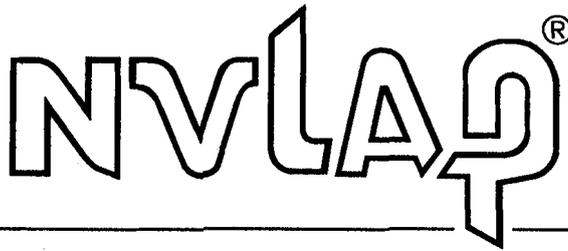


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CALIBRATION LABORATORIES

NVLAP LAB CODE 105014-0

SOUTHERN CALIFORNIA EDISON COMPANY

7300 Fenwick Lane
Westminster, CA 92683

Mr. Jack Burdick

Phone: 714-895-0422 Fax: 714-895-0686

E-Mail: burdicjj@sce.com

URL: <http://www.edisonmetrology.com>

NVLAP Code: 20/A01

ANSI/NCSL Z540-1-1994; Part 1

Compliant

DIMENSIONAL

NVLAP Code: 20/D03

Gage Blocks

Nominal Length, in.

Best Uncertainty (\pm) in $\mu\text{in.}$ ^{note 1}

0.00055 to 0.04000

2.8

>0.04000 to 0.25000

2.5

>0.25000 to 1.0000

2.6

2.0000

2.9

3.0000

3.1

4.0000

3.3

5.0000

3.6

6.0000

3.9

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7.0000	4.1
8.0000	4.4
10.000	4.9
12.000	5.6
16.000	6.8
20.000	7.9

Nominal Length, mm

Best Uncertainty (\pm) in nm^{note 1}

0.00100 to <1.0000	72
1.0000 to 25.000	63
>25.000 to 50.000	74
>50.000 to 100.00	84

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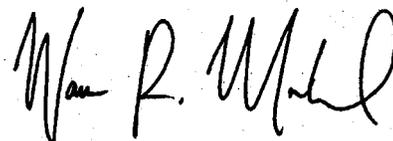
SOUTHERN CALIFORNIA EDISON COMPANY

NVLAP Code: 20/D11

Spherical Diameter; Ring Gages

<i>Range</i>	<i>Best Uncertainty (\pm)^{note 1}</i>	<i>Remarks</i>
0.040 to 0.825 in	7 μ in	Comparison to gage blocks
>0.825 to 1.510 in	11 μ in	Comparison to gage blocks
>1.510 to 2.510 in	14 μ in	Comparison to gage blocks
>2.510 to 4.510 in	18 μ in	Comparison to gage blocks
>4.510 to 6.510 in	23 μ in	Comparison to gage blocks
>6.510 to 9.010 in	28 μ in	Comparison to gage blocks
>9.010 to 12.010 in	35 μ in	Comparison to gage blocks
>12.010 to 13.25 in	53 μ in	Comparison to gage blocks

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ELECTROMAGNETICS - DC/LOW FREQUENCY

NVLAP Code: 20/E05

DC Resistance

<i>Nominal Value in Ohms</i>	<i>Best Uncertainty (\pm) in ppm^{note 1}</i>	<i>Remarks</i>
100 μ	8.20	Automated DC Resistance Calibration System
1 m	5.50	Automated DC Resistance Calibration System
10 m	3.70	Automated DC Resistance Calibration System
100 m	2.10	Automated DC Resistance Calibration System
1	0.40	Automated DC Resistance Calibration System
10	0.40	Automated DC Resistance Calibration System
25	0.50	Automated DC Resistance Calibration System
100	0.50	Automated DC Resistance Calibration System

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1 k	0.50	Automated DC Resistance Calibration System
10 k	0.50	Automated DC Resistance Calibration System
100 k	1.50	Automated DC Resistance Calibration System
1 M	2.30	Automated DC Resistance Calibration System
10 M	3.30	Automated DC Resistance Calibration System
100 M	4.00	Automated DC Resistance Calibration System

NVLAP Code: 20/E06
DC Voltage

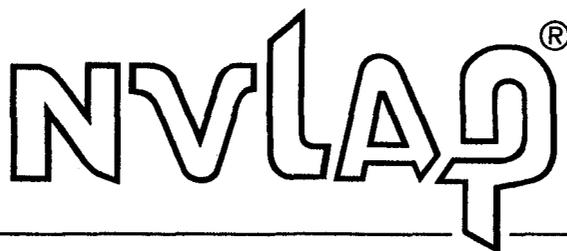
Range	Best Uncertainty (\pm)^{notes 1,2}	Remarks
1.018 V	0.80 ppm	Automated DC Calibration System
10.00 V	0.20 ppm	Automated DC Calibration System
1.000 V	0.80 ppm	Automated DC Calibration System
1 mV to 100 mV	1.3 ppm ^{note 6}	

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100 mV	0.7 ppm	Ratiometric Measurement Techniques performed by voltage transfer utilizing a high precision voltage
1.0 V	0.3 ppm	Ratiometric Measurement Techniques performed by voltage transfer utilizing a high precision voltage
10.0 V	0.3 ppm	Ratiometric Measurement Techniques performed by voltage transfer utilizing a high precision voltage
20.0 V	0.5	Ratiometric Measurement Techniques performed by voltage transfer utilizing a high precision voltage
100.0 V	0.3 ppm	Ratiometric Measurement Techniques performed by voltage transfer utilizing a high precision voltage
1000.0 V	0.7 ppm	Ratiometric Measurement Techniques performed by voltage transfer utilizing a high precision voltage

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NVLAP Code: 20/E09

LF AC Voltage

*Best Uncertainty (\pm) in ppm^{notes 1,3,4}
Frequency in Hz*

<i>Range</i>	<i>10</i>	<i>20</i>	<i>40</i>	<i>100</i>	<i>1k</i>	<i>10k</i>	<i>20k</i>	<i>50k</i>	<i>100k</i>	<i>300k</i>	<i>500k</i>	<i>800k</i>	<i>1M</i>
2 mV	448	912	889	969	379	865	1073	405	1131	1265	2116	2595	2938
10 mV	119	230	102	177	245	169	180	220	343	243	676	425	488
20 mV	83	70	67	67	66	76	76	165	261	361	521	372	442
30 mV	134	111	80	78	62	63	71	133	219	345	535	688	791
100 mV	36	72	23	42	34	35	34	43	77	169	220	287	225
190 mV	36	31	22	20	21	26	21	42	80	136	124	264	215
300 mV	46	61	30	32	34	19	28	36	59	116	143	189	205
1 V	120	36	18	10	13	12	11	25	14	87	102	104	98
1.9 V	36	22	22	9	9	9	8	18	11	94	101	85	89
3 V	26	34	25	17	14	14	13	27	14	100	108	95	97
10 V	20	42	19	10	10	9	10	11	16	80	100	111	100
19 V	26	23	20	11	9	9	10	11	16	98	109	82	82
30 V	30	37	26	19	15	16	19	37	44	118			
100 V	140	46	20	16	15	19	11	40	22				
190 V	47	27	20	20	13	13	13	41	26				

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300 V	37	29	18	27	22	29	46
500 V	33	25	17	20	19	38	52
700 V	29	23	18	17	19	44	54
1000 V	22	23	21	19	22		

MECHANICAL

NVLAP Code: 20/M05
Flow Rate

Nominal Flow Rate

Best Uncertainty (\pm) in percent^{notes 1,5}

0.8 to 30 L/s	0.3
0.1 to 800 mL/s	0.4
0.006 to 0.1 mL/s	0.7

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NVLAP Code: 20/M06

Force

<i>Nominal Force in lb</i>	<i>Best Uncertainty (\pm)^{note 1}</i>	<i>Remarks</i>
2 to 200 lb	0.025 %	Dead Weight
> 200 to 300 lb	0.086 lb	Proving Ring
> 300 to 500 lb	0.14 lb	Proving Ring
> 500 to 1,000 lb	0.28 lb	Proving Ring
> 1,000 to 2,000 lb	0.55 lb	Proving Ring
> 2,000 to 5,000 lb	0.84 lb	Proving Ring
> 5,000 to 10,000 lb	1.7 lb	Proving Ring
> 10,000 to 20,000 lb	5.5 lb	Proving Ring
> 20,000 to 35,000 lb	5.8 lb	Proving Ring
> 35,000 to 50,000 lb	13 lb	Proving Ring
> 50,000 to 60,000 lb	16 lb	Proving Ring
> 60,000 to 100,000 lb	26 lb	Proving Ring
> 100,000 to 300,000 lb	113 lb	Proving Ring

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NVLAP Code: 20/M08

Mass

<i>Range</i>	<i>Best Uncertainty (\pm)^{notes 1,2}</i>	<i>Remarks</i>
30 kg	55 mg	
20 kg	18 mg	
10 kg	2.9 mg	
5 kg	1.2 mg	
3 kg	0.64 mg	
2 kg	0.62 mg	
1 kg	0.10 mg	
500 g	0.046 mg	
300 g	0.050 mg	
200 g	0.032 mg	
100 g	0.022 mg	
50 g	0.016 mg	
30 g	0.015 mg	
20 g	0.0074 mg	
10 g	0.0066 mg	

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5 g	0.0038 mg
3 g	0.0034 mg
2 g	0.0026 mg
1 g	0.0015 mg
500 mg	0.0014 mg
300 mg	0.0014 mg
200 mg	0.0008 mg
100 mg	0.0020 mg
50 mg	0.0009 mg
30 mg	0.0011 mg
20 mg	0.0008 mg
10 mg	0.0007 mg
5 mg	0.0005 mg
3 mg	0.0008 mg
2 mg	0.0006 mg
1 mg	0.0006 mg

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1. Represents an expanded uncertainty using a coverage factor, $k=2$.
2. Approximate value. Actual value determined by the test statistics.
3. All ACV measurements performed via AC/DC transfer system.
4. Uncertainties listed are representative of the laboratories accredited capabilities within the stated ranges. Accreditation is not limited to only those fixed values shown.
5. Dependent upon principle of operation of device being calibrated and its performance relative to standards at the time of the test.
6. The equation: $\text{uncert.} = (A + B/m\text{VDC})^{0.5}$ (where $A=0.16$ and $B=0.013333$) is provided in order for potential customers to calculate approximate uncertainties for values down to 1 mV. Example: uncertainty at 1 mVDC would calculate to approximately ± 115.47 ppm.

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A handwritten signature in black ink, appearing to read "William R. Muhl". The signature is written in a cursive style with a large initial "W".

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