National Institute of Standards and Technology

NVLAP®

National Voluntary Laboratory Accreditation Program

ISO/IEC 17025:1999
ISO 9002:1994

Scope of Accreditation

Revised 9/8/2004

CALIBRATION LABORATORIES **NVLAP LAB CODE 200659-0**

ORNL METROLOGY LABORATORY
P.O. Box 2008, MS-6366
Bethel Valley Road
Oak Ridge, TN 37831
Mr. Robert P. Effler
Phone: 865-574-7349 Fax: 865-241-4644
E-Mail: efflerrpjr@ornl.gov
URL: http://www.ornl.gov/OQP/msms/msms_main.htm

NVLAP Code: 20/A01 ANSI/NCSL Z540-1-1994; Part 1 Compliant

ELECTROMAGNETICS - DC/LOW FREQUENCY

NVLAP Code: 20/E02
AC Current Output

Range in A	***Best Uncertainty (±) in A*** [note 1] ***Frequency in Hertz***					
	10	***20***	***40***	***1 k***	***5 k***	***10 k***
0.00022	1.26 E-02	2.31 E-03	2.24 E-03	1.99 E-03	2.72 E-03	2.80 E-03
0.0022	1.34 E-04	2.74 E-05	2.09 E-05	1.78 E-05	2.37 E-05	2.95 E-05
0.022	1.32 E-03	2.12 E-04	2.37 E-04	2.42 E-04	2.99 E04	3.79 E-04
0.22	1.03 E-02	3.80 E-03	4.37 E-03	3.92 E-03	3.38 E-03	6.21 E-03
2.2		2.02 E-02		9.43 E-03	1.34 E-02	1.40 E-02
11.0			4.48 E-02	4.45 E-02	5.05 E-02	3.23 E-01

September 30, 2005

Effective through

For the National Institute of Standards and Technology

National Institute of Standards and Technology

NVLAP®

National Voluntary Laboratory Accreditation Program

ISO/IEC 17025:1999
ISO 9002:1994

Scope of Accreditation

Revised 9/8/2004

CALIBRATION LABORATORIES **NVLAP LAB CODE 200659-0**

ORNL METROLOGY LABORATORY

NVLAP Code: 20/E05

2 Wire Resistance

Range in Ω	*Best Uncertainty (±) in Ω*[note 1]	*Remarks*
10	2.89 E-01	
100	2.91 E-01	
1 k	3.01 E-01	
10 k	4.18 E-01	
100 k	1.63	
1 M	2.31 E+01	
10 M	7.31 E+02	
100 M	5.29 E+01	

4 Wire Resistance

10	2.69 E-04	
100	2.11 E-03	
1 k	1.31 E-02	
10 k	1.31 E-01	
100 k	1.37	

September 30, 2005

Effective through

For the National Institute of Standards and Technology

ISO/IEC 17025:1999
ISO 9002:1994

Scope of Accreditation

CALIBRATION LABORATORIES **NVLAP LAB CODE 200659-0**

ORNL METROLOGY LABORATORY

1 M	2.28 E+01
10 M	7.31 E+02
100 M	1.21 E+04

NVLAP Code: 20/E06
DC Voltage

Range in V	*Best Uncertainty (±) in V*[note 1]	*Remarks*
0.22	3.27 E-06	
2.2	2.20 E-05	
11	1.52 E-04	
22	2.92 E-04	
220	2.73 E-03	
1100	1.26 E-02	

September 30, 2005

Effective through

For the National Institute of Standards and Technology

National Institute of Standards and Technology

NVLAP®

National Voluntary Laboratory Accreditation Program

ISO/IEC 17025:1999
ISO 9002:1994

Scope of Accreditation

Revised 9/8/2004

CALIBRATION LABORATORIES **NVLAP LAB CODE 200659-0**

ORNL METROLOGY LABORATORY

NVLAP Code: 20/E06
DC Voltage Fixed Points

Output in V	*Best Uncertainty (±) in V*[note 1]	*Remarks*
0.1	1.22 E-06	5720A
1	3.65 E-06	5720A
10	2.46 E-05	5720A
100	3.33 E-04	5720A
1000	4.16 E-03	5720A

NVLAP Code: 20/E06
DC Current

Range in A	*Best Uncertainty (±) in A*[note 1]	*Remarks*
0.00022	1.38 E-08	
0.0022	1.14 E-07	
0.022	1.45 E-06	
0.22	3.75 E-05	
2.2	2.85 E-03	
11.0	4.89 E-03	

September 30, 2005

Effective through

For the National Institute of Standards and Technology

National Institute of Standards and Technology

NVLAP®

National Voluntary Laboratory Accreditation Program

ISO/IEC 17025:1999
ISO 9002:1994

Scope of Accreditation

Revised 9/8/2004

CALIBRATION LABORATORIES **NVLAP LAB CODE 200659-0**

ORNL METROLOGY LABORATORY

NVLAP Code: 20/E09
LF AC Voltage

Range	***Best Uncertainty (±) in % + μV*** *note 1* ***Frequency in Hertz***							
	10 to 20	***20 to 40***	***40 to 20 k***	***20 k to 50 k***	***50 k to 100 k***	***100 k to 300 k***	***300 k to 500 k***	***500 k to 1 M***
2.2 mV	0.209 + 4	0.209 + 4	0.18 + 4	0.808 + 4	1.680 + 10	1.680 + 10	1.680 + 10	1.683 + 20
22 mV	0.036 + 4	0.036 + 4	0.047 + 4	0.047 +4	0.105 + 4	0.406 + 5	1.214 + 10	1.215 + 20
220 mV	0.034 + 12	0.032 + 7	0.032 + 7	0.047 +7	0105 + 7	0.405 + 17	1.214 + 20	1.215 + 25
2.2 V	0.034 + 40	0.032 + 15	0.032 + 15	0.046 + 8	0.104 + 10	0.404 + 30	1.213 + 80	1.214 + 200
22 V	0.048 + 400	0.047 + 150	0.047 + 150	0.052 + 50	0.150 + 100	0.150 +200	1.790 + 600	1.791 + 2000
	Best Uncertainty (±) in % + mV *note 1*							
220 V	0.071 + 4	0.070 + 1.5	0.070 + 1.5	0.150 + 0.6	0.358 + 1	0.358 + 2.5	1.749 + 16	1.777 + 40
1100 V	0.067 + 16	0.053 + 4	0.053 + 3.5					

September 30, 2005

Effective through

For the National Institute of Standards and Technology

National Institute of Standards and Technology

NVLAP®

National Voluntary Laboratory Accreditation Program

ISO/IEC 17025:1999
ISO 9002:1994

Scope of Accreditation

Revised 9/8/2004

CALIBRATION LABORATORIES **NVLAP LAB CODE 200659-0**

ORNL METROLOGY LABORATORY

TIME AND FREQUENCY

NVLAP Code: 20/F01
Frequency Dissemination

Range in Hz	*Best Uncertainty (±)[note 1]*	*Remarks*
10 M	1.07×10^{-11}	GPS Master Oscillator

THERMODYNAMIC

NVLAP Code: 20/T05
Pressure
Absolute Mode

Range	*Best Uncertainty (±) in ppm of reading[note 1]*	*Remarks*
5.5 kPa to 34.5 kPa	241.8	
0.8 psia to 5 psia	241.8	
34.5 kPa to 172.3 kPa	48.6	
5 psia to 25 psia	48.6	
82.7 kPa to 3347.4 kPa	33.9	
12 psia to 500 psia	33.9	

September 30, 2005

Effective through

For the National Institute of Standards and Technology

ISO/IEC 17025:1999
ISO 9002:1994

Scope of Accreditation

CALIBRATION LABORATORIES **NVLAP LAB CODE 200659-0**

ORNL METROLOGY LABORATORY

206.8 kPa to 6894.8 kPa	31
30 psia to 1000 psia	31
Gauge Mode	
5.5 kPa to 172.3 kPa	30.3
0.8 psig to 25 psig	30.3
82.7 kPa to 3447.4 kPa	29.9
12 psig to 500 psig	29.9
206.8 kPa to 6894 kPa	29.9
30 psig to 1000 psig	29.9

September 30, 2005

Effective through

For the National Institute of Standards and Technology

National Institute of Standards and Technology

NVLAP®

National Voluntary Laboratory Accreditation Program

ISO/IEC 17025:1999
ISO 9002:1994

Scope of Accreditation

Revised 9/8/2004

CALIBRATION LABORATORIES **NVLAP LAB CODE 200659-0**

ORNL METROLOGY LABORATORY

NVLAP Code: 20/T07
Resistance Thermometry

Range °C	*Best Uncertainty (±) in mK*	*Remarks*
0.01	2.2	TPW
231.928	10.3	Sn FP
419.527	10.3	Zn FP

1. Represents an expanded uncertainty using a coverage factor, k=2, at an approximate level of confidence of 95%.

September 30, 2005

Effective through

For the National Institute of Standards and Technology