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LABORATORY
ACCREDITATION
BUREAU
ACCREDITED ISO/IEC 17025
Certificate #L2216.01 Calibration



Calibration Certificate

(Level 3) Accredited Calibration with Measurement Uncertainty

928672



Customer

Intertek Testing Services (3283)
8431 Murphy Drive
Middleton, Wisconsin 53562
PO Number: VISA-EXP 04/13

Instrument Profile

Manufacturer: Omega
Model: HH501BJK
Asset ID #: 001223
Serial #: 100006
Description: Digital Thermometer

Calibration Information

Calibration Date: 02/21/2011

Technician: Jeremiah Popp

†Calibration Due Date: 02/21/2012

Calibration Location: Wisconsin Lab

Ambient Conditions: 74.8 °F (23.8 °C) / 26.7% RH

Calibration Procedure: CP0030

Condition

Physical Damage: No evidence of physical/cosmetic damaged noted during this calibration.

As Found: Fully operational and within tolerance

As Left: Calibrated to Manufacturers specifications and left within tolerance

Technician Remarks

Quality & Traceability Statement

The results reported herein apply only to the calibration of the item described above. All calibration standards used in this calibration are traceable to SI units through NIST or equivalent NMI (National Measurement Institute). Our Quality System is accredited to ISO/IEC 17025:2005 and ANSI/NCCL Z540-1:1994 via the Laboratory Accreditation Bureau. Details of the scope of our accreditation are available at www.L-A-B.com.

†Per the requirements of ISO-17025:2005, Cal Lab Co., Inc. does not make recommendations for recall therefore the listed Due Date is dictated by the owner of this equipment. Although the item calibrated meets the conditions or specifications at the time of the calibration, due to a number of factors the due date of the item calibrated does not imply continuing conformance during the calibration interval. The parameters of this calibration are directly or indirectly covered under our current scope of accreditation unless otherwise noted.

¹ For purposes of determining conformance with the listed specifications (tolerances), the observed value or a calculated value has been rounded to the nearest unit in the last right-hand digit used in expressing the specification limit, in accordance with the rounding method of ASTM Practice E 29, for Using Significant Digits in Test Data to Determine Conformance with Specifications.

² The reported expanded uncertainty of measurement is reported at a coverage factor of $k=2$, which for a normal distribution corresponds to a coverage of approximately 95%. The expanded measurement uncertainty calculation does include the resolution of the instrument calibrated, which in some cases, may be a dominate source of error, but does not include Type A contributors (repeatability/reproducibility studies) of the instrument calibrated unless specifically requested by the customer. The uncertainty values reflect the measurement processes uncertainty and may not reflect the measurement uncertainty listed on our scope of accreditation. The measurement uncertainty is not considered (i.e. measured value + Emu) when making statements of compliance to specification (i.e. In tolerance, OOT, Pass/Fail, etc.) unless requested by the customer.

J. Brent Shaddy
Metrology Manager Review & Approval
quality@callabco.com

Calibration Certificate # 928672

(continued from previous page)

Calibration Standard(s)

ID#	Manufacturer	Model#	Description	Due Date	Traceability#
1002-1507	Fluke	5520A-SC1100	Calibrator, Multi-Function, 1.1 GHz	01/31/2012	907803
1002-2237	China	HTC-1	Thermohygrometer	08/31/2011	895798

Calibration Data with Estimated Measurement Uncertainty [EMU]²

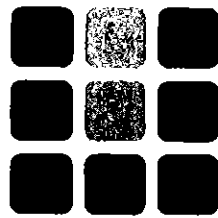
Function/Attribute	Nominal Value	As Found	Lot	As Left	Cor.	Tolerance
T1 Type K	-100 °C	-100		-100		-101 to -99 °C [EMU 0.61 °C]
T1 Type K	0.0 °C	0.1		0.1		-1.0 to 1.0 °C [EMU 0.19 °C]
T1 Type K	32.0 °F	32.0		32.0		30.0 to 34.0 °F [EMU 0.34 °F]
T1 Type K	100.0 °C K tc	100.2		100.2		98.9 to 101.1 °C [EMU 0.19 °C]
T1 Type K	500 °C	500		500		498 to 502 °C [EMU 0.65 °C]
T1 Type K	1000 °C	1000		1000		998 to 1002 °C [EMU 0.65 °C]
T1 Type K	1300 °C	1300		1300		1298 to 1302 °C [EMU 0.74 °C]
T1 Type J	0.0 °C	0.9		0.9		-1.0 to 1.0 °C [EMU 0.17 °C]
T1 Type J	32.0 °F	33.4		33.4		30.0 to 34.0 °F [EMU 0.30 °F]
T1 Type J	100.0 °C	100.8		100.8		98.9 to 101.1 °C [EMU 0.17 °C]
T1 Type J	500 °C	500		500		498 to 502 °C [EMU 0.61 °C]
T1 Type J	1000 °C	1001		1001		998 to 1002 °C [EMU 0.64 °C]
T2 Type K	-100 °C	-100		-100		-101 to -99 °C [EMU 0.61 °C]
T2 Type K	0.0 °C	-0.1		-0.1		-1.0 to 1.0 °C [EMU 0.19 °C]
T2 Type K	32.0 °F	31.8		31.8		30.0 to 34.0 °F [EMU 0.34 °F]
T2 Type K	100.0 °C	100.0		100.0		98.9 to 101.1 °C [EMU 0.19 °C]
T2 Type K	500 °C	500		500		498 to 502 °C [EMU 0.65 °C]
T2 Type K	1000 °C	999		999		998 to 1002 °C [EMU 0.65 °C]
T2 Type K	1300 °C	1299		1299		1298 to 1302 °C [EMU 0.74 °C]
T2 Type J	0.0 °C	0.1		0.1		-1.0 to 1.0 °C [EMU 0.17 °C]
T2 Type J	32.0 °F	32.1		32.1		30.0 to 34.0 °F [EMU 0.30 °F]
T2 Type J	100.0 °C	100.0		100.0		98.9 to 101.1 °C [EMU 0.17 °C]
T2 Type J	500 °C	500		500		498 to 502 °C [EMU 0.61 °C]
T2 Type J	1000 °C	1000		1000		998 to 1002 °C [EMU 0.64 °C]

Datasheet Rev. Date: 03/22/2011

Out of tolerance readings (OOT) are annotated with a ✕

End of Calibration Data

CALIBRATION SERVICE RECORD



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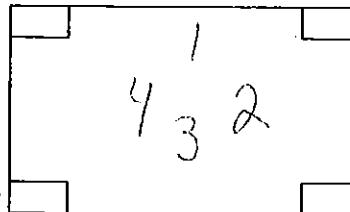
Page 1 of 1

MODEL NO. <u>GSE 350</u>		SERIAL NO. <u>101722</u>		DEVICE ISO CODE: <u>#8</u>
CAL DATE: <u>8/17/11</u>	MANUFACTURER: <u>GSE</u>	TOLERANCE: <u>NB41.11</u>	CAL LOCATION: <input checked="" type="checkbox"/> Customer <input type="checkbox"/> Other	
NEXT DUE: <u>2/17/12</u>	CAPACITY X RESOLUTION: <u>100 Lb X .01</u>	CUSTOMER: <u>ENTERPRISE</u>		
FREQ: <u>6mo</u>	CALIBRATION REASON: <input type="checkbox"/> Scheduled <input type="checkbox"/> Demand <input type="checkbox"/> Other	ORDER NO.: <u>B113A</u>		
LOCATION: <u>EFE LAB</u>		DESCRIPTION: <u>BENCH SCALE</u>		

Parameter Tested	Actual As Found	Deviation	Final Reading
1	1.00	0	1.00
5	5.00	0	5.00
10	10.00	0	10.00
50	49.99	-.01	50.00
100	99.98	-.02	100.00

Shift Test

CORNER	LOAD	ERROR	FINAL READING
1	50lb	0	50.00
2	50	+.1	50.01
3	50	-.1	49.99
4	50	+.1	50.01



- Were actual values within tolerance? ☒ Yes ☐ No
- Was device adjusted? ☒ Yes ☐ No
- Were final values within tolerance? ☒ Yes ☐ No

LABEL USED: ☒ Calibration / Tested ☐ Limited Calibration ☐ DO NOT USE - Out of Calibration

Leveled: ☒ Yes ☐ No

United Scale's Operational Procedure VOP-19-01 is followed for device calibration. TEST WEIGHT STANDARDS USED (Traceable to NIST HANDBOOK 105-1):

MSC C41, w34 DY

UNCERTAINTY MEASUREMENT: 1012 Lb

COMMENTS:

TESTED BY: (Technician) [Signature]

DATE: 8/17/11

This calibration is accredited and meets the requirements of ISO/IEC 17025 as verified by ANSI-ASQ National Accreditation Board / ACLASS. Refer to certificate and scope of accreditation AC-1148.

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Rev: 6-10

Intertek Testing Services NA Inc.

Middleton, Wisconsin

Calibration Date: 9/8/11

Next calibration due: 3/8/12

Calibrated by: SS

SERIAL NUMBER: NA

USE PROCEDURE: MID-OE-LAB-027

Calibration Date of Asset # 713: 8/17/11

DESCRIPTION: Audit weights

Model: Alnsworth

SERIAL #: 39392

WHI#: 029

Weight (G)	Scale reading	Deviation G	Deviation %
0.003	0.0031	0.0001	3.33%
0.01	0.01	0.0000	0.00%
0.02	0.02	0.0000	0.00%
0.03	0.03	0.0000	0.00%
0.05	0.0498	-0.0002	-0.40%
0.1	0.1	0.0000	0.00%
0.2	0.2	0.0000	0.00%
0.3	0.2997	-0.0003	-0.10%
0.5	0.4998	-0.0002	-0.04%
1	1.0003	0.0003	0.03%
2	2.0004	0.0004	0.02%
3	3.0006	0.0006	0.02%
5	5.0006	0.0006	0.01%
10	10.0009	0.0009	0.01%
20	20.0018	0.0018	0.01%
30	30.0024	0.0024	0.01%
50	50.0009	0.0009	0.00%
100	100.0026	0.0026	0.00%

Average Deviation: 0.0005500

Standard Deviation: 0.000877329

Scale accuracy

Total Uncertainty: 0.0001

Reviewed by: [Signature]

Date: 9/8/11

Measurement Uncertainty is calculated using the following formula:

$$O.M.U. = k \cdot \sqrt{(A.D.)^2 + (S.D.)^2 + (R.M.U./2)^2}$$

O.M.U. = Overall Measurement Uncertainty

A.D. = Average Deviation of the difference of all measured results compared to the reference value.

S.D. = Standard Deviation of the difference of all measured results compared to the reference value.

k = Confidence Factor (2 for 95% confidence)

R.M.U. = Standard Measurement Uncertainty of Reference Measurement Equipment. R.M.U. is considered as the measurement uncertainty as stated on calibration certificates of equipment, or the tolerance listed in the calibration standard of the test equipment.

Intertek Testing Services NA Inc.

Middleton, Wisconsin

Calibration Date: 6/10/11

Next Calibration Due: 12/10/11

Calibrated by: JS

USING: Fluke Multimeter #109

Use Procedure: MID-OE-LAB-004

DESCRIPTION: Delmhorst calibration block

Model: MSC-1

SERIAL #: 101200

WHI#: 049

Block 1				
Calibration Block Possibilities	Desired Reading	Meter Reading	Reading Deviation	
12%	8.33	8.34	0.01	Measurement
12%	8.33	8.4	0.07	Uncertainty Block 1
12%	8.33	8.39	0.06	0.260542857
12%	8.33	8.31	0.02	
22%	1.1	1.3	0.20	
22%	1.1	1.3	0.20	
22%	1.1	1.4	0.30	
22%	1.1	1.2	0.10	
Average Deviation:			0.12	
Standard Deviation:			0.10	

Block 2				
Calibration Block Possibilities	Desired Reading	Meter Reading	Reading Deviation	
12%	8.33	8.42	0.09	
12%	8.33	8.43	0.10	Measurement
12%	8.33	8.49	0.16	Uncertainty Block 2
12%	8.33	8.29	0.04	0.1408125
22%	1.1	1.08	0.02	
22%	1.1	1.1	0.00	
22%	1.1	1.1	0.00	
22%	1.1	1	0.10	
Average Deviation:			0.06	
Standard Deviation:			0.06	

Acceptable range: 7.50 - 9.16 nS for 12% side

Acceptable range: 0.99 - 1.21 MΩ for 22% side

Fluke meter at 0.1

Reviewed By: [Signature] Date: 6/10/11

Measurement Uncertainty is calculated using the following formula:

$$O.M.U. = k \cdot \sqrt{(A.D.)^2 + (S.D.)^2 + (R.M.U./2)^2}$$

O.M.U. = Overall Measurement Uncertainty

A.D. = Average Deviation of the difference of all measured results compared to the reference value.

S.D. = Standard Deviation of the difference of all measured results compared to the reference value.

k = Confidence Factor (2 for 95% confidence)

R.M.U. = Standard Measurement Uncertainty of Reference Measurement Equipment. R.M.U. is considered as the measurement uncertainty as stated on calibration certificates of equipment, or the tolerance listed in the calibration standard of the test equipment.

Intertek Testing Services NA Inc.

Middleton, Wisconsin

Calibration Date: 9/8/11

Next calibration due: 3/8/12

Calibrated by: SS

USING: #008 Platform scale and procedures located:

USE PROCEDURE: MID-OE-LAB-027

Calibration Date of Asset #008

DESCRIPTION:

Audit weights

Model: Rice Lake

SERIAL #: n/a

WHI#: 160

Weight designation		Scale reading	Deviation
A	5.00	5.00	0.00
B	10.00	10.00	0.00
C	10.00	9.99	-0.01
D	20.00	20.00	0.00
E	25.00	25.00	0.00
F	25.00	25.00	0.00

Average Deviation: -0.0016667

Standard Deviation: 0.004082483

Scale accuracy

0.01

Total Uncertainty:

0.01

Reviewed by

Date:

9/8/11

Measurement Uncertainty is calculated using the following formula:

$$O.M.U. = k \cdot \sqrt{(A.D.)^2 + (S.D.)^2 + (R.M.U./2)^2}$$

O.M.U. = Overall Measurement Uncertainty

A.D. = Average Deviation of the difference of all measured results compared to the reference value.

S.D. = Standard Deviation of the difference of all measured results compared to the reference value.

k = Confidence Factor (2 for 95% confidence)

R.M.U. = Standard Measurement Uncertainty of Reference Measurement Equipment. R.M.U. is considered as the measurement uncertainty as stated on calibration certificates of equipment, or the tolerance listed in the calibration standard of the test equipment.

Intertek Testing Services NA Inc.

Middleton, Wisconsin

Calibration Date: 6-24-11 Cal next due Date: 12-24-11 Calibrated by: KS

USING: Atomic clock #785

USE PROCEDURE: MID-OE-LAB-016

DESCRIPTION: Timer

Model:

Big Digit

SERIAL #:

na

WHI#:

645

	Atomic Clock hh:mm:ss
Ending Time	9:20:00
Beginning Time	9:15:00
Elapsed Time	0:05:00

Elapsed time of Stopwatch/Timer To be calibrated hh:mm:ss
0:05:00

Deviation:

0:00:00

Uncertainty of Readings at 95% CL =

00:00:00.00

Uncertainty of controlling the on and off of timer/stopwatch at 95% CL = (sec.)

00:00:00.13

Total uncertainty at 95% CL

00:00:00.26

hh:mm:ss.00

Always start the timers/stopwatches at 0 (zero). Note time on #785 atomic clock when you start the timer/stopwatch and record as beginning time. Timer/stopwatch beginning time is always 0.

Reviewed by _____ Date: _____

Measurement Uncertainty is calculated using the following formula:

$$O.M.U. = k \cdot \sqrt{(A.D.)^2 + (S.D.)^2 + (R.M.U.)^2}$$

O.M.U. = Overall Measurement Uncertainty

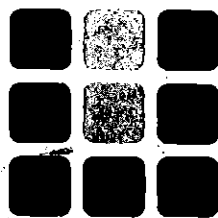
A.D. = Average Deviation of the difference of all measured results compared to the reference value.

S.D. = Standard Deviation of the difference of all measured results compared to the reference value.

k = Confidence Factor (2 for 95% confidence)

R.M.U. = Standard Measurement Uncertainty of Reference Measurement Equipment. R.M.U. is considered as the measurement uncertainty as stated on calibration certificates of equipment, or the tolerance listed in the calibration standard of the test equipment.

CALIBRATION SERVICE RECORD



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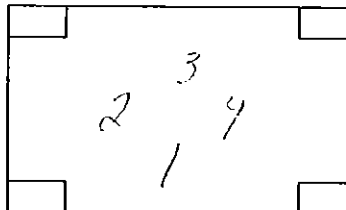
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MODEL NO. <u>Explorer</u>		SERIAL NO. <u>B258010635</u>		DEVICE ISO CODE: <u>#713</u>
CAL DATE: <u>8/12/11</u>	MANUFACTURER: <u>OHAUS</u>	TOLERANCE: <u>1B/11</u>	CAL LOCATION: <input checked="" type="checkbox"/> Customer <input type="checkbox"/> Other	
NEXT DUE: <u>2/12/12</u>	CAPACITY X RESOLUTION: <u>210 G X 10001 G</u>	CUSTOMER: <u>SAVATYER</u>		
FREQ. <u>6 mo</u>	CALIBRATION REASON: <input checked="" type="checkbox"/> Scheduled <input type="checkbox"/> Demand <input type="checkbox"/> Other	ORDER NO.: <u>BH3AO</u>		
LOCATION: <u>EEC LAB</u>		DESCRIPTION: <u>BIRMANCK</u>		

Parameter Tested	Actual As Found	Deviation	Final Reading
1000 G	10010	0	10010
2000 G	2000	0	2000
100 G	99.9999	-0.0001	99.9999
200 G	199.999	-0.0001	199.9999

Shift Test

CORNER	LOAD	ERROR	FINAL READING
1	1000 G	-0.0001	99.9999
2	100	+0.0002	100.0002
3	100	0	100.0000
4	100	-0.0003	99.9997



Were actual values within tolerance? ☒ Yes ☐ No

Was device adjusted? ☐ Yes ☒ No

Were final values within tolerance? ☒ Yes ☐ No

LABEL USED: ☒ Calibration / Tested ☐ Limited Calibration ☐ DO NOT USE - Out of Calibration Levelled: ☐ Yes ☒ No

United Scale's Operational Procedure VOP-19-01 is followed for device calibration. TEST WEIGHT STANDARDS USED (Traceable to NIST HANDBOOK 105-1):

1341

UNCERTAINTY MEASUREMENT: 10002 G

COMMENTS: _____

TESTED BY: (Technician) [Signature] DATE: 8/12/11

This calibration is accredited and meets the requirements of ISO/IEC 17025 as verified by ANSI-ASQ National Accreditation Board / ACLASS. Refer to certificate and scope of accreditation AC-1148.

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