

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

SiteCal, Inc.
9975 Flanders Ct. NE
Blaine, Minnesota 55449
Jerry Flor
763-213-1284

CALIBRATION

Valid to: **May 4, 2022**

Certificate Number: **AC-1452**

Chemical Quantities

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
CO ₂ Measurement ¹	1 % 5 % 10 %	0.4 % 0.4 % 0.5 %	GD444 CO ₂ Analyzer
CO ₂ Analyzer	1 % 5 % 10 %	0.3 % 0.3 % 0.4 %	Certified gases

Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Micrometers ¹	Up to 1 in	74 μin	Gage Blocks
Calipers ¹	Up to 12 in (12.1 to 24) in	770 μin 740 μin	Gage Blocks

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Pressure Gages ¹	Up to 15 psiv	0.0057 psiv	Pressure Indicator and Modules
	(-0.27 to -0.04) psia	0.0004 psia	
	(-0.04 to 0.04) psia	0.0005 psia	
	(0.04 to 0.27) psia	0.0004 psia	
	Up to 60 psia	0.022 psia	
	Up to 5 psig	0.0031 psig	
	(5 to 60) psig	0.027 psi	
	(60 to 200) psig	0.072 psi	
(200 to 500) psig	0.19 psi	Class 1 Weights	
(500 to 3 000) psig	1.1 psi		
(3 000 to 7 500) psig	5.5 psi		
Laboratory Balance / Scale ¹ (0.001 mg resolution)	0 to 5 g		0.044 mg
(0.01 mg resolution)	0 to 62 g 0 to 300 g		0.24 mg 0.89 mg
(0.1 mg resolution)	0 to 1 000 g	3 mg	
(0.01 g resolution)	0 to 6 000 g 0 to 15 000 g 0 to 35 000 g	120 mg 0.24 g 2.4 g	
Industrial Scale ¹ (0.01 kg resolution)	0 to 100 kg	0.012 kg	Class F Weights
	(0.1 kg resolution)	0 to 250 kg	
Pipettes	(0.2 to 100) µL	0.052 µL	Laboratory Balance
	(100 to 1 000) µL	0.37 µL	
	1000 µL to 20 mL	1.8 µL	

Thermodynamic

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Temperature – Measure ¹	(-196 to 0) °C	0.039 °C	Hart 1502A
	(0 to 50) °C	0.036 °C	
	(50.1 to 100) °C	0.042 °C	
	(100.1 to 200) °C	0.044 °C	
	(200.1 to 300) °C	0.055 °C	

Thermodynamic

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Temperature-measure Thermocouples ¹ Type J Type K Type T	(-196 to 400) °C (-196 to 400) °C (-196 to 400) °C	0.29 °C 0.29 °C 0.17 °C	HP 3457A
Humidity Device Calibration	(5 to 95) % RH	0.7% RH	Dew Point Hygrometer
Humidity Measurement ¹	(0 to 90) % (90 to 100) %	1.8% RH 2.7% RH	Vaisala RH Meter

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
DC Voltage – Source	Up to 330 mV 330 mV to 3.29 V (3.3 to 32.9) V (33 to 329) V (330 to 1000) V	0.002 mV 0.045 mV 0.49 mV 0.0071 V 0.023 V	Fluke 5522A
DC Voltage – Measure	Up to 100 mV 100 mV to 1 V (1 to 10) V (10 to 100) V (100 to 1000) V	0.0017 mV 0.0083 mV 0.15 mV 0.0015 V 0.016 V	HP 3458A Option 2
DC Current – Source	Up to 330 µA 330 µA to 3.3 mA (3.2 to 32) mA (32 to 330) mA 330 mA to 1.1 A (1.1 to 2.9) A (2.9 to 11) A (11 to 20.5) A	0.081 µA 0.45 µA 0.0042 mA 0.042 mA 0.31 mA 0.0015 A 0.007 A 0.025 A	Fluke 5522A

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
DC Current – Measure	Up to 100 μ A	0.0034 μ A	HP 3458A Option 2 (Values over 1A shunted) Agilent 34330A Shunt
	100 μ A to 1 mA	0.031 μ A	
	(1 to 10) mA	0.3 μ A	
	(10 to 100) mA	4.8 μ A	
	100 mA to 1 A	0.14 mA	
	(1 to 5) A	0.17 A	
	(5 to 10) A	0.035 A	
AC Voltage – Source	(10 to 20) A	0.07 A	Fluke 5522A
	Up to 33 mV		
	Up to 10 Hz	0.089 mV	
	(10 to 45) Hz	0.058 mV	
	45 Hz to 1 kHz	0.045 mV	
	(1 to 10) kHz	0.056 mV	
	(10 to 20) kHz	0.13 mV	
	(20 to 50) kHz	0.18 mV	
	(50 to 100) kHz	0.39 mV	
	(100 to 450) kHz	0.39 mV	
	33 to 330 mV		
	Up to 10 Hz	0.15 mV	
	(10 to 45) Hz	0.65 mV	
	45 Hz to 1 kHz	0.066 mV	
	(1 to 10) kHz	0.71 mV	
	(10 to 20) kHz	0.15 mV	
	(20 to 50) kHz	0.35 mV	
	(50 to 100) kHz	0.85 mV	
	(100 to 500) kHz	0.85 mV	
	0.33 to 3.3 V		
	Up to 10 Hz	0.2 mV	
(10 to 45) Hz	0.12 mV		
45 Hz to 1 kHz	0.097 mV		
(1 to 10) kHz	0.1 mV		
(10 to 20) kHz	0.09 mV		
(20 to 50) kHz	0.19 mV		
(50 to 100) kHz	0.73 mV		
(100 to 450) kHz	1.3 mV		

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage – Source	3.3 to 33 V Up to 10 Hz (10 to 45) Hz 45 Hz to 1 kHz (1 to 10) kHz (10 to 20) kHz (20 to 50) kHz (50 to 90) kHz	0.77 mV 0.7 mV 0.7 mV 0.71 mV 0.71 mV 1.9 mV 1.9 mV	Fluke 5522A
	33 to 330 V Up to 45 Hz 45 Hz to 1 kHz (1 to 10) kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.012 V 0.013 V 0.013 V 0.014 V 0.062 V 0.099 V	
	330 to 1020 V Up to 45 Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.038 V 0.037 V 0.042 V 0.037 V	
AC Voltage - Measure	Up to 10 mV (1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz	0.0068 mV 0.0075 mV 0.014 mV 0.06 mV 0.47 mV 0.47 mV	HP 3458A Option 2
	(10 to 100) mV (1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz 300 kHz to 1 MHz (1 to 2) MHz	0.015 mV 0.012 mV 0.02 mV 0.038 mV 0.095 mV 0.36 mV 1.2 mV 1.8 mV	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage - Measure	100 mV to 1 V		HP 3458A Option 2
	(1 to 40) Hz	0.12 mV	
	40 Hz to 1 kHz	0.12 mV	
	(1 to 20) kHz	0.12 mV	
	(20 to 50) kHz	0.37 mV	
	(50 to 100) kHz	0.95 mV	
	(100 to 300) kHz	0.003 6 V	
300 kHz to 1 MHz	0.012 V		
	(1 to 2) MHz	0.018 V	
AC Current - Source	(1 to 10) V		Fluke 5522A
	(1 to 40) Hz	5.2 mV	
	40 Hz to 1 kHz	5.1 mV	
	(1 to 20) kHz	5.4 mV	
	(20 to 50) kHz	6.3 mV	
	(50 to 100) kHz	0.011 V	
	(100 to 300) kHz	0.037 V	
	300 kHz to 1 MHz	0.12 V	
	(10 to 100) V		
	(1 to 40) Hz	0.029 V	
	40 Hz to 1 kHz	0.028 V	
	(1 to 20) kHz	0.026 V	
	(20 to 50) kHz	0.044 V	
	(50 to 100) kHz	0.15 V	
	(100 to 300) kHz	0.48 V	
	300 kHz to 1 MHz	1.8 V	
	(100 to 1 000) V		
	Up to 40 Hz	0.52 V	
	40 Hz to 1 kHz	0.49 V	
	(1 to 20) kHz	0.72 V	
(20 to 50) kHz	1.5 V		
(50 to 100) kHz	3.5 V		
Up to 330 μ A			
Up to 10 Hz	1.2 μ A		
(10 to 45) Hz	0.7 μ A		
45 Hz to 1 kHz	1.6 μ A		
(1 to 5) kHz	3.9 μ A		
(5 to 10) kHz	7.7 μ A		
(10 to 30) kHz	7.7 μ A		

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Current - Source	330 μ A to 3.3 mA Up to 10 Hz (10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.014 mA 0.009 7 mA 0.007 9 mA 0.031 mA 0.061 mA 0.061 mA	Fluke 5522A
	(3.3 to 33) mA Up to 10 Hz 10 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.071 mA 0.033 mA 0.08 mA 0.16 mA 0.16 mA	
	(33 to 330) mA Up to 10 Hz (10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.72 mA 0.18 mA 0.44 mA 0.88 mA 1.8 mA 1.8 mA	
	(0.33 to 1.1) A Up to 10 Hz (10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.24 mA 0.17 mA 1.2 mA 5.8 mA 5.8 mA	
	(1.1 to 3) A Up to 10 Hz (10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.73 mA 0.37 mA 1.3 mA 5.9 mA 6 mA	
	(3 to 11) A Up to 45 Hz (45 to 65) Hz (65 to 500) Hz 500 Hz to 1 kHz (1 to 5) kHz	2.7 mA 2.7 mA 2.8 mA 3.2 mA 4.9 mA	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Current - Source	(11 to 20.5) A Up to 45 Hz (45 to 65) Hz (65 to 500) Hz 500 Hz to 1 kHz (1 to 5) kHz	0.007 A 0.007 A 0.007 A 0.0076 A 0.012 A	Fluke 5522A
AC Current - Measure	Up to 100 μ A Up to 20 Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz	0.5 μ A 0.21 μ A 0.11 μ A 0.18 μ A	HP 3458A Opt 2 w/ Agilent 34330A Current Shunt for values over 1 A
	100 μ A to 100 mA Up to 20 Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz (5 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.2 mA 0.093 mA 0.093 mA 0.093 mA 0.51 mA 0.47 mA 0.81 mA	
	100 mA to 1 A Up to 20 Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz (5 to 10) kHz	0.016 A 0.0063 A 0.017 A 0.018 A 0.0073 A	
	(1 to 5) A Up to 1 kHz (1 to 5) kHz	0.17 A 0.17 A	
	(5 to 10) A Up to 1 kHz (1 to 5) kHz	0.032 A 0.16 A	
	(10 to 20) A Up to 1 kHz (1 to 5) kHz	0.061 A 0.16 A	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Resistance - Source	Up to 10 Ω	0.012 Ω	Fluke 5522A
	(10 to 100) Ω	0.021 Ω	
	(100 Ω to 1.0 k Ω)	0.023 k Ω	
	(1.0 to 10.0) k Ω	0.12 k Ω	
	(10.0 to 100.0) k Ω	1.2 k Ω	
	100.0 k Ω to 1.0 M Ω	0.05 k Ω	
	(1.0 to 10.0) M Ω	0.0019 M Ω	
(10.0 to 100.0) M Ω	0.063 M Ω		
	100.0 to 1.0 G Ω	0.024 G Ω	
Resistance - Sense	Up to 10.0 Ω	0.28 m Ω	HP 3458A Option 2
	(10.0 to 100.0) Ω	0.0026 Ω	
	100.0 Ω to 1.0 k Ω	0.016 Ω	
	(1.0 to 10.0) k Ω	0.00016 k Ω	
	(10.0 to 100.0) k Ω	0.0017 k Ω	
	100.0 k Ω to 1.0 M Ω	0.024 k Ω	
	(1.0 to 10.0) M Ω	0.74 k Ω	
	(10.0 to 100.0) M Ω	0.06 M Ω	
Electrical Temperature Simulation Type B	(600 to 800) $^{\circ}\text{C}$	0.38 $^{\circ}\text{C}$	Fluke 5522A
	(800 to 1 000) $^{\circ}\text{C}$	0.32 $^{\circ}\text{C}$	
	(1 000 to 1 550) $^{\circ}\text{C}$	0.29 $^{\circ}\text{C}$	
	(1 550 to 1 820) $^{\circ}\text{C}$	0.36 $^{\circ}\text{C}$	
Type E	(-250 to -100) $^{\circ}\text{C}$	0.41 $^{\circ}\text{C}$	Fluke 5522A
	(-100 to -25) $^{\circ}\text{C}$	0.18 $^{\circ}\text{C}$	
	(-25 to 350) $^{\circ}\text{C}$	0.17 $^{\circ}\text{C}$	
	(350 to 650) $^{\circ}\text{C}$	0.18 $^{\circ}\text{C}$	
	(650 to 1 000) $^{\circ}\text{C}$	0.21 $^{\circ}\text{C}$	
Type J	(-210 to -100) $^{\circ}\text{C}$	0.25 $^{\circ}\text{C}$	Fluke 5522A
	(-100 to -30) $^{\circ}\text{C}$	0.18 $^{\circ}\text{C}$	
	(-30 to 150) $^{\circ}\text{C}$	0.17 $^{\circ}\text{C}$	
	(150 to 760) $^{\circ}\text{C}$	0.19 $^{\circ}\text{C}$	
	(760 to 1 200) $^{\circ}\text{C}$	0.22 $^{\circ}\text{C}$	
Type K	(-200 to -100) $^{\circ}\text{C}$	0.29 $^{\circ}\text{C}$	Fluke 5522A
	(-100 to -25) $^{\circ}\text{C}$	0.19 $^{\circ}\text{C}$	
	(-25 to 120) $^{\circ}\text{C}$	0.18 $^{\circ}\text{C}$	
	(120 to 1 000) $^{\circ}\text{C}$	0.24 $^{\circ}\text{C}$	
	(1 000 to 1 372) $^{\circ}\text{C}$	0.34 $^{\circ}\text{C}$	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Electrical Temperature Simulation Type N	(-200 to -100) °C	0.34 °C	Fluke 5522A
	(-100 to -25) °C	0.21 °C	
	(-25 to 120) °C	0.20 °C	
	(120 to 410) °C	0.19 °C	
	(410 to 1 300) °C	0.25 °C	
Type R	(0 to 250) °C	0.46 °C	
	(250 to 400) °C	0.30 °C	
	(400 to 1000) °C	0.31 °C	
	(1000 to 1767) °C	0.36 °C	
Type S	(0 to 250) °C	0.39 °C	
	(250 to 1000) °C	0.35 °C	
	(1000 to 1400) °C	0.34 °C	
	(1400 to 1767) °C	0.41 °C	
Type T	(-250 to -150) °C	0.51 °C	
	(-150 to 0) °C	0.23 °C	
	(0 to 120) °C	0.18 °C	
	(120 to 400) °C	0.17 °C	

Time and Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
RPM Measurement ¹	(6 to 8 300) RPM (8 300 to 19 000) RPM	2.2 RPM 2.9 RPM	Shimpo Tachometer

Calibration and Measurement Capability (CMC) is expressed in terms of the measurement parameter, measurement range, expanded uncertainty of measurement and reference standard, method, and/or equipment. The expanded uncertainty of measurement is expressed as the standard uncertainty of the measurement multiplied by a coverage factor of 2 ($k=2$), corresponding to a confidence level of approximately 95%.

Notes:

1. On-site calibration service is available for this parameter, since on-site conditions are typically more variable than those in the laboratory, larger measurement uncertainties are expected on-site than what is reported on the accredited scope.
2. This scope is formatted as part of a single document including Certificate of Accreditation No. AC-1452.



R. Douglas Leonard Jr., VP, PILR SBU