



Calibration complies with ISO/IEC 17025 AND ANSI/NCSL Z540-1



Cert. No.: 4088-1536916

Traceable® Certificate of Calibration for Hygrometer/Thermometer

Instrument Identification:

Model: 11-661-7D S/N: 72131857 Manufacturer : Control Company

Standards/Equipment:

Description	Serial Number	Due Date	NIST Traceable Reference
Chilled Mirror Hygrometer	31874/H2048MCR	7/05/07	5354
Multimeter	3146A35228	10/25/07	1000213862
Digital Thermometer	230181029	11/01/07	4007-1430153

Certificate Information:

Technician: 104 Procedure: CAL-17 Cal Date: 3/19/07 Cal Due: 3/18/09
Test Conditions: 22.0°C 53.0 %RH 1020 mBar

Calibration Data: (New Instrument)

Unit(s)	Nominal	As Found	In Tol	Nominal	As Left	In Tol	Min	Max	±uc	TUR
°C		N.A.		23.647	23.3	Y	22.6	24.6	0.059	>4:1
%RH		N.A.		52.394	50	Y	50	54	1.050	1.9:1

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; ±uc=Measurement Uncertainty; TUR=Test Uncertainty Ratio; Accuracy=±(Max-Min)/2

Wallace Berry
Wallace Berry, Technical Manager

Maintaining Accuracy:

In our opinion once calibrated your Hygrometer/Thermometer should maintain its accuracy. There is no exact way to determine how long calibration will be maintained. Hygrometer/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.

CONTROL COMPANY 4455 Rex Road Friendswood, TX 77546 USA
Phone 281 482-1714 Fax 281 482-9448 service@control3.com www.control3.com

Control Company is an ISO 17025 Calibration Laboratory Accredited by (A2LA) American Association for Laboratory Accreditation, Certificate No. 1750.01.
Control Company is ISO 9001 Quality Certified by (DNV) Det Norske Veritas, Certificate No. CERT-01805-AQ-HOU.
International Laboratory Accreditation Cooperation (ILAC) - Multilateral Recognition Arrangement (MRA).

AALBORG INSTRUMENTS & CONTROLS, INC.

20 Corporate Drive, Orangeburg New York 10962 USA
+1 (845) 398-3160

MASS FLOW CALIBRATION DATA SHEET

CUSTOMER:	COLE-PARMER INSTRUMENT CO.
PURCHASE ORDER NUMBER:	VL331
SERIAL NUMBER:	G207072-2
MODEL NUMBER:	GFM37
GAS:	Air
FLOW RANGE:	0-50 L/min
CALIBRATION PRESSURE:	14.7PSIA
CALIBRATION TEMPERATURE:	70F(21.1C)
VOLTAGE INPUT:	12V
UNCERTAINTY (ACCURACY):	±1.5%FS

CALIBRATION DATA

PERCENT F.S RANGE (% F.S.)	LINEAR OUTPUT		NOMINAL FLOW (L/min)	ACTUAL FLOW (L/min)	DEVIATION (% F.S)
	(VDC)	(mA)			
0.0	0.00	4.00	0.0	0	0.0
25.0	1.25	8.00	12.5	12.6	0.2
50.0	2.50	12.00	25.0	25.1	0.2
75.0	3.75	16.00	37.5	37.6	0.2
100.0	5.00	20.00	50.0	50.0	0.0

TEST EQUIPMENT

INSTRUMENT		Calibration due	INSTRUMENT		Calibration due
NWS	Barometer	---	n/a	Thermometer	n/a
CS96100014	Calibrator	03-Nov-2008	n/a	Electronic timer	n/a

This instrument is certified against standards which are supported by N.I.S.T. test #18010C.
The calibration is performed by passing a calibrated flow through a calibrated instrument and then is collected in a calibrator. Here timing, collected volume, pressure and flow temperature measurements are performed. All instruments used in the calibration procedure are certified against standards traceable to N.I.S.T. Calibration uncertainty: +/-1%FS.

REPORT NO: 0308:260	CALIBRATION DATE: : 14-Mar-2008	RECALIBRATION DUE DATE:	RECOMMENDED 12 MONTHS FROM PURCHASE DATE
TECHNICIAN SEKINDA	APPROVED BY:		LAB. MANAGER OR AUTHORIZED PERSON

This report shall not be reproduced except in full, without the written approval of the laboratory



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



Cert. No.: 4000-2256073

Traceable® Certificate of Calibration for Digital Thermometer

Instrument Identification:

Vermont Dept. Of Health Lab, 195 Colchester Avenue, Attn. Edmond Luce, Burlington, VT 05402 U.S.A. (RMA:949124)
Model: 15-077-8 S/N: 240118616 Manufacturer : Control Company
Model: 15-077-7 S/N: 240118587

COPY

Standards/Equipment:

Description	Serial Number	Due Date	NIST Traceable Reference
Temperature Calibration Bath TC179	A45240		
Thermistor Module	A17118	11/08/09	A8B10067
Temperature Probe	128	11/17/09	A8B10050
Temperature Calibration Bath TC231	A79341		
Thermistor Module	A17118	11/08/09	A8B10067
Temperature Probe	3039	11/26/09	A8B11055
Temperature Probe	149	6/06/09	A82225037-3
Thermistor Module	A27129	8/22/09	1000248949
Temperature Calibration Bath TC218	A73332		

Certificate Information:

Technician: 68 Procedure: CAL-06 Cal Date: 5/07/09 Cal Due: 5/07/10
Test Conditions: 24.5°C 46.0 %RH 1015 mBar

Calibration Data:

Unit(s)	Nominal	As Found	In Tol	Nominal	As Left	In Tol	Min	Max	±uc	TUR
°C	0.001	0.249	N	0.001	-0.001	Y	-0.049	0.051	0.013	3.8:1
°C	25.001	25.026	Y	25.001	24.998	Y	24.951	25.051	0.013	3.8:1
°C	60.001	59.981	Y	60.001	60.004	Y	59.951	60.051	0.018	2.8:1
°C	100.001	100.009	Y	100.001	100.008	Y	99.951	100.051	0.013	3.8:1

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; ±uc=Measurement Uncertainty; TUR=Test Uncertainty Ratio; Accuracy=±(Max-Min)/2; Min = Nominal(Rounded) - Tolerance; Max = Nominal(Rounded) + Tolerance; Date=MM/DD/YY

Nicol Rodriguez
Nicol Rodriguez, Quality Manager

Wallace Berry
Wallace Berry, Technical Manager

Maintaining Accuracy:

In our opinion once calibrated your Digital Thermometer should maintain its accuracy. There is no exact way to determine how long calibration will be maintained. Digital 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.

CONTROL COMPANY 4455 Rex Road Friendswood, TX 77546 USA
Phone 281 482-1714 Fax 281 482-9448 service@control3.com www.control3.com

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Control Company is ISO 9001:2008 Quality Certified by (DNV) Det Norske Veritas, Certificate No. CERT-01805-2008-AQ-HOU-ANAB.
International Laboratory Accreditation Cooperation (ILAC) - Multilateral Recognition Arrangement (MRA).

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



Cert. No.: 4000-2256073

Customer Notice for Digital Thermometer

Vermont Dept. Of Health Lab, 195 Colchester Avenue, Attn. Edmond Luce, Burlington, VT 05402 U.S.A. (RMA:949124)

COPY

Tolerance Notification

Cal Date: 5/07/09

Model: 15-077-8

Serial Number: 240118616

Upon incoming inspection and test, this Instrument was found to be significantly **OUT OF TOLERANCE**, please reference the calibration certificate for the **As Found Calibration Data**. We are providing this notification to fulfill the requirements of **ANSI/NCSL Z540-1**.

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International Laboratory Accreditation Cooperation (ILAC) - Multilateral Recognition Arrangement (MRA).



Calibration
Certificate No. 1750.01

Calibration complies with
ISO/IEC 17025 AND ANSI/NCSL Z540-1



Cert. No.: 4000-1832124

Traceable® Certificate of Calibration for Digital Thermometer

Instrument Identification:

State Of VT Hlth Dept, 195 Colchester Ave, Attn: Steven Harnois, Burlington, VT 05401 U.S.A. (RMA:941648)

Model: 15-077-8 S/N: 240118616 Manufacturer : Control Company

Model: 15-077-7 S/N: 240118587

Standards/Equipment:

Description	Serial Number	Due Date	NIST Traceable Reference
Temperature Calibration Bath TC155	93139		
Thermistor Module	A17118	8/30/08	A7831032
Temperature Probe	157	4/14/08	A6B06053
Temperature Calibration Bath TC191	A79341		
Thermistor Module	A27129	7/17/08	1000228256
Temperature Probe	3039	7/26/08	A7710039-4

Certificate Information:

Technician: 68

Procedure: CAL-06

Cal Date: 3/07/08

Cal Due: 3/07/09

Test Conditions: 24.0°C 32.0 %RH 1016 mBar

Calibration Data:

Unit(s)	Nominal	As Found	In Tol	Nominal	As Left	In Tol	Min	Max	±uc	TUR
°C	0.001	0.304	N	0.001	-0.002	Y	-0.049	0.051	0.013	3.8:1
°C	25.001	24.977	Y	25.001	24.999	Y	24.951	25.051	0.013	3.8:1
°C	60.001	60.080	N	60.001	60.005	Y	59.951	60.051	0.013	3.8:1
°C	100.001	100.165	N	100.001	99.996	Y	99.951	100.051	0.013	3.8:1

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.

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Wallace Berry
Wallace Berry, Technical Manager

Maintaining Accuracy:

In our opinion once calibrated your Digital Thermometer should maintain its accuracy. There is no exact way to determine how long calibration will be maintained. Digital 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.

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Control Company is ISO 9001 Quality Certified by (DNV) Det Norske Veritas, Certificate No. CERT-01805-AQ-HOU.
International Laboratory Accreditation Cooperation (ILAC) - Multilateral Recognition Arrangement (MRA).

Calibration complies with
ISO/IEC 17025 AND ANSI/NCSL Z540-1



Cert. No.: 4000-1832125

Customer Notice for Digital Thermometer

State Of VT Hlth Dept, 195 Colchester Ave, Attn: Steven Harnois, Burlington, VT 05401 U.S.A. (RMA:941648)

Tolerance Notification

Cal Date: 3/07/08

Model: 15-077-8

Serial Number:240118616

Upon incoming inspection and test, this Instrument was found to be significantly **OUT OF TOLERANCE**, please reference the calibration certificate for the **As Found Calibration Data**. We are providing this notification to fulfill the requirements of **ANSI/NCSL Z540-1**.

CONTROL COMPANY 4455 Rex Road Friendswood, TX 77546 USA
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International Laboratory Accreditation Cooperation (ILAC) - Multilateral Recognition Arrangement (MRA).



**Calibration complies with
ISO/IEC 17025 AND ANSI/NCCL Z540-1**



Cert. No.: 4000-1461719

Traceable® Certificate of Calibration for Digital Thermometer

Instrument Identification:

State Of VT Hlth Dept, 195 Colchester Ave, Attn: Steven Harnois, Burlington, VT 05401 U.S.A. (RMA:935907)

Model: 15-077-8 S/N: 240118616 Manufacturer : Control Company

Model: 15-077-7 S/N: 240118587

Standards/Equipment:

Description	Serial Number	Due Date	NIST Traceable Reference
Temperature Probe	128	3/07/07	A5B28010-1
Thermistor Module	A27129	7/10/07	1000207694
Temperature Calibration Bath TC179	A45240		
Temperature Probe	157	11/14/07	A6B06053
Thermistor Module	A17118	8/23/07	A6823089
Temperature Calibration Bath TC191	A42238		

Certificate Information:

Technician: 68 Procedure: CAL-06 Cal Date: 12/20/06 Cal Due: 12/20/07
 Test Conditions: 22.0°C 55.0 %RH 1013 mBar

Calibration Data:

Unit(s)	Nominal	As Found	In Tol	Nominal	As Left	In Tol	Min	Max	±uc	TUR
°C	-0.001	-0.014	Y	0.001	-0.001	Y	-0.049	0.051	0.013	3.8:1
°C	24.999	24.986	Y	25.000	24.995	Y	24.950	25.050	0.013	3.8:1
°C	59.999	59.526	N	60.001	60.000	Y	59.951	60.051	0.013	3.8:1
°C	100.001	99.833	N	100.001	100.005	Y	99.951	100.051	0.013	3.8:1

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

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Wallace Berry
Wallace Berry, Technical Manager

Maintaining Accuracy:

In our opinion once calibrated your Digital Thermometer should maintain its accuracy. There is no exact way to determine how long calibration will be maintained. Digital 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.

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 International Laboratory Accreditation Cooperation (ILAC) - Multilateral Recognition Arrangement (MRA).

Calibration complies with
ISO/IEC 17025 AND ANSI/NC SL Z540-1



Cert. No.: 4000-1461719

Customer Notice for Digital Thermometer

State Of VT Hlth Dept, 195 Colchester Ave, Attn: Steven Harnois, Burlington, VT 05401 U.S.A. (RMA:935907)

Tolerance Notification

Cal Date: 12/20/06

Model: 15-077-8

Serial Number:240118616

Upon incoming inspection and test, this instrument was found to be significantly **OUT OF TOLERANCE**, please reference the calibration certificate for the **As Found Calibration Data**. We are providing this notification to fulfill the requirements of **ANSI/NC SL Z540-1**.

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International Laboratory Accreditation Cooperation (ILAC) - Multilateral Recognition Arrangement (MRA).



Thermometer Certification

Calibration Report

Customer: Vt. Dept. of Health, Public Health lab
195 Colchester Ave., Burlington, VT, 05402

Make: Fisher / Ertco	Date Received: 8/30/2006
Model: 4000	Calibration Date: 9/5/2006
Instrument #: 240118616	Cust. Spec. Due Date*: 9/30/2007
Test #: T090506-4	PO#: S07-0086
Scale Range: -50 ~ 150°C in 0.001° divisions	Contact: Steve Harnois
Partial Immersion <input checked="" type="checkbox"/>	Description: Dig. Therm. w/ thermistor
Total Immersion <input type="checkbox"/>	Condition Received: Good-in case
Other (See Notes) <input type="checkbox"/>	Lab Temperature (°C) 19.5 ~ 20.7
	Lab Humidity RH% 46 ~ 50

Standards Used

Description	Serial No.	Due Date	Report No.
Hart PRT / Tweener	8B552	2/28/2007	A6123016

Thermometer Corrections/Readings °C					
Temp Set	STD	UUT	Deviation	Correction	(+/-) Uncertainty
0.00	-0.010	0.014	0.024	-0.02	0.09
34.00	33.999	33.939	-0.060	0.06	0.09
50.00	50.006	49.912	-0.094	0.09	0.09
100.00	99.970	99.815	-0.155	0.16	0.09

- Traceability: The standards referenced in this report are traceable to the National Institute of Standards and Technology. Calibrations are performed in accordance with Procedure SOP qcs3015 orig.
- All temperatures in this report are based on the (ITS-90) International Scale of 1990.
- Uncertainties are reported in accordance with NIST Technical Note 1297, and include the uncertainty associated with the standards used (type B), combined with the uncertainty associated with the measurement process (type A), in the root sum square formula using a coverage factor of K=2 for a confidence level of approximately 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 an instruments in-accuracy over time such as drift, environment, transport, frequency of use etc. The reported results reflect readings obtained at the time of test only.
- If a total immersion thermometer is used at partial immersion, apply an emergent stem correction as explained in NISTSP 250-23.
- If the correction is unsigned, it should be added to the thermometer reading. If the correction is preceded by a minus sign, it should be subtracted from the thermometer reading to obtain the true temperature.
- This report shall not be reproduced except in full, without the written approval of Q.C. Services.

Notes: With probe # 240118987

Certified by: Tom M. Laine Jr.
Signatory: [Signature] **Title:** QA **Date:** 9/5/06



Thermometer Certification

Calibration Report

Customer: Vermont Dept. of Health
Make: Fisher
Model: TRACEABLE
Instrument #: 240118616
Test #: T062105-2
Scale Range: -50 TO 150°C in 0.1°C divisions
Partial Immersion
Total Immersion

Date Received: 6/17/05
Service Date: 6/21/05
Recommended Due Date: 6/21/06
PO#: S05-00911
Contact: Steven Harnois
Description: Dig. thermometer w/"k"probe
Condition Received: Good - in case
Standards Used

Description	Serial No.	Due Date	Report No.
Ertco-Eutechnics	302639	2/28/06	5938-0205
Hart PRT 5614	490453	3/31/06	A4313005
Ertco Hart 850C	8B552	3/31/06	A4330052

Thermometer Corrections/Readings °C					
Temp Set	STD	UUT	Deviation	Correction	Uncertainty
0.00	-0.002	0.039	0.041	-0.04	0.09
34.00	34.001	33.973	-0.028	0.03	0.06
50.00	50.010	49.922	-0.088	0.09	0.06
100.00	99.991	99.783	-0.208	0.21	0.06

- Traceability: The standards referenced in this report are traceable to the National Institute of Standards and Technology. Calibrations are performed in accordance with Procedure CAL038 Rev. A & CAL 053 Draft
- All temperatures in this report are based on the (ITS-90) International Scale of 1990.
- Uncertainties reported in accordance with NIST Technical Note 1297 and includes the reported uncertainty of the standards used combined with the uncertainty of the measurement process in the root sum square formula using a coverage factor of K=2 for a confidence level of approximately 95%.
- *The recommended 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 an instruments in-accuracy over time such as drift, environment, transport, frequency of use etc. The reported results reflect readings obtained at the time of test only.
- If a total immersion thermometer is used at partial immersion, apply an emergent stem correction as explained in NIST Monograph 150.
- If the correction is unsigned, it should be added to the thermometer reading. If the correction is preceded by a minus sign, it should be subtracted from the thermometer reading to obtain the true temperature.
- This report shall not be reproduced except in full, without the written approval of Q.C. Services.

Notes: With probe # 240118587

Certified by: Tom McLain

Signatory: Richard [Signature]

Title: QA

Date: 6/27/05



Calibration complies with
ISO 17025

Cert. No. 4000: 452008



Traceable® Certificate of Calibration for Digital Thermometer

Instrument Identification

Model No.15-077-8 S/N 240118616 Manufacturer:Control Company
Probe: 15-077-7 240118587

Standards/Equipment Used	Model	Serial No.	Recall Date	NIST Reference
Thermometrics Temp Probe	ES225	128	6/26/2004	A3617063
Hart Scientific 2563 Module	2563	A27129	7/22/2004	1000153920
Hart Precision Bath	7011	93139		

Certificate Information

As Found: New Instrument Cal Date: 3/6/2004
As Left: In Tolerance Due Date: 3/6/2006
Procedure: CAL-06 Technician: 68

Test Conditions: 24.0°C 40.0 RH 30.09 in Hg

Calibration Data (As Left)

Standard	Reading	Units	Condition
-0.001	-0.001	°C	In Tolerance
24.999	24.998	°C	In Tolerance
60.005	60.000	°C	In Tolerance
99.999	99.993	°C	In Tolerance

Accuracy: ±0.05°C (0 to 100°C)
Expanded Measurement Uncertainty at k=2: ± 0.013°C

This Digital Thermometer was calibrated against National Institute of Standards and Technology Traceable Instrumentation. 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.

Wallace Berry

Wallace Berry, Technical Manager

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Recalibration

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VWR Thermometer
20141253



Thermometer Certification

Calibration Report

RECEIVED

AUG 28 2006

Vermont Department of Health Laboratory

Customer: Vermont Dept. of Health
195 Colchester Ave., Burlington, VT, 05402

Make: VWR
Model: Traceable
Instrument #: 20141253
Test #: T081506-2
Scale Range: 0 ~ 100°C in 0.1° divisions

Partial Immersion
Total Immersion
Other (See Notes)

Date Received: 8/7/2006
Calibration Date: 8/15/2006
Cust. Spec. Due Date*: 8/15/2007
PO#: S07-0086
Contact: Steve Harnois

Description: Dig. Thermometer
Condition Received: Good
Lab Temperature (°C) 19.9 ~ 20.3
Lab Humidity RH% 34 ~ 36
Standards Used

Description	Serial No.	Due Date	Report No.
Hart PRT / Tweener	8B552	2/28/2007	A6123016

Thermometer Corrections/Readings °C					
Temp Set	STD	UUT	Deviation	Correction	(+/-) Uncertainty
0.00	0.002	-0.500	-0.502	0.50	0.10
34.00	34.003	34.500	0.497	-0.50	0.10
50.00	50.003	50.300	0.297	-0.30	0.10
100.00	99.978	100.200	0.222	-0.22	0.10

-Traceability: The standards referenced in this report are traceable to the National Institute of Standards and Technology. Calibrations are performed in accordance with Procedure SOP qcs3015 orig.

-All temperatures in this report are based on the (ITS-90) International Scale of 1990.

-Uncertainties are reported in accordance with NIST Technical Note 1297, and include the uncertainty associated with the standards used (type B), combined with the uncertainty associated with the measurement process (type A), in the root sum square formula using a coverage factor of K=2 for a confidence level of approximately 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 an instruments in-accuracy over time such as drift, environment, transport, frequency of use etc. The reported results reflect readings obtained at the time of test only.

-If a total immersion thermometer is used at partial immersion, apply an emergent stem correction as explained in NISTSP 250-23.

-If the correction is unsigned, it should be added to the thermometer reading. If the correction is preceded by a minus sign, it should be subtracted from the thermometer reading to obtain the true temperature.

-This report shall not be reproduced except in full, without the written approval of Q.C. Services.

Notes:

Certified by: Tom McLain Jr

Signatory: [Signature] Title METROLOGIST Date 8/22/06



Thermometer Certification

Calibration Report

Customer: Vermont Dept. of Health Lab
Make: VWR
Model: TRACEABLE
Instrument #: 20141253
Test #: T061405-2
Scale Range: 0 TO 100°C in 0.1°C divisions

Date Received: 6/10/05
Service Date: 6/14/05
Recommended Due Date: 6/14/06
PO#: S05-00911
Contact: Steve Harnois
Description: Digital Thermometer

Partial Immersion
Total Immersion

Condition Received: Good
Standards Used

Description	Serial No.	Due Date	Report No.
Ertco-Eutechnics	302639	2/28/06	5938-0205
Hart PRT 5614	490453	3/31/06	A4313005
Ertco Hart 850C	8B552	3/31/06	A4330052

Thermometer Corrections/Readings °C					
Temp Set	STD	UUT	Deviation	Correction	Uncertainty
0.00	0.001	-0.500	-0.501	0.50	0.1
34.00	34.022	34.500	0.478	-0.48	0.1
50.00	50.007	50.350	0.343	-0.34	0.1
100.00	99.921	100.200	0.279	-0.28	0.1

- Traceability: The standards referenced in this report are traceable to the National Institute of Standards and Technology. Calibrations are performed in accordance with Procedure CAL038 Rev. A & CAL 053 Draft
- All temperatures in this report are based on the (ITS-90) International Scale of 1990.
- Uncertainties reported in accordance with NIST Technical Note 1297 and includes the reported uncertainty of the standards used combined with the uncertainty of the measurement process in the root sum square formula using a coverage factor of K=2 for a confidence level of approximately 95%.
- *The recommended 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 an instruments in-accuracy over time such as drift, environment, transport, frequency of use etc. The reported results reflect readings obtained at the time of test only.
- If a total immersion thermometer is used at partial immersion, apply an emergent stem correction as explained in NIST Monograph 150.
- If the correction is unsigned, it should be added to the thermometer reading. If the correction is preceded by a minus sign, it should be subtracted from the thermometer reading to obtain the true temperature.
- This report shall not be reproduced except in full, without the written approval of Q.C. Services.

Notes:

Certified by: TOM
Signatory: [Signature]

Title: METROLOGIST **Date:** 6/14/05



Thermometer Certification

Calibration Report

Customer: VERMONT DEPT OF HEALTH
Make: VWR
Model: PEN TYPE
Instrument #: 20141253
Test #: T 030903-4
Scale Range: 0 TO 50°C in 0.1°C divisions

Date Received: 2/26/03
Service Date: 3/7/03
Recommended Due Date: 3/7/04
PO#: S03-0919
Contact: BOB DRAWBAUGH



Partial Immersion
Total Immersion

Description: DIGITAL THERMOMETER
Condition Received: Good

Standards Used

Description	Serial No.	Due Date	Report No.
HART PRT 5614	490453	12/31/03	A1C0330
ERTCO HART 850 C	8B552	12/31/03	A1C1816

Thermometer Corrections/Readings °C					
Temp Set	PRT	UUT	Deviation	Correction	Uncertainty
0.00	-0.002	-0.400	-0.398	0.40	0.08
34.00	34.038	34.700	0.662	-0.66	0.1
50.00	49.992	50.400	0.408	-0.41	0.1
100.00	100.062	100.300	0.239	-0.24	0.1

- Traceability: The standards referenced in this report are traceable to the National Institute of Standards and Technology. Calibrations are performed in accordance with Procedure CAL038 Rev. Orig.
- All temperatures in this report are based on the (ITS-90) International Scale of 1990.
- Uncertainties reported in accordance with NIST Technical Note 1297 and includes the reported uncertainty of the standards used combined with the uncertainty of the measurement process in the root sum square formula using a coverage factor of K=2 for a confidence level of approximately 95%.
- *The recommended 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 an instruments in-accuracy over time such as drift, environment, transport, frequency of use etc. The reported results reflect readings obtained at the time of test only.
- If a total immersion thermometer is used at partial immersion, apply an emergent stem correction as explained in NIST Monograph 150.
- If the correction is unsigned, it should be added to the thermometer reading. If the correction is preceded by a minus sign, it should be subtracted from the thermometer reading to obtain the true temperature.
- This report shall not be reproduced except in full, without the written approval of Q.C. Services.

Notes: NEEDS 5 MINUTES TO STABLIZE

Certified by: Richard Schieferstein

Signatory *Richard Schieferstein*

Title QM

Date 3/9/03

Chickadee Thermometer
U1234070



Thermometer Certification

Calibration Report

Customer: Vermont Dept. of Health
195 Colchester Ave., Burlington, VT, 05402

Make: HANNA	Date Received: 8/7/2006
Model: CHECKTEMP	Calibration Date: 8/15/2006
Instrument #: U1234070	Cust. Spec. Due Date*: 8/15/2007
Test #: T081506-1	PO#: S07-0086
Scale Range: 0. ~ 100°C in 0.1° divisions	Contact: Steve Harnois
Partial Immersion <input checked="" type="checkbox"/>	Description: Dig. Thermometer
Total Immersion <input type="checkbox"/>	Condition Received: Good
Other (See Notes) <input type="checkbox"/>	Lab Temperature (°C) 19.9 ~20.3
	Lab Humidity RH% 34 ~ 36
	Standards Used

Description	Serial No.	Due Date	Report No.
Hart PRT / Tweener	8B552	2/28/2007	A6123016

Thermometer Corrections/Readings °C					
Temp Set	STD	UUT	Deviation	Correction	(+/-) Uncertainty
0.00	0.002	0.200	0.198	-0.20	0.10
34.00	34.003	34.300	0.297	-0.30	0.10
50.00	50.003	50.300	0.297	-0.30	0.10
100.00	99.978	99.600	-0.378	0.38	0.10

- Traceability: The standards referenced in this report are traceable to the National Institute of Standards and Technology. Calibrations are performed in accordance with Procedure SOP qcs3015 orig.
- All temperatures in this report are based on the (ITS-90) International Scale of 1990.
- Uncertainties are reported in accordance with NIST Technical Note 1297, and include the uncertainty associated with the standards used (type B), combined with the uncertainty associated with the measurement process (type A), in the root sum square formula using a coverage factor of K=2 for a confidence level of approximately 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 an instruments in-accuracy over time such as drift, environment, transport, frequency of use etc. The reported results reflect readings obtained at the time of test only.
- If a total immersion thermometer is used at partial immersion, apply an emergent stem correction as explained in NISTSP 250-23.
- If the correction is unsigned, it should be added to the thermometer reading. If the correction is preceded by a minus sign, it should be subtracted from the thermometer reading to obtain the true temperature.
- This report shall not be reproduced except in full, without the written approval of Q.C. Services.

Notes:

Certified by: Tom McLeig Jr

Signatory: [Signature] Title METROLOGIST Date 8/16/06



Thermometer Certification

Calibration Report

Customer: Vermont Dept. of Health
195 Colchester Ave., Burlington, VT, 05402

Make: HANNA
Model: CHECKTEMP
Instrument #: U1234070
Test #: T081506-1
Scale Range: 0. ~ 100°C in 0.1° divisions

Partial Immersion
Total Immersion
Other (See Notes)

Date Received: 8/7/2006
Calibration Date: 8/15/2006
Cust. Spec. Due Date*: 8/15/2007
PO#: S07-0086
Contact: Steve Harnois

Description: Dig. Thermometer
Condition Received: Good
Lab Temperature (°C) 19.9 ~20.3
Lab Humidity RH% 34 ~ 36
Standards Used

Description	Serial No.	Due Date	Report No.
Hart PRT / Tweener	8B552	2/28/2007	A6123016

Thermometer Corrections/Readings °C					
Temp Set	STD	UUT	Deviation	Correction	(+/-) Uncertainty
0.00	0.002	0.200	0.198	-0.20	0.10
34.00	34.003	34.300	0.297	-0.30	0.10
50.00	50.003	50.300	0.297	-0.30	0.10
100.00	99.978	99.600	-0.378	0.38	0.10

-Traceability: The standards referenced in this report are traceable to the National Institute of Standards and Technology. Calibrations are performed in accordance with Procedure SOP qcs3015 orig.

-All temperatures in this report are based on the (ITS-90) International Scale of 1990.

-Uncertainties are reported in accordance with NIST Technical Note 1297, and include the uncertainty associated with the standards used (type B), combined with the uncertainty associated with the measurement process (type A), in the root sum square formula using a coverage factor of K=2 for a confidence level of approximately 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 an instruments in-accuracy over time such as drift, environment, transport, frequency of use etc. The reported results reflect readings obtained at the time of test only.

-If a total immersion thermometer is used at partial immersion, apply an emergent stem correction as explained in NISTSP 250-23.

-If the correction is unsigned, it should be added to the thermometer reading. If the correction is preceded by a minus sign, it should be subtracted from the thermometer reading to obtain the true temperature.

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Notes:

Certified by: Tom McChain Jr.

Signatory: [Signature] Title METROLOGIST Date 8/16/06



Thermometer Certification

Calibration Report

Customer: Vermont Dept. of Health Lab
Make: HANNA
Model: Checktemp
Instrument #: U1234070
Test #: T061405-1
Scale Range: 0 TO 100°C in 0.1°C divisions

Date Received: 6/10/05
Service Date: 6/14/05
Recommended Due Date: 6/14/06
PO#: S05-00911
Contact: Steve Harnois

Partial Immersion
Total Immersion

Description: Digital Thermometer
Condition Received: Good
Standards Used

Description	Serial No.	Due Date	Report No.
Ertco-Eutechnics	302639	2/28/06	5938-0205
Hart PRT 5614	490453	3/31/06	A4313005
Ertco Hart 850C	8B552	3/31/06	A4330052

Thermometer Corrections/Readings °C					
Temp Set	STD	UUT	Deviation	Correction	Uncertainty
0.00	0.001	0.000	-0.001	0.00	0.1
34.00	34.022	34.200	0.178	-0.18	0.1
50.00	50.007	50.100	0.093	-0.09	0.1
100.00	99.921	99.600	-0.321	0.32	0.1

- Traceability: The standards referenced in this report are traceable to the National Institute of Standards and Technology. Calibrations are performed in accordance with Procedure CAL038 Rev. A & CAL 053 Draft
- All temperatures in this report are based on the (ITS-90) International Scale of 1990.
- Uncertainties reported in accordance with NIST Technical Note 1297 and includes the reported uncertainty of the standards used combined with the uncertainty of the measurement process in the root sum square formula using a coverage factor of K=2 for a confidence level of approximately 95%.
- *The recommended 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 an instruments in-accuracy over time such as drift, environment, transport, frequency of use etc. The reported results reflect readings obtained at the time of test only.
- If a total immersion thermometer is used at partial immersion, apply an emergent stem correction as explained in NIST Monograph 150.
- If the correction is unsigned, it should be added to the thermometer reading. If the correction is preceded by a minus sign, it should be subtracted from the thermometer reading to obtain the true temperature.
- This report shall not be reproduced except in full, without the written approval of Q.C. Services.

Notes:

Certified by: TOM
 Signatory: [Signature]

Title **METROLOGIST** Date **6/14/05**
 QCS# 2016 rev.E 1/24/05



Thermometer Certification

Calibration Report

Customer: VERMONT DEPT OF HEALTH
Make: HANNA
Model: CHECKTEMP
Instrument #: U1234070
Test #: T 040303-4
Scale Range: 0 TO 100°C in 0.1°C divisions

Date Received: 3/27/03
Service Date: 4/3/03
Recommended Due Date: 4/3/04
PO#: S03-1060
Contact: STEVEN HARNOIS



Partial Immersion
Total Immersion

Description: DIGITAL THERMOMETER
Condition Received: Good
Standards Used

Description	Serial No.	Due Date	Report No.
HART PRT 5614	490453	12/31/03	A1C0330
ERTCO HART 850 C	8B552	12/31/03	A1C1816

Thermometer Corrections/Readings °C					
Temp Set	PRT	UUT	Deviation	Correction	Uncertainty
0.00	-0.002	0.000	0.002	0.00	0.08
34.00	34.046	34.200	0.154	-0.15	0.1
50.00	49.978	50.100	0.122	-0.12	0.1
100.00	99.991	99.750	-0.241	0.24	0.1

- Traceability: The standards referenced in this report are traceable to the National Institute of Standards and Technology. Calibrations are performed in accordance with Procedure CAL038 Rev. Orig.
- All temperatures in this report are based on the (ITS-90) International Scale of 1990.
- Uncertainties reported in accordance with NIST Technical Note 1297 and includes the reported uncertainty of the standards used combined with the uncertainty of the measurement process in the root sum square formula using a coverage factor of K=2 for a confidence level of approximately 95%.
- *The recommended 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 an instruments in-accuracy over time such as drift, environment, transport, frequency of use etc. The reported results reflect readings obtained at the time of test only.
- If a total immersion thermometer is used at partial immersion, apply an emergent stem correction as explained in NIST Monograph 150.
- If the correction is unsigned, it should be added to the thermometer reading. If the correction is preceded by a minus sign, it should be subtracted from the thermometer reading to obtain the true temperature.
- This report shall not be reproduced except in full, without the written approval of Q.C. Services.

Notes:

Certified by: Richard Schieferstein

Signatory *Richard Schieferstein*

Title QM

Date 4/4/03

Fisher
99223379



Thermometer Certification

Calibration Report

Customer: Vt. Dept. of Health, Public Health lab
195 Colchester Ave., Burlington, VT, 05402

Make: Fisher	Date Received: 8/30/2006
Model: TRACEABLE	Calibration Date: 9/5/2006
Instrument #: 99223379	Cust. Spec. Due Date*: 9/30/2007
Test #: T090506-3	PO#: S07-0086
Scale Range: -5 ~ 150°C in 0.1° divisions	Contact: Steve Harnois
Partial Immersion <input checked="" type="checkbox"/>	Description: Dig. Thermometer
Total Immersion <input type="checkbox"/>	Condition Received: Good
Other (See Notes) <input type="checkbox"/>	Lab Temperature (°C) 19.5 ~20.7
	Lab Humidity RH% 46 ~ 50
	Standards Used

Description	Serial No.	Due Date	Report No.
Hart PRT / Tweener	88552	2/28/2007	A6123016

Thermometer Corrections/Readings °C					
Temp Set	STD	UUT	Deviation	Correction	(+/-) Uncertainty
0.00	-0.010	-1.000	-0.990	0.99	0.10
34.00	33.999	34.000	0.001	0.00	0.10
50.00	50.006	49.800	-0.206	0.21	0.10
100.00	99.970	99.600	-0.370	0.37	0.10

- Traceability: The standards referenced in this report are traceable to the National Institute of Standards and Technology. Calibrations are performed in accordance with Procedure SOP qcs3015 orig.
- All temperatures in this report are based on the (ITS-90) International Scale of 1990.
- Uncertainties are reported in accordance with NIST Technical Note 1297, and include the uncertainty associated with the standards used (type B), combined with the uncertainty associated with the measurement process (type A), in the root sum square formula using a coverage factor of K=2 for a confidence level of approximately 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 an instruments in-accuracy over time such as drift, environment, transport, frequency of use etc. The reported results reflect readings obtained at the time of test only.
- If a total immersion thermometer is used at partial immersion, apply an emergent stem correction as explained in NISTSP 250-23.
- If the correction is unsigned, it should be added to the thermometer reading. If the correction is preceded by a minus sign, it should be subtracted from the thermometer reading to obtain the true temperature.
- This report shall not be reproduced except in full, without the written approval of Q.C. Services.

Notes:

Certified by: Tom McKain Jr.

Signatory Richard Schupert **Title** QA **Date** 9/5/06



Thermometer Certification

Calibration Report

Customer: Vermont Dept. of Health
Make: Fisher
Model: TRACEABLE
Instrument #: 99223379
Test #: T062105-1
Scale Range: -50 TO 150°C in 0.1°C divisions

Date Received: 6/17/05
Service Date: 6/21/05
Recommended Due Date: 6/21/06
PO#: S05-00911
Contact: Steven Harnois
Description: PARTIAL-IMMERSION THERMOMETER

Partial Immersion
Total Immersion

Condition Received: Good

Standards Used

Description	Serial No.	Due Date	Report No.
Ertco-Eutechnics	302639	2/28/06	5938-0205
Hart PRT 5614	490453	3/31/06	A4313005
Ertco Hart 850C	8B552	3/31/06	A4330052

Thermometer Corrections/Readings °C					
Temp Set	STD	UUT	Deviation	Correction	Uncertainty
0.00	-0.002	-1.000	-0.998	1.00	0.1
34.00	34.001	34.000	-0.001	0.00	0.1
50.00	50.010	49.800	-0.210	0.21	0.1
100.00	99.991	99.600	-0.391	0.39	0.1

- Traceability: The standards referenced in this report are traceable to the National Institute of Standards and Technology. Calibrations are performed in accordance with Procedure CAL038 Rev. A & CAL 053 Draft
- All temperatures in this report are based on the (ITS-90) International Scale of 1990.
- Uncertainties reported in accordance with NIST Technical Note 1297 and includes the reported uncertainty of the standards used combined with the uncertainty of the measurement process in the root sum square formula using a coverage factor of K=2 for a confidence level of approximately 95%.
- *The recommended 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 an instruments in-accuracy over time such as drift, environment, transport, frequency of use etc. The reported results reflect readings obtained at the time of test only.
- If a total immersion thermometer is used at partial immersion, apply an emergent stem correction as explained in NIST Monograph 150.
- If the correction is unsigned, it should be added to the thermometer reading. If the correction is preceded by a minus sign, it should be subtracted from the thermometer reading to obtain the true temperature.
- This report shall not be reproduced except in full, without the written approval of Q.C. Services.

Notes:

Certified by: Tom McLain

Signatory Richard [Signature]

Title QA

Date 6/22/05



Thermometer Certification

Calibration Report

Customer: VERMONT DEPT OF HEALTH
Make: CONTROL CO
Model: UN-KNOWN
Instrument #: 99223379
Test #: T 040303-3
Scale Range: 0 TO 100°C in 0.1°C divisions

Date Received: 3/27/03
Service Date: 4/3/03
Recommended Due Date: 4/3/04
PO#: S03-1060
Contact: STEVEN HARNOIS



Partial Immersion
Total Immersion

Description: DIGITAL THERMOMETER
Condition Received: Good

Standards Used

Description	Serial No.	Due Date	Report No.
HART PRT 5614	490453	12/31/03	A1C0330
ERTCO HART 850 C	8B552	12/31/03	A1C1816

Thermometer Corrections/Readings °C					
Temp Set	PRT	UUT	Deviation	Correction	Uncertainty
0.00	-0.002	-0.900	-0.898	0.90	0.08
34.00	34.046	34.100	0.054	-0.05	0.1
50.00	49.978	49.800	-0.178	0.18	0.1
100.00	99.991	99.600	-0.391	0.39	0.1

- Traceability: The standards referenced in this report are traceable to the National Institute of Standards and Technology. Calibrations are performed in accordance with Procedure CAL038 Rev. Orig.
- All temperatures in this report are based on the (ITS-90) International Scale of 1990.
- Uncertainties reported in accordance with NIST Technical Note 1297 and includes the reported uncertainty of the standards used combined with the uncertainty of the measurement process in the root sum square formula using a coverage factor of K=2 for a confidence level of approximately 95%.
- *The recommended 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 an instruments in-accuracy over time such as drift, environment, transport, frequency of use etc. The reported results reflect readings obtained at the time of test only.
- If a total immersion thermometer is used at partial immersion, apply an emergent stem correction as explained in NIST Monograph 150.
- If the correction is unsigned, it should be added to the thermometer reading. If the correction is preceded by a minus sign, it should be subtracted from the thermometer reading to obtain the true temperature.
- This report shall not be reproduced except in full, without the written approval of Q.C. Services.

Notes:

Certified by: Richard Schieferstein

Signatory

Richard Schieferstein Title *QM*

Date

4/3/04

Flike DMM
70631030



Certificate of Calibration



Worldwide Support Center

1420 75th Street S.W.
Everett, WA 98203 USA
Phone : (888) 993-5853
Fax: (425) 446-6390

CalNet®

Manufacturer: FLUKE
Model: 87 III
Description: TRUE RMS MULTIMETER
Asset Number: 70631030
Serial Number: 70631030

The Fluke Corporation, ISO Certification No. U0018, certifies that the instrument identified above was calibrated in accordance with applicable Fluke calibration procedures. Its calibration processes are ISO-9001 controlled and are designed to certify that the instrument was within its published specifications at the time of calibration.

The measurement standards and instruments used during the calibration of this instrument are traceable to the United States National Institute of Standards and Technology (NIST), natural physical constants, consensus standards, or by ratio type measurements.

CALIBRATION INFORMATION

Cal Date:	07-Jul-2005	Temperature	23°C	Calibration Report Number:	616620-70631030:1120731106
Next Cal Due:	07-Jul-2006	Humidity	40 %	Technician#:	59430
				Technician:	Long Le
				Test Result:	PASS

Remarks:

Calibration Procedure MFG MANUAL

Revision JUN-02

STANDARDS USED FOR CALIBRATION

Asset Number	Manufacturer	Model	Description	Cal. Date	Due Date
10127	FLUKE	5520A	CALIBRATOR	24 Feb 2005	24 Aug 2005

End of Report



Calibration Certificate

Description:	TRUE RMS MULTIMETER	Certificate Number:	616620-70631030:1156152387
Manufacturer:	FLUKE	Date of Calibration:	21 August 2006
Model:	87 III	Date of Certificate:	21 August 2006
Serial Number:	70631030	Date Due:	21 August 2007
Customer Name:	STATE OF VERMONT	Procedure Name:	MFG MANUAL
City, State:	BURLINGTON, VT	Procedure Revision:	JUN-02
Customer Item ID:	70631030	Data Type:	FOUND-LEFT
PO Number:	S07-0085	Temperature:	23 ± 3.0 °Celsius
RMA Number:	3518882	Relative Humidity:	25% ≤ RH ≤ 60%
		Test Result:	PASS

The Fluke Corporation, NQA ISO 9001:2000 ISO Certification No. 10100/2, certifies that the instrument identified above was calibrated in accordance with applicable Fluke calibration procedures. Its calibration processes are ISO-9001 controlled and are designed to certify that the instrument was within its published specifications at the time of calibration.

The measurement standards and instruments used during the calibration of this instrument are traceable to the United States National Institute of Standards and Technology (NIST), other reputable National Institutes, natural physical constants, consensus standards, or by ratio type measurements.

This certificate applies to only the item identified and shall not be reproduced other than in full, without the specific written approval by Fluke Corporation. The user is obliged to have the in object recalibrated at appropriate intervals. Calibration Certificates without signature are not valid.

The Data type that could be found in this certificate is interpreted as follows:

- As Found — The unit needed adjustment and/or repair.
- As Left — The unit was adjusted and/or repaired.
- As Found/ As Left — The unit was calibrated without any adjustment and/or repair performed.

Comments:

Long Le

Metrology Technician

FLUKE ®

Certificate Number:
616620-70631030:1156152387

Calibration Date:
21-Aug-06

Standards Used

Asset #	Instrument Model	Cal Date	Cal Due
10127	FLUKE 5520A CALIBRATOR	29 June 2006	29 March 2007

End of Report



Calibration Certificate

Description:	TRUE RMS MULTIMETER	Certificate Number:	616620-70631030:1192439016
Manufacturer:	FLUKE	Date of Calibration:	15 October 2007
Model:	87 III	Date of Certificate:	15 October 2007
Serial Number:	70631030	Date Due:	15 October 2008
Customer Name:	STATE OF VERMONT	Procedure Name:	MFG MANUAL
City, State:	BURLINGTON, VT	Procedure Revision:	JUN-02
Customer Item ID:	70631030	Data Type:	FOUND-LEFT
PO Number:	S08-0359	Temperature:	23 ± 3.0 °Celsius
RMA Number:	3799121	Relative Humidity:	25% ≤ RH ≤ 60%
		Test Result:	PASS

The Fluke Corporation, NQA ISO 9001:2000 ISO Certification No. 10100/2, certifies that the instrument identified above was calibrated in accordance with applicable Fluke calibration procedures. Its calibration processes are ISO-9001 controlled and are designed to certify that the instrument was within its published specifications at the time of calibration.

The measurement standards and instruments used during the calibration of this instrument are traceable to the United States National Institute of Standards and Technology (NIST), other reputable National Institutes, natural physical constants, consensus standards, or by ratio type measurements.

This certificate applies to only the item identified and shall not be reproduced other than in full, without the specific written approval by Fluke Corporation. The user is obliged to have the in object recalibrated at appropriate intervals. Calibration Certificates without signature are not valid.

The Data type that could be found in this certificate is interpreted as follows:

- As Found — The unit needed adjustment and/or repair.
- As Left — The unit was adjusted and/or repaired.
- As Found/ As Left — The unit was calibrated without any adjustment and/or repair performed.

Comments:

Long Le
Metrology Technician

FLUKE ®Certificate Number:
616620-70631030:1192439016Calibration Date:
15-Oct-07**Standards Used**

Asset #	Instrument Model	Cal Date	Cal Due
10127	FLUKE 5520A CALIBRATOR	27 February 2007	27 November 2007

End of Report

1420 75th St. SW
Everett, Washington 98203
USA

NQA ISO 9000:2000 (10100/2)

Calibration Certificate

Description:	TRUE RMS MULTIMETER	Certificate Number:	616620-70631030:1233816377
Manufacturer:	FLUKE	Date of Calibration:	05 February 2009
Model:	87 III	Date of Certificate:	05 February 2009
Serial Number:	70631030	Date Due:	05 February 2010
Customer Name:		Procedure Name:	
STATE OF VERMONT		MFG MANUAL	
City, State:	BURLINGTON, VT	Procedure Revision:	JUN-02
Customer Item ID:	70631030	Data Type:	FOUND-LEFT
PO Number:	S090506	Temperature:	23.00 °Celsius
RMA Number:	4077767	Relative Humidity:	40 %
Result Summary:	PASS		

The Data type that could be found in this certificate must be interpreted as:

- As-Found - Calibration data collected before the unit is adjusted and/or repaired.
- As-Left - Calibration data collected after the unit is adjusted and/or repaired.
- Found-Left - Calibration data collected without any adjustment and/or repair performed.

This certificate applies only to the item identified and shall not be reproduced other than in full, without the specific written approval by Fluke Corporation. The user is obliged to have the object recalibrated at appropriate intervals.

Comments:

Long Le

Metrology Technician

Traceability Information

For each parameter listed below the calibration was conducted using an unbroken chain of standards to:

DC Voltage

The Voltage Reference standard group, traceable to the Fluke Primary Standards Laboratory, which is traceable to the U.S. representation of the volt, through the internationally accepted value of the Josephson constant $K_j=483597.9$ GHz/V and a 10 Volt Josephson Array Voltage Standard.

Frequency and Period

The GPS-Rubidium Disciplined oscillator frequency standard, traceable to the United States Naval Observatory (USNO), which is traceable to the National Institute of Standards and Technology.

AC Voltage, Resistance, DC Current, AC Current, Capacitance, Inductance, Phase

The Fluke Primary Standards Laboratory, which is traceable to the National Institute of Standards and Technology.

AC Voltage Flatness

The Fluke Primary Standards Laboratory, or Agilent Technologies Standards Laboratory which are traceable to the National Institute of Standards and Technology.

Humidity

The Vaisala Measurement Standards Laboratory Primary Salt calibration bath, with traceability based on the physical phenomena in which the equilibrium relative humidity values associated with certain saturated salt solutions are known.

Rise Time

The Tektronix GmbH Calibration Laboratory which is traceable to the Physikalisch-Technische Bundesanstalt.

Radiation Temperature

The National Institute of Standards and Technology, the Physikalisch-Technische Bundesanstalt, or Hart Scientific.

Contact Temperature

The Fluke Primary Standards Laboratory, Hart Scientific, which are traceable to the National Institute of Standards and Technology.

Gas Flow

The DHI Calibration Laboratory, which is traceable to the National Institute of Standards and Technology.

Pressure

The DHI Calibration Laboratory, which is traceable to the Laboratoire National D'Essais, Physikalisch-Technische Bundesanstalt and National Institute of Standards and Technology, or traceable to the Mensor or Ashcroft Calibration Laboratories, which are traceable to the National Institute of Standards and Technology.

Standards Used

Asset #	Instrument Model	Cal Date	Cal Due
10127	FLUKE 5520A CALIBRATOR	28 August 2008	28 May 2009

End of Report



Calibration Certificate

Description:	TRUE RMS MULTIMETER	Certificate Number:	616620-70631030:1277178465
Manufacturer:	FLUKE	Date of Calibration:	22 June 2010
Model:	87 III	Date of Certificate:	22 June 2010
Serial Number:	70631030	Recommended Due Date:	22 June 2011
Customer Name:	STATE OF VERMONT	Procedure Name:	MFG MANUAL
City, State:	BURLINGTON, VT	Procedure Revision:	JUN-02
Customer Item ID:	70631030	Data Type:	FOUND-LEFT
PO Number:	S10-1097	Temperature:	23.00 °Celsius
RMA Number:	4499767	Relative Humidity:	40 %
Result Summary:	PASS		
Received Date:			

The Data type that could be found in this certificate must be interpreted as:

- As-Found - Calibration data collected before the unit is adjusted and/or repaired.
- As-Left - Calibration data collected after the unit is adjusted and/or repaired.
- Found-Left - Calibration data collected without any adjustment and/or repair performed.

This certificate applies only to the item identified and shall not be reproduced other than in full, without the specific written approval by Fluke Corporation. The user is obliged to have the object recalibrated at appropriate intervals.

Comments:

Long Le
Metrology Technician

Traceability information

For each parameter listed below the calibration was conducted using an unbroken chain of standards to:

DC Voltage

The Voltage Reference standard group, traceable to the Fluke Primary Standards Laboratory, which is traceable to the U.S. representation of the volt, through the internationally accepted value of the Josephson constant $K_J=483597.9$ GHz/V and a 10 Volt Josephson Array Voltage Standard.

Frequency and Period

The GPS-Rubidium Disciplined oscillator frequency standard, traceable to the United States Naval Observatory (USNO), which is traceable to the National Institute of Standards and Technology.

AC Voltage, Resistance, DC Current, AC Current, Capacitance, Inductance, Phase

The Fluke Primary Standards Laboratory, which is traceable to the National Institute of Standards and Technology.

AC Voltage Flatness

The Fluke Primary Standards Laboratory, or Agilent Technologies Standards Laboratory which are traceable to the National Institute of Standards and Technology.

Humidity

The Vaisala Measurement Standards Laboratory Primary Salt calibration bath, with traceability based on the physical phenomena in which the equilibrium relative humidity values associated with certain saturated salt solutions are known.

Rise Time

The Tektronix GmbH Calibration Laboratory which is traceable to the Physikalisch-Technische Bundesanstalt.

Radiation Temperature

The National Institute of Standards and Technology, the Physikalisch-Technische Bundesanstalt, or Hart Scientific.

Contact Temperature

The Fluke Primary Standards Laboratory, Hart Scientific, which are traceable to the National Institute of Standards and Technology.

Gas Flow

The DHI Calibration Laboratory, which is traceable to the National Institute of Standards and Technology.

Pressure

The DHI Calibration Laboratory, which is traceable to the Laboratoire National D'Essais, Physikalisch-Technische Bundesanstalt and National Institute of Standards and Technology, or traceable to the Mensor or Ashcroft Calibration Laboratories, which are traceable to the National Institute of Standards and Technology.

Standards Used

Asset #	Instrument Model	Cal Date	Cal Due
10127	FLUKE 5520A CALIBRATOR	01 June 2010	01 March 2011

End of Report

FLUKE ®

Everett Service Center

1420 75th St. SW
Everett, Washington 98203
USA**Calibration Certificate**

NQA ISO 9001:2008 (10100/2)

Description:	TRUE RMS MULTIMETER	Certificate Number:	616620-70631030:1310556982
Manufacturer:	FLUKE	Date of Calibration:	13 July 2011
Model:	87 III	Date of Certificate:	13 July 2011
Serial Number:	70631030	Recommended Due Date:	13 July 2012
Customer Name:	STATE OF VERMONT	Procedure Name:	FLUKE 87 III:(1 YEAR)CAL VER/ALT 5520A
City, State:	BURLINGTON, VT	Procedure Revision:	1.0
Customer Item ID:	70631030	Data Type:	FOUND-LEFT
PO Number:	S11-1010	Temperature:	23.9 °Celsius
RMA Number:	4781577	Relative Humidity:	44 %
Result Summary:	PASS		
Received Date:	05 July 2011		

In the attached measurement results, deviation may be expressed with units, Measured Value (MV) - Nominal Value (NV) or as a proportion of the nominal value $((MV-NV)/NV)$, expressed without units with a scalar multiplier such as % (0.01), or as a ratio of the units (mA/A, $\mu V/V$, etc.) Descriptions such as $\mu A/A$, $\mu V/V$, and others, where used to annotate results or column headings are the preferred replacements for what was historically labeled as "ppm" or parts-per-million and described the results in that column, unless otherwise noted by units symbols.

Measurement uncertainties at the time of test are given in the following pages, where applicable. They are calculated in accordance with the method described in NIST TN1297, for a confidence level of approximately 95% using a coverage factor of approximately 2 (K=2).

The Data type that could be found in this certificate must be interpreted as:

- As-Found - Calibration data collected before the unit is adjusted and/or repaired.
- As-Left - Calibration data collected after the unit is adjusted and/or repaired.
- Found-Left - Calibration data collected without any adjustment and/or repair performed.

Unless otherwise stated the TUR (Test Uncertainty Ratio) of this calibration is 4:1 or greater.

This Calibration conforms to ANSI/NCSL Z540.1-1994(R2002)

Results are reviewed to establish where any measurement results exceeded the manufacturer's specifications.
Measured values greater than the Manufacturer's specification (Spec) are indicated by "!".

This certificate applies only to the item identified and shall not be reproduced other than in full, without the specific written approval by Fluke Corporation. The user is obliged to have the object recalibrated at appropriate intervals. Calibration certificates without signature are not valid.

Comments:Hai La
Metrology TechnicianRandy Lemon
Lead Metrologist

Traceability Information

For each parameter listed below the calibration was conducted using an unbroken chain of standards to:

DC Voltage

The Voltage Reference standard group, traceable to the Fluke Primary Electrical Standards Laboratory, which is traceable to the U.S. representation of the volt, through the internationally accepted value of the Josephson constant $K_j=483597.9$ GHz/V and a 10 Volt Josephson Array Voltage Standard.

Frequency and Period

A GPS Disciplined Rubidium oscillator frequency standard which is traceable to the National Institute of Standards and Technology (NIST).

AC Voltage, Resistance, DC Current, AC Current, Capacitance, Inductance, Phase

The Fluke Primary Electrical Standards Laboratory, or NRC, or Agilent Technologies Standards Laboratory, or IET, which are traceable to NIST.

AC Voltage Flatness

The Fluke Primary Electrical Standards Laboratory or Agilent Technologies Standards Laboratory, or PTB, or NPL, which are traceable to NIST.

Humidity

The Vaisala Measurement Standards Laboratory Primary Salt calibration bath, with traceability based on the physical phenomena in which the equilibrium relative humidity values associated with certain saturated salt solutions are known.

Rise Time

The Tektronix GmbH Calibration Laboratory which is traceable to the Physikalisch-Technische Bundesanstalt (PTB), and the National Physical Laboratory (NPL).

Radiation Temperature

Traceable to NIST, PTB, and the Fluke Primary Temperature Standards Laboratory.

Contact Temperature

Traceable to the Fluke Primary Temperature Standards Laboratory which is traceable to the NIST.

Gas Flow

The Fluke Primary Gas Flow Laboratory which is traceable to the NIST.

Pressure

The Fluke Primary Pressure Laboratory (Phoenix), which is traceable to the Laboratoire National de Metrologie et D'Essais (LNE) and PTB.

Standards Used

Asset #	Instrument Model	Cal Date	Cal Due
13607	FLUKE 5520A CALIBRATOR	30 March 2011	30 March 2012

Calibration Results

Function/Range	Nominal Value	Measured Value	TUR	Manufacturer's Specifications	
				Lower Limit	Upper Limit
DISPLAY TEST					
Result of Operator Evaluation		PASS			
ROTARY SWITCH TEST					
Result of Operator Evaluation		PASS			
RESISTANCE TEST					
400 Ohm Range					
190.0 Ohm	190.00	189.9		189.4	190.6
40k Ohm Range					
19.00 kOhm	19.000	19.01		18.95	19.05
4M Ohm Range					
1.900 MOhm	1.9000	1.900		1.888	1.912
40M Ohm Range					
19.00 MOhm	19.000	19.00		18.78	19.22

Calibration Results

Function/Range	Nominal Value	Measured Value	TUR	Manufacturer's Specifications	
				Lower Limit	Upper Limit
CONDUCTANCE TEST					
40nS Range					
10.00 nS	10.000	10.02		9.80	10.20
DIODE TEST					
3.000 V	3.0000	2.995		2.939	3.061
AC VOLTAGE TEST					
400 mV Range					
350.0 mV @ 60 Hz	350.00	348.9		347.1	352.9
350.0 mV @ 1 kHz	350.00	348.6		346.1	353.9
350.0 mV @ 5 kHz	350.00	347.2		342.6	357.4
350.0 mV @ 20 kHz	350.00	348.2		341.0	359.0
4 Volt Range					
3.500 V @ 60 Hz	3.5000	3.490		3.473	3.527
3.500 V @ 1 kHz	3.5000	3.487		3.461	3.539
3.500 V @ 5 kHz	3.5000	3.471		3.426	3.574
3.500 V @ 20 kHz	3.5000	3.479		3.410	3.590
40 Volt Range					
35.00 V @ 60 Hz	35.000	34.90		34.73	35.27
35.00 V @ 1 kHz	35.000	34.97		34.61	35.39
35.00 V @ 5 kHz	35.000	35.02		34.26	35.74
35.00 V @ 20 kHz	35.000	34.98		34.10	35.90
400 Volt Range					
350.0 V @ 60 Hz	350.00	349.0		347.3	352.7
350.0 V @ 1 kHz	350.00	349.5		346.1	353.9
350.0 V @ 2.5 kHz	350.00	349.4		342.6	357.4
1000 Volt Range					
900 V @ 60 Hz	900.0	903		892	908
900 V @ 1 kHz	900.0	903		887	913
1-MS MIN MAX TEST					
2.828 V	2.8280	2.800		2.705	2.951
-2.828 V	-2.8280	-2.804		-2.951	-2.705
DC VOLTAGE TEST					
4 Volt Range					
3.500 V	3.5000	3.499		3.497	3.503
40 Volt Range					
35.00 V	35.000	34.99		34.97	35.03
-35.00 V	-35.000	-34.98		-35.03	-34.97
400 Volt Range					
350.0 V	350.00	349.9		349.7	350.3
1000 Volt Range					
1000 V	1000.0	1000		998	1002

Calibration Results

Function/Range	Nominal Value	Measured Value	TUR	Manufacturer's Specifications	
				Lower Limit	Upper Limit
350.0 mV	350.00	349.8		349.5	350.5
DC MILLIAMP TEST					
40mA Range					
35.00 mA	35.000	34.96		34.89	35.11
400mA Range					
350.0 mA	350.00	349.4		349.1	350.9
AC MILLIAMP TEST					
40mA Range					
35.00 mA @ 60 Hz	35.000	34.90		34.63	35.37
35.00 mA @ 1 kHz	35.000	34.95		34.63	35.37
400mA Range					
350.0 mA @ 60 Hz	350.00	349.1		346.3	353.7
350.0 mA @ 1 kHz	350.00	349.5		346.3	353.7
DC MICROAMP TEST					
400uA Range					
350.0 µA	350.00	349.9		348.9	351.1
4000uA Range					
3500 µA	3500.0	3497		3491	3509
AC MICROAMP TEST					
400uA Range					
350.0 µA @ 60 Hz	350.00	349.2		346.3	353.7
350.0 µA @ 1 kHz	350.00	349.8		346.3	353.7
4000uA Range					
3500 µA @ 60 Hz	3500.0	3493		3463	3537
3500 µA @ 1 kHz	3500.0	3498		3463	3537
DC HIGH CURRENT TESTS					
4000mA Range					
3500 mA	3500.0	3496		3489	3511
10A Range					
10.00 A	10.000	9.97		9.96	10.04
AC HIGH CURRENT TESTS					
4000mA Range					
3500 mA @ 60 Hz	3500.0	3488		3463	3537
3500 mA @ 1 kHz	3500.0	3496		3463	3537
10A Range					
10.00 A @ 60 Hz	10.000	10.01		9.88	10.12
10.00 A @ 1 kHz	10.000	10.03		9.88	10.12
FREQUENCY TEST					
19.000 kHz @ 150 mV	19.0000	18.999		18.998	19.002
190.00 kHz @ 150 mV	190.000	189.99		189.98	190.02

FREQUENCY SENSITIVITY and TRIGGER LEVEL TEST

4V Range Sensitivity - AC Coupled

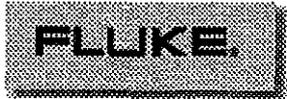
Calibration Results

Function/Range	Nominal Value	Measured Value	TUR	Manufacturer's Specifications	
				Lower Limit	Upper Limit
1000.0 Hz @ 300 mV	1000.00	999.9		999.8	1000.2
4V Range Sensitivity - DC Coupled					
1000.0 Hz @ 1.7 V	1000.00	1000.0		999.8	1000.2
0.0 Hz @ 1.0 V	0.0	0.00		-0.10	0.10
40V Range Sensitivity - DC Coupled					
1000.0 Hz @ 6.0 V	1000.00	1000.0		999.8	1000.2
0.0 Hz @ 2.0 V	0.0	0.00		-0.10	0.10
CAPACITANCE TEST					
5nF Range					
4.70 nF	4.700	4.74	3.54	4.62	4.78
0.05uF Range					
0.0470 μ F	0.04700	0.0469	3.54	0.0462	0.0478
0.5uF Range					
0.470 μ F	0.4700	0.470	3.54	0.462	0.478
1uF Range					
1.00 μ F	1.000	1.00		0.95	1.05

End of Report



Certificate of Calibration



Worldwide Support Center

1420 75th Street S.W.
Everett, WA 98203 USA
Phone: (425) 446 5560
Fax : (425) 446 6390

CalNet®

Manufacturer: FLUKE
Model: FLUKE-87 III
Description: TRUE RMS MULTIMETER
Asset Number: 70631029
Serial Number: 70631029

The Fluke Corporation, ISO Certification No. U0018, certifies that the instrument identified above was calibrated in accordance with applicable Fluke calibration procedures. Its calibration processes are ISO-9001 controlled and are designed to certify that the instrument was within its published specifications at the time of calibration.

The measurement standards and instruments used during the calibration of this instrument are traceable to the United States National Institute of Standards and Technology (NIST), natural physical constants, consensus standards, or by ratio type measurements.

CALIBRATION INFORMATION

Cal Date: 07-Mar-2003 **Temperature:** 23°C **Calibration Report Number:** 616620-70631029
Next Cal Due: 07-Mar-2004 **Humidity:** 33 % **Technician#** 59430
Technician: Long Le

Remarks:

Calibration Procedure: MFG MANUAL **Revision:** JUN-02

STANDARDS USED FOR CALIBRATION

Asset	Manufacturer	Model	Description	Cal Date	Due Date
10054	FLUKE	5500A	CALIBRATOR	22-Jan-2003	22-Jan-2004
7594	FLUKE	CAPSET(4)	CAPACITOR SET	24-Jul-2002	24-Jul-2003

End of Report



Certificate of Calibration



Worldwide Support Center

1420 75th Street S.W.
Everett, WA 98203 USA
Phone : (888) 993-5853
Fax: (425) 446-6390

CalNet®

Manufacturer: FLUKE
Model: 87 III
Description: TRUE RMS MULTIMETER
Asset Number: 70631029
Serial Number: 70631029

The Fluke Corporation, ISO Certification No. U0018, certifies that the instrument identified above was calibrated in accordance with applicable Fluke calibration procedures. Its calibration processes are ISO-9001 controlled and are designed to certify that the instrument was within its published specifications at the time of calibration.

The measurement standards and instruments used during the calibration of this instrument are traceable to the United States National Institute of Standards and Technology (NIST), natural physical constants, consensus standards, or by ratio type measurements.

CALIBRATION INFORMATION

Cal Date:	20-Jun-2005	Temperature	23°C	Calibration Report Number:	616620-70631029:1119257536
Next Cal Due:	20-Jun-2006	Humidity	40 %	Technician#:	59430
				Technician:	Long Le
				Test Result:	PASS

Remarks:

Calibration Procedure MFG MANUAL

Revision JUN-02

STANDARDS USED FOR CALIBRATION

Asset Number	Manufacturer	Model	Description	Cal. Date	Due Date
10127	FLUKE	5520A	CALIBRATOR	24 Feb 2005	24 Aug 2005

End of Report



Calibration Certificate

Description:	TRUE RMS MULTIMETER	Certificate Number:	616620-70631029:1157546674
Manufacturer:	FLUKE	Date of Calibration:	06 September 2006
Model:	87 III	Date of Certificate:	06 September 2006
Serial Number:	70631029	Date Due:	06 September 2007
Customer Name:	STATE OF VERMONT	Procedure Name:	MFG MANUAL
City, State:	BURLINGTON, VT	Procedure Revision:	JUN-02
Customer Item ID:	70631029	Data Type:	FOUND-LEFT
PO Number:	S07-0085	Temperature:	23 ± 3.0 °Celsius
RMA Number:	3518882	Relative Humidity:	25% ≤ RH ≤ 60%
		Test Result:	PASS

The Fluke Corporation, NQA ISO 9001:2000 ISO Certification No. 10100/2, certifies that the instrument identified above was calibrated in accordance with applicable Fluke calibration procedures. Its calibration processes are ISO-9001 controlled and are designed to certify that the instrument was within its published specifications at the time of calibration.

The measurement standards and instruments used during the calibration of this instrument are traceable to the United States National Institute of Standards and Technology (NIST), other reputable National Institutes, natural physical constants, consensus standards, or by ratio type measurements.

This certificate applies to only the item identified and shall not be reproduced other than in full, without the specific written approval by Fluke Corporation. The user is obliged to have the in object recalibrated at appropriate intervals. Calibration Certificates without signature are not valid.

The Data type that could be found in this certificate is interpreted as follows:

- As Found — The unit needed adjustment and/or repair.
- As Left — The unit was adjusted and/or repaired.
- As Found/ As Left — The unit was calibrated without any adjustment and/or repair performed.

Comments:

Long Le

Metrology Technician

Standards Used

Asset #	Instrument Model	Cal Date	Cal Due
10127	FLUKE 5520A CALIBRATOR	29 June 2006	29 March 2007

End of Report



Calibration Certificate

Description:	TRUE RMS MULTIMETER	Certificate Number:	616620-70631029:1190872946
Manufacturer:	FLUKE	Date of Calibration:	27 September 2007
Model:	87 III	Date of Certificate:	27 September 2007
Serial Number:	70631029	Date Due:	27 September 2008
Customer Name:	STATE OF VERMONT	Procedure Name:	MFG MANUAL
City, State:	BURLINGTON, VT	Procedure Revision:	JUN-02
Customer Item ID:	70631029	Data Type:	FOUND-LEFT
PO Number:	S08-0359	Temperature:	23 ± 3.0 °Celsius
RMA Number:	3799121	Relative Humidity:	25% ≤ RH ≤ 60%
		Test Result:	PASS

The Fluke Corporation, NQA ISO 9001:2000 ISO Certification No. 10100/2, certifies that the instrument identified above was calibrated in accordance with applicable Fluke calibration procedures. Its calibration processes are ISO-9001 controlled and are designed to certify that the instrument was within its published specifications at the time of calibration.

The measurement standards and instruments used during the calibration of this instrument are traceable to the United States National Institute of Standards and Technology (NIST), other reputable National Institutes, natural physical constants, consensus standards, or by ratio type measurements.

This certificate applies to only the item identified and shall not be reproduced other than in full, without the specific written approval by Fluke Corporation. The user is obliged to have the in object recalibrated at appropriate intervals. Calibration Certificates without signature are not valid.

The Data type that could be found in this certificate is interpreted as follows:

- As Found — The unit needed adjustment and/or repair.
- As Left — The unit was adjusted and/or repaired.
- As Found/ As Left — The unit was calibrated without any adjustment and/or repair performed.

Comments:A handwritten signature in black ink, appearing to read 'Long Le', is written over a light blue horizontal line.

Long Le

Metrology Technician

Standards Used

Asset #	Instrument Model	Cal Date	Cal Due
10127	FLUKE 5520A CALIBRATOR	27 February 2007	27 November 2007

End of Report



Calibration Certificate

Description:	TRUE RMS MULTIMETER	Certificate Number:	616620-70631029:1232002530
Manufacturer:	FLUKE	Date of Calibration:	15 January 2009
Model:	87 III	Date of Certificate:	15 January 2009
Serial Number:	70631029	Date Due:	15 January 2010
Customer Name:		Procedure Name:	
STATE OF VERMONT		MFG MANUAL	
City, State:	BURLINGTON, VT	Procedure Revision:	JUN-02
Customer Item ID:	70631029	Data Type:	FOUND-LEFT
PO Number:	S090506	Temperature:	23.00 °Celsius
RMA Number:	4077767	Relative Humidity:	40 %
Result Summary:	PASS		

The Data type that could be found in this certificate must be interpreted as:

- As-Found - Calibration data collected before the unit is adjusted and/or repaired.
- As-Left - Calibration data collected after the unit is adjusted and/or repaired.
- Found-Left - Calibration data collected without any adjustment and/or repair performed.

This certificate applies only to the item identified and shall not be reproduced other than in full, without the specific written approval by Fluke Corporation. The user is obliged to have the object recalibrated at appropriate intervals.

Comments:

Long Le
Metrology Technician

Traceability Information

For each parameter listed below the calibration was conducted using an unbroken chain of standards to:

DC Voltage

The Voltage Reference standard group, traceable to the Fluke Primary Standards Laboratory, which is traceable to the U.S. representation of the volt, through the internationally accepted value of the Josephson constant $K_j=483597.9$ GHz/V and a 10 Volt Josephson Array Voltage Standard.

Frequency and Period

The GPS-Rubidium Disciplined oscillator frequency standard, traceable to the United States Naval Observatory (USNO), which is traceable to the National Institute of Standards and Technology.

AC Voltage, Resistance, DC Current, AC Current, Capacitance, Inductance, Phase

The Fluke Primary Standards Laboratory, which is traceable to the National Institute of Standards and Technology.

AC Voltage Flatness

The Fluke Primary Standards Laboratory, or Agilent Technologies Standards Laboratory which are traceable to the National Institute of Standards and Technology.

Humidity

The Vaisala Measurement Standards Laboratory Primary Salt calibration bath, with traceability based on the physical phenomena in which the equilibrium relative humidity values associated with certain saturated salt solutions are known.

Rise Time

The Tektronix GmbH Calibration Laboratory which is traceable to the Physikalisch-Technische Bundesanstalt.

Radiation Temperature

The National Institute of Standards and Technology, the Physikalisch-Technische Bundesanstalt, or Hart Scientific.

Contact Temperature

The Fluke Primary Standards Laboratory, Hart Scientific, which are traceable to the National Institute of Standards and Technology.

Gas Flow

The DHI Calibration Laboratory, which is traceable to the National Institute of Standards and Technology.

Pressure

The DHI Calibration Laboratory, which is traceable to the Laboratoire National D'Essais, Physikalisch-Technische Bundesanstalt and National Institute of Standards and Technology, or traceable to the Mensor or Ashcroft Calibration Laboratories, which are traceable to the National Institute of Standards and Technology.

Standards Used

Asset #	Instrument Model	Cal Date	Cal Due
10127	FLUKE 5520A CALIBRATOR	28 August 2008	28 May 2009

End of Report

1420 75th St. SW
Everett, Washington 98203
USA

Calibration Certificate



NQA ISO 9001:2000 (10100/2)

Description:	TRUE RMS MULTIMETER	Certificate Number:	616620-70631029:1279171008
Manufacturer:	FLUKE	Date of Calibration:	15 July 2010
Model:	87 III	Date of Certificate:	15 July 2010
Serial Number:	70631029	Recommended Due Date:	15 July 2011
Customer Name:	STATE OF VERMONT	Procedure Name:	MFG MANUAL
City, State:	BURLINGTON, VT	Procedure Revision:	JUN-02
Customer Item ID:	70631029	Data Type:	FOUND-LEFT
PO Number:	S10-1097	Temperature:	23.00 °Celsius
RMA Number:	4499767	Relative Humidity:	40 %
Result Summary:	PASS		
Received Date:			

The Data type that could be found in this certificate must be interpreted as:

- As-Found - Calibration data collected before the unit is adjusted and/or repaired.
- As-Left - Calibration data collected after the unit is adjusted and/or repaired.
- Found-Left - Calibration data collected without any adjustment and/or repair performed.

This certificate applies only to the item identified and shall not be reproduced other than in full, without the specific written approval by Fluke Corporation. The user is obliged to have the object recalibrated at appropriate intervals.

Comments:

Long Le
Metrology Technician

Traceability Information

For each parameter listed below the calibration was conducted using an unbroken chain of standards to:

DC Voltage

The Voltage Reference standard group, traceable to the Fluke Primary Standards Laboratory, which is traceable to the U.S. representation of the volt, through the internationally accepted value of the Josephson constant $K_j=483597.9$ GHz/V and a 10 Volt Josephson Array Voltage Standard.

Frequency and Period

The GPS-Rubidium Disciplined oscillator frequency standard, traceable to the United States Naval Observatory (USNO), which is traceable to the National Institute of Standards and Technology.

AC Voltage, Resistance, DC Current, AC Current, Capacitance, Inductance, Phase

The Fluke Primary Standards Laboratory, which is traceable to the National Institute of Standards and Technology.

AC Voltage Flatness

The Fluke Primary Standards Laboratory, or Agilent Technologies Standards Laboratory which are traceable to the National Institute of Standards and Technology.

Humidity

The Vaisala Measurement Standards Laboratory Primary Salt calibration bath, with traceability based on the physical phenomena in which the equilibrium relative humidity values associated with certain saturated salt solutions are known.

Rise Time

The Tektronix GmbH Calibration Laboratory which is traceable to the Physikalisch-Technische Bundesanstalt.

Radiation Temperature

The National Institute of Standards and Technology, the Physikalisch-Technische Bundesanstalt, or Hart Scientific.

Contact Temperature

The Fluke Primary Standards Laboratory, Hart Scientific, which are traceable to the National Institute of Standards and Technology.

Gas Flow

The DHI Calibration Laboratory, which is traceable to the National Institute of Standards and Technology.

Pressure

The DHI Calibration Laboratory, which is traceable to the Laboratoire National D'Essais, Physikalisch-Technische Bundesanstalt and National Institute of Standards and Technology, or traceable to the Mensor or Ashcroft Calibration Laboratories, which are traceable to the National Institute of Standards and Technology.

Standards Used

Asset #	Instrument Model	Cal Date	Cal Due
10127	FLUKE 5520A CALIBRATOR	01 June 2010	01 March 2011

End of Report



Calibration Certificate

Description:	THERMOCOUPLE MODULE	Certificate Number:	736736-92460067:1190904712
Manufacturer:	FLUKE	Date of Calibration:	27 September 2007
Model:	80TK	Date of Certificate:	27 September 2007
Serial Number:	92460067	Date Due:	27 September 2008
Customer Name:	STATE OF VERMONT	Procedure Name:	FLUKE 80TK:(1 YEAR) CAL VER/5520A/8842A
City, State:	BURLINGTON, VT	Procedure Revision:	1.1
Customer Item ID:	92460067	Data Type:	FOUND-LEFT
PO Number:	S08-0359	Temperature:	23 ± 3.0 °Celsius
RMA Number:	3799121	Relative Humidity:	25% ≤ RH ≤ 60%
		Test Result:	PASS

The Fluke Corporation, NQA ISO 9001:2000 ISO Certification No. 10100/2, certifies that the instrument identified above was calibrated in accordance with applicable Fluke calibration procedures. Its calibration processes are ISO-9001 controlled and are designed to certify that the instrument was within its published specifications at the time of calibration.

The measurement standards and instruments used during the calibration of this instrument are traceable to the United States National Institute of Standards and Technology (NIST), other reputable National Institutes, natural physical constants, consensus standards, or by ratio type measurements.

This certificate applies to only the item identified and shall not be reproduced other than in full, without the specific written approval by Fluke Corporation. The user is obliged to have the in object recalibrated at appropriate intervals. Calibration Certificates without signature are not valid.

The Data type that could be found in this certificate is interpreted as follows:

- As Found — The unit needed adjustment and/or repair.
- As Left — The unit was adjusted and/or repaired.
- As Found/ As Left — The unit was calibrated without any adjustment and/or repair performed.

Comments:


 Scott Desmarais
 Metrology Technician

Standards Used

Asset #	Instrument Model	Cal Date	Cal Due
10067	FLUKE 8842A DIGITAL MULTIMETER	25 June 2007	25 March 2008
10776	FLUKE 5520A CALIBRATOR	09 May 2007	09 November 2007

End of Report