calibration for Monitoring Thermometer

Cust ID: Dept Public Hlth.
RMA:972198)

Instrument Identification:

Model: 61161-2 S/N: 1116649 Manufacturer: ConCon

Standards/Equipment:

Description	Serial Number	Due Date	NIST Traceable Reference
Temperature Calibration Bath TC-231	A79341		
Thermistor Module	A17118	2/01/13	1000311439
Temperature Probe	3039	2/14/13	6-BN9WZ-1-1
Temperature Calibration Bath TC-275	A9A237		
Digital Thermometer	122044330	1/24/13	4000-4146811

Certificate Information:

Technician: 6 Procedure: CAL Cal Date: 9/06/12 Cal Due: 9/06/17
Test Conditions: 26.5°C 38.0 %RH 1012 mBar

Calibration Data:

Unit(s)	Nominal	As Found	In Tol	Nominal	As Left	In Tol	Min	Max	±U	TUR
°C Probe		N.A.		0.00	0.6	Y	-1.0	1.0	0.06	>4:1
°C Probe		N.A.		25.00	25.5	Y	24.0	26.0	0.06	>4:1

This Instrument was calibrated using Instruments Traceable to National Institute of Standards and Technology.

A Test Uncertainty Ratio of at least 4:1 is maintained unless otherwise stated and is calculated using the expanded measurement uncertainty. Uncertainty evaluation includes the instrument under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM). The uncertainty represents an expanded uncertainty using a coverage factor k=2 to approximate a 95% confidence level. In tolerance conditions are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of Control Company.

Nominal=Standard's Reading; As Left=Instrument's Reading; In Tol=In Tolerance; Min/Max=Acceptance Range; ±U=Expanded Measurement Uncertainty; TUR=Test Uncertainty Ratio; Accuracy=±(Max-Min)/2; Min = As Left Nominal(Rounded) - Tolerance; Max = As Left Nominal(Rounded) + Tolerance; Date=MM/DD/YY

This certificate indicates calibration for external sensor only.

Rod Wallace , Quality

Berry, Nic Technical

Maintaining Accuracy:

In our opinion once calibrated your Monitoring Thermometer should maintain its accuracy. There is no exact way to determine how long calibration will be maintained. Monitoring Thermometers change little, if any at all, but can be affected by aging, temperature, shock, and contamination.

Recalibration:

For factory calibration and re-certification traceable to National Institute of Standards and Technology contact Control Company.

Example 4

Calibration complies with ISO/IEC 17025, ANSI/NCSL Z540-1, and 9001

Cert. No.: 404

Certificate of Calibration for Monitoring Thermometer

Cust ID: Dept Public Hlth
RMA:972198)

Instrument Identification:

Model: 61161-2 S/N: 1116649 Manufacturer: ConCon

Standards/Equipment:

Description	Serial Number	Due Date	NIST Traceable Reference
Temperature Calibration Bath TC-231	A79341		
Thermistor Module	A17118	2/01/13	1000311439
Temperature Probe	3039	2/14/13	6-BN9WZ-1-1
Temperature Calibration Bath TC-275	A9A237		
Digital Thermometer	122044330	1/24/13	4000-4146811

Certificate Information:

Technician: 6 Procedure: CAL Cal Date: 9/06/12 Cal Due: 9/06/17

Test Conditions: 26.5°C 38.0 Bar

Results

Uncertainty

Calibration Data:

Unit(s)	Nominal	As Found	In Tol	Nominal	As Left	In Tol	Min	Max	±U	TUR
°C Probe		N.A.		0.00	0.6	Y	-1.0	1.0	0.06	>4:1
°C Probe		N.A.		25.00	25.5	Y	24.0	26.0	0.06	>4:1

Pass/Fail or In Tolorance

This Instrument was calibrated using Instruments Traceable to National Institute of Standards and Technology

A Test Uncertainty Ratio of at least 4:1 is maintained unless otherwise stated and is calculated using the expanded measurement u... ...ncludes the instrument under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM). The uncertainty ... ...y using a coverage factor k=2 to approximate a 95% confidence level. In tolerance conditions are based on test results falling within specified limits with no reduc... ...rement. This results contained herein relate only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of Control Co...

Nominal=Standard's Reading; As Left=Instrument's Reading; In Tol=In Tolerance; Min/Max=Acceptance Range; ±U=Expanded Measurement Uncertainty; TUR=Test Uncertainty Ratio; Accuracy=±(Max-Min)/2; Min = As Left Nominal(Rounded) - Tolerance; Max = As Left Nominal(Rounded) + Tolerance; Date=MM/DD/YY

This certificate indicates calibration for external sensor only.

Rod Wallace , Quality

, Berry, Nic Technical

Maintaining Accuracy:

In our opinion once calibrated your Monitoring Thermometer should maintain its accuracy. There is no exact way to determine how long calibration will be maintained. Monitoring Thermometers change little, if any at all, but can be affected by aging, temperature, shock, and contamination.

Recalibration:

For factory calibration and re-certification traceable to National Institute of Standards and Technology contact Control Company.

Example 4

Good Certificate
Meets all required items under "B" from the Checklist

REPO CALIBRATION REPORT

Certificate # 130

Instrument ID	162	**Description**			
Manufacturer	CAR	**Model Number**	5000T	**Serial Number**	7620023
Calibrated	3/19/2013	**Frequency**	Annual	**Next Cal Date**	3/19/2014

Calibration Specifications

Group # 1
Group Name 2 PT CAL

Nom In Val / In Val	In Type	Std Accy	Acc %	+/-		Out Type	Fnd As	Lft As	Dev %	Pass/Fail
5.0 / 5.0	C	Plus / Minus	0.000000 / 0.000000	0.5	5.0	C	5.0	5.0	0.00%	Pass
-15.0 / -15.0	C	Plus / Minus	0.000000 / 0.000000	0.5	-15.0	C	-14.5	-14.5	-3.33%	Pass

Test Instruments Used During the Calibration

					(As Of Cal Entry Date)	
Test Instrument ID	Description	Manufacturer	Model Number	Serial Number	Last Cal Date	Next Cal Date
HART PRECSION RTD		HART SCIENTIFIC	1502A	A1B599	5/21/2012	5/21/2013

Notes about this calibration

Company Inc. certifies that the above equipment has been calibrated using instrumentation and standards that are traceable to the National Institute of Standards and Technology (NIST) through certification documents on file. This calibration complies with MIL-STD-45662A and ISO 17025, Test Uncertainty Ratio ≥ 4:1 unless otherwise stated.

Example 5

Calibration Result Calibration Successful
Who Calibrated Davis Calvin

Finalized By Huson
Date Finalized 3/19/2013

REPO CALIBRATION REPORT

Certificate # 130

Instrument ID 162
Manufacturer CAR
Calibrated 3/19/2013

Description
Model Number 5000T
Frequency Annual

Serial Number7620023
Next Cal Date 3/19/2014

Calibration Specifications

Group # 1
Group Name 2 PT CAL

Results

Nom In Val / In Val	In Type	Std Accy	Acc %	+/-		Out Type	End As	Lft As	Dev %	Pass/Fail
5.0 / 5.0	C	Plus / Minus	0.000000 / 0.000000	0.5	5.0	C	5.0	5.0	0.00%	Pass
-15.0 / -15.0	C	Plus / Minus	0.000000 / 0.000000	0.5	-15.0	C	-14.5	-14.5	-3.33%	Pass

Uncertainty

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

Test Instrument ID	Description	Manufacturer	Model Number	Serial Number	Last Cal Date	Next Cal Date
HART PRECSION RTD		HART SCIENTIFIC	1502A	A1B599	5/21/2012	5/21/2013

Notes about this calibration

Company Inc. certifies that the above equipment has been calibrated using instrumentation and standards that are traceable to the National Institute of Standards and Technology (NIST) through certification documents on file. This calibration complies with MIL-STD-45662A and ISO 17025, Test Uncertainty Ratio ≥ 4:1 unless otherwise stated.

Example 5

Good Certificate
Meets all required items under "B" from the Checklist

Calibration Result Calibration Successful
Who Calibrated Davis Calvin

Finalized By Huson
Date Finalized 3/19/2013

11

INSTRUMENT CALIBRATION REPORT

CDC

Certificate # 4701

Instrument ID	16238	Description			
Manufacturer	LASCAR	Model Number	VI5000T	Serial Number	010023762
Calibrated	3/19/2013	Frequency	Annual	Next Cal Date	3/19/2014

Calibration Specifications

Group # 1
Group Name 2 PT CAL

Nom In Val / In Val	In Type	Std Accy	Acc %	+/-		Out Type	Fnd As	Lft As	Dev %	Pass/Fail
5.0 / 5.0	C	Plus / Minus	0.000000 / 0.000000	0.5	5.0	C	5.0	5.0	0.00%	Pass
-15.0 / -15.0	C	Plus / Minus	0.000000 / 0.000000	0.5	-15.0	C	-14.5	-14.5	-3.33%	Pass

Test Instruments Used During the Calibration

Test Instrument ID	Description	Manufacturer	Model Number	Serial Number	(As Of Cal Entry Date) Last Cal Date	Next Cal Date
HART PRECSION RTD		HART SCIENTIFIC	1502A	A1B599	5/21/2012	5/21/2013

Notes about this calibration

SolConut certifies that the above equipment has been calibrated using instrumentation and standards that are traceable to the National Institute of Standards and Technology (NIST) through certification documents on file. This calibration complies with MIL-STD-45662A and ISO 10012-1 and ANSI/NCSL Z540-1-1994. Test Uncertainty Ratio ≥ 4:1 unless otherwise stated.

Example 6

SolConut
Phone: (888) 555-0636
Fax: (555) 555-5419

Calibration Result Calibration Successful
Who Calibrated Cole Hu

Finalized By Crav Swin
Date Finalized 3/19/2013 10:52:24AM

INSTRUMENT CALIBRATION REPORT

CDC

Certificate # 4701

Instrument ID 16238 | Description | Serial Number 010023762
Manufacturer LASCAR | Model Number VJ5000T | Next Cal Date 3/19/2014
Calibrated 3/19/2013 | Frequency Annual

Calibration Specifications

Group # 1
Group Name 2 PT CAL

Nom In Val / In Val	In Type	Std Accy	Acc %	+/-		Out Type	Fnd As	Lft As	Dev %	Pass/Fail
5.0 / 5.0	C	Plus / Minus	0.000000 / 0.000000	0.5	5.0	C	5.0	5.0	0.00%	Pass
-15.0 / -15.0	C	Plus / Minus	0.000000 / 0.000000	0.5	-15.0	C	-14.5	-14.5	-3.33%	Pass

Test Instruments Used During the Calibration

Test Instrument ID	Description	Manufacturer	Model Number	Serial Number	(As Of Cal Entry Date) Last Cal Date	Next Cal Date
HART PRECSION RTD		HART SCIENTIFIC	1502A	A1B599	5/21/2012	5/21/2013

Notes about this calibration

SolConut certifies that the above equipment has been calibrated using instrumentation and standards that are traceable to the National Institute of Standards and Technology (NIST) through certification documents on file. This calibration complies with MIL-STD-45662A and ISO 10012-1 and ANSI/NCSL Z540-1-1994. Test Uncertainty Ratio ≥ 4:1 unless otherwise stated.

Example 6

Incomplete Certificate
Missing ISO 17025 Statement

SolConut
Phone: (888) 555-0636
Fax: (555) 555-5419

Calibration Rest
Who Calibrat

Finalized By Crav Swin
Date Finalized 3/19/2013 10:52:24AM

SAL

Testing Certificate

Company
Corporation
Street
USA

Certificate Number:	01845	Ambient Temperature(°C):	Min: 21.4 Max: 23.8
Model Number:	VL-200	Ambient Humidity(%RH):	Min: 30.0 Max: 59.6
Serial Number:	120521	Method:	Calibration by comparison
Procedures:	VCP1009 VCP1010		

The calibration(s) on this report are traceable to the United States of America National Institute of Standards and Technology or to other recognized national or international standards or to accepted values of natural physical constants, and are accredited to ISO/IEC 17025. The laboratory meets the requirements of ANSI/NCSL Z540-1. Using methods detailed in the ISO "Guide to the Expression of Uncertainty in Measurement", reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2. The calibrations were performed equivalently either with minimum test uncertainty ratios of 4:1 using a coverage factor of k = 2, or with the statistical method of guard banding to reduce test limits. The results relate only to the item(s) calibrated.

CALIBRATION REFERENCE EQUIPMENT

	Serial #	Calibration Date Last	Next
Hart Scientific Black Stack Thermistor Scanner Module Model 2564	A39287	27-Nov-11	27-Nov-12
Thunder Scientific Humidity Generator 2500 ST-LT	1007799	28-Jul-11	28-Jul-12
Hart Scientific Thermistor Temperature Probe Model 5610	B0B1519	18-Jan-12	18-Jan-13

CALIBRATION TEST RESULTS

Chan	Test Description	Units	Reference	Measurement Uncertainty	As Left Result	Diff
1	Temperature	°C	-25.34	0.06	-25.33	0.01
1	Temperature	°C	9.64	0.05	9.65	0.01
1	Temperature	°C	25.01	0.04	25.01	0.00
1	Temperature	°C	44.73	0.06	44.71	0.02
1	Temperature	°C	69.55	0.07	69.55	0.00
2	Relative Humidity at 10°C	%RH	45.00	0.60	45.52	0.52
2	Relative Humidity at 25°C	%RH	11.00	0.60	11.34	0.34
2	Relative Humidity at 25°C	%RH	45.00	0.60	45.26	0.26
2	Relative Humidity at 25°C	%RH	80.00	0.60	80.27	0.27
2	Relative Humidity at 45°C	%RH	45.00	0.60	45.27	0.27

Maintaining Calibration

The electronic components in this data logger are of the highest quality. The unit has been designed to remain within its specifications. The length of in-calibration service can be affected by aging, temperature and shock. For those users with critical needs such as accreditation demands, government specifications, or ISO requirements, we recommend that the unit be calibrated on a periodic basis.

Calibration Technician: Crend Pr

Calibration Tech: Cre

Calibration

Information on calibration services is available at the address below. This data logger was calibrated by:

Sal Inc.
100-Pkwy
Richmond, CA 2874
Toll Free: 1-800-555-8374, Phone: 555-555-5850, Fax: 555-555-2874
Email: support@sal.com

Calibration Date: 19-Jul-2012

Next Calibration: 19-Jul-2013

Example 7

SAL

Calibration Certificate

ACCREDITED
CALIBRATION LABORATORY
CERTIFICATE # 2069.01

Company
Corporation
Street
USA

Certificate Number: 01845
Model Number: VL-200
Serial Number: 120521
Procedures: VCP1009 VCP1010

Ambient Temperature(°C): Min: 21.4 Max: 23.8
Ambient Humidity(%RH): Min: 30.0 Max: 59.6
Method: Calibration by comparison

The calibration(s) on this report are traceable to the United States of America National Institute of Standards and Technology or to other recognized national or international standards or to accepted values of natural physical constants, and are accredited to ISO/IEC 17025. The laboratory meets the requirements of ANSI/NCSL Z540-1. Using methods detailed in the ISO "Guide to the Expression of Uncertainty in Measurement", reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2. The calibrations were performed equivalently either with minimum test uncertainty ratios of 4:1 using a coverage factor of k = 2, or with the statistical method of guard banding to reduce test limits. The results relate only to the item(s) calibrated.

CALIBRATION REFERENCE EQUIPMENT

	Serial #	Calibration Date Last	Next
Hart Scientific Black Stack Thermistor Scanner Module Model 2564	A39287	27-Nov-11	27-Nov-12
Thunder Scientific Humidity Generator 2500 ST-LT	1007799	28-Jul-11	28-Jul-12
Hart Scientific Thermistor Temperature Probe Model 5610	B0B1519	18-Jan-12	18-Jan-13

CALIBRATION TEST RESULTS

Chan	Test Description	Units	Reference	Measurement Uncertainty	As Left Result	Diff.
1	Temperature	°C	-25.34	0.06	-25.33	0.01
1	Temperature	°C	9.64	0.05	9.65	0.01
1	Temperature	°C	25.01	0.04	25.01	0.00
1	Temperature	°C	44.73	0.06	44.71	0.02
1	Temperature	°C	69.55	0.07	69.55	0.00
2	Relative Humidity at 10°C	%RH	45.00	0.60	45.52	0.52
2	Relative Humidity at 25°C	%RH	11.00	0.60	11.34	0.34
2	Relative Humidity at 25°C	%RH	45.00	0.60	45.26	0.26
2	Relative Humidity at 25°C	%RH	80.00	0.60	80.27	0.27
2	Relative Humidity at 45°C	%RH	45.00	0.60	45.27	0.27

Incomplete Certificate Does Not Clearly State If Unit Passed

Maintaining Calibration

The electronic components in this data logger are of the highest quality. The unit has been designed to remain within its specifications. The length of in-calibration service can be affected by aging, temperature and shock. For those users with critical needs such as accreditation demands, government specifications, or ISO requirements, we recommend that the unit be calibrated on a periodic basis.

Calibration Technician: Crend Pi

Technician: Suz Cre

Calibration

Information on calibration services is available at the address below. This data logger was calibrated by:

Sal Inc.
100-Pkwy.
Richmond, CA 2874
Toll Free: 1-800-555-8374, Phone: 555-555-5850, Fax: 555-555-2874
Email: support@sal.com,

Calibration Date: 19-Jul-2012

Next Calibration: 19-Jul-2013

Example 7

Certificate Testing Inc.

CALIBRATION CERTIFICATE

Certificate # 130416

System ID:	Aurora Specialty	Calibration Date/Time:	2013/04/16 07:35 AM
Component ID:	RF1-TE2	Calibrated By:	Pody Wall
Equipment Type:	Temperature Loop	Quality Approval:	Johnn Loo 2013/04/18
Description:	TE-02 Temperature Loop	Next Event Due Date:	2014/04/30
Instrument Location:	Zone East	Next Event Name:	Annual Calibration
Manufacturer:	Precon	Customer Name/Contact:	Phel
Model:	ST-S81E	Customer Location:	34 Fraser ST, CA 11800
Serial Number:	N1800	Calibration Results:	Pass
Instrument Range:	-200 to 800 °C	Out of Tolerance:	Init.
Tolerance:	± 0.5 °C	Ambient Condition:	69 °F / 27 %RH

CALIBRATION DATA

		AS FOUND			AS LEFT		
Parameter:	**Units:**	**Setpoint:**	**Data:**	**Deviation:**	**Setpoint:**	**Data:**	**Deviation:**
NA	°C	15.91	15.8	-0.11	NP	NP	
NA	°C	1.62	1.7	0.08	NP	NP	
NA	°C	5.05	5.1	0.05	NP	NP	

Example 8

Reference Standard Used (Mfg, Model #, Serial # or Lot #, and Calibration Due Date):	Procedure Used:
Hart Scientific, 1521, A22097, 2013/07/26 Hart Scientific, 5613, 711917, 2013/04/25	SOP-4-146- 05, 2011/12/16

Comments:

Reference Standard was placed as close to the U.U.T. as possible to obtain a stable reading.
Calibration offset "As Found" 0.0. Calibration offset "As Left" 0.0. KLP 16APR2013

Customer Approval (Optional)-Reviewed By/Date:_____ Quality Approval/Date:_____

Certificate Testing Inc.

CALIBRATION CERTIFICATE

Certificate # 130416

System ID:	Aurora Specialty	Calibration Date/Time:	2013/04/16 07:35 AM
Component ID:	RF1-TE2	Calibrated By:	Pody Wall
Equipment Type:	Temperature Loop	Quality Approval:	Johnn Loo 2013/04/18
Description:	TE-02 Temperature Loop	Next Event Due Date:	2014/04/30
Instrument Location:	Zone East	Next Event Name:	Annual Calibration
Manufacturer:	Precon	Customer Name/Contact:	Phel
Model:	ST-S81E	Customer Location:	34 Fraser ST, CA 11800
Serial Number:	N1800	Calibration Results:	Pass
Instrument Range:	-200 to 800 °C	Out of Tolerance:	Init.
Tolerance:	± 0.5 °C	Ambient Condition:	69 °F / 27 %RH

CALIBRATION DATA

		AS FOUND			AS LEFT		
Parameter:	**Units:**	**Setpoint:**	**Data:**	**Deviation:**	**Setpoint:**	**Data:**	**Deviation:**
NA	°C	15.91	15.8	-0.11	NP	NP	
NA	°C	1.62	1.7	0.08	NP	NP	
NA	°C	5.05	5.1	0.05	NP	NP	

Example 8

Reference Standard Used (Mfg, Model #, Serial # or Lot #, and Calibration Due Date):

Hart Scientific, 1521, A22097, 2013/07/26
Hart Scientific, 5613, 711917, 2013/04/25

Procedure Used:

SOP-4-146- 05, 2011/12/16

Comments:
Reference Standard was placed as close to the U.U.T. as possible to obtain a stable reading.
Calibration offset "As Found" 0.0. Calibration offset "As Left" 0.0. KLP 16APR2013

Incomplete Certificate
Missing Test Results Uncertainty ISO 17025 Statement

Customer Approval (Optional)-Reviewed By/Date:_____ Quality Approval/Date:_____