CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

Southwest Calibration Service, Inc.
13114 Mula Court
Stafford, TX 77477

Fulfills the requirements of

ISO/IEC 17025:2017

and national standard

ANSI/NCSL Z540-1-1994 (R2002)

In the field of

CALIBRATION

This certificate is valid only when accompanied by a current scope of accreditation document.
The current scope of accreditation can be verified at www.anab.org.

Jason Stine, Vice President

Expiry Date: 05 June 2025
Certificate Number: L2165

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

AND

ANSI/NCSL Z540-1-1994 (R2002)

Southwest Calibration Service, Inc.
13114 Mula Court
Stafford, TX 77477
Reid Davidson 281-879-1713

CALIBRATION

Valid to: **June 5, 2025** Certificate Number: **L2165**

Electrical – DC/Low Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
DC Current – Source [1]	(0 to 200) µA 200 µA to 2 mA (2 to 20) mA (20 to 200) mA 200 mA to 2A (2 to 20) A	3 µA/A + 7.8 nA 8.5 µA/A + 20 nA 13 µA/A + 0.11 µA 41 µA/A + 1.7 µA 0.16 mA/A + 30 µA 0.36 mA/A + 1.2 mA	Fluke 5520A Multifunction Calibrator, Fluke 8508A 8.5 Digit Multimeter
DC Current – Measure [1]	(0 to 200) µA (0.2 to 2) mA (2 to 20) mA (20 to 200) mA (0.2 to 2) A (2 to 20) A	3 µA/A + 7.8 nA 12 µA/A + 8.8 nA 14 µA/A + 58 nA 41 µA/A + 1.4 µA 0.17 mA/A + 22 µA 0.37 mA/A + 1 mA	Fluke 8508A 8.5 Digit Multimeter
AC Current – Source [1]	2 µA to 200 µA 10 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz 200 µA to 2 mA 10 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz 2 mA to 20 mA 10 Hz to 5 kHz (5 to 10) kHz	 0.15 mA/A + 80 nA 0.1 mA/A + 0.12 µA 0.1 mA/A + 0.16 µA 0.25 mA/A + 0.23 µA 0.25 mA/A + 0.23 µA 0.22 mA/A + 0.31 µA 0.25 mA/A + 2.5 µA 0.23 mA/A + 3.1 µA	Fluke 5520A Multifunction Calibrator, Fluke 8508A 8.5 Digit Multimeter

Electrical – DC/Low Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
AC Current – Source [1]	20 mA to 200 mA 10 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	 0.25 mA/A + 25 µA 0.2 mA/A + 44 µA 0.15 mA/A + 80 µA	Fluke 5520A Multifunction Calibrator, Fluke 8508A 8.5 Digit Multimeter
AC Current – Source [1]	200 mA to 2 A 10 Hz to 1 kHz (1 to 2) kHz 200 mA to 2 A (2 to 5) kHz (5 to 10) kHz 2 A to 20 A 45 Hz to 2 kHz (2 to 5) kHz	 0.6 mA/A + 0.21 mA 0.7 mA/A + 0.8 mA 0.8 mA/A + 0.8 mA 2.4 mA/A + 3.9 mA 0.81 mA/A + 2.5 mA 2.5 mA/A + 2.6 mA	Fluke 5520A Multifunction Calibrator, Fluke 8508A 8.5 Digit Multimeter
AC Current – Source [1]	(45 to 100) Hz (0.33 to 1.1) A (1.1 to 3) A (3 to 11) A (11 to 20.5) A	 0.42 mA/A + 82 µA 0.76 mA/A + 0.22 mA 0.5 mA/A + 1.6 mA 0.92 mA/A + 4.5 mA	Fluke 5520A Multifunction Calibrator
AC Current – Measure [1]	10 Hz to 10 kHz (2 to 200) µA 200 µA to 2 mA (2 to 20) mA (20 to 200) mA 10 Hz to 2 kHz 200 mA to 2 A (2 to 20) A (2 to 10) kHz 200 mA to 2 A	 0.62 mA/A + 30 nA 0.31 mA/A + 0.22 µA 0.33 mA/A + 1.5 µA 0.3 mA/A + 20 µA 0.63 mA/A + 0.2 mA 0.84 mA/A + 2.1 mA 0.87 mA/A + 0.21 mA	Fluke 8508A 8.5 Digit Multimeter
Resistance – Measure [1]	Up to 2 Ω (2 to 20) Ω (20 to 200) Ω (0.2 to 2) kΩ (2 to 20) kΩ (20 to 200) kΩ (0.2 to 2) MΩ (2 to 20) MΩ (20 to 200) MΩ (0.2 to 2) GΩ	19.5 µΩ/Ω + 4.2 µΩ 3.2 µΩ/Ω + 27.3 µΩ 8.2 µΩ/Ω + 44.8 µΩ 8.1 µΩ/Ω + 0.45 mΩ 8.1 µΩ/Ω + 5 mΩ 8.4 µΩ/Ω + 68 mΩ 11.3 µΩ/Ω + 0.8 Ω 22.6 µΩ/Ω + 90 Ω 0.12 mΩ/Ω + 9.3 kΩ 1.44 mΩ/Ω + 0.93 MΩ	Fluke 8508A 8.5 Digit Multimeter

Electrical – DC/Low Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Resistance – Source [1] (2-wire Simulation Only)	Up to 11 Ω (11 to 33) Ω (33 to 110) Ω 110 Ω to 1.1 kΩ (1.1 to 11) kΩ (11 to 110) kΩ	31 µΩ/Ω + 4.7 mΩ 24 µΩ/Ω + 5.1 mΩ 22 µΩ/Ω + 5.1 mΩ 23 µΩ/Ω + 5.5 mΩ 24 µΩ/Ω + 53 mΩ 23 µΩ/Ω + 612 mΩ	Fluke 5520A Multifunction Calibrator
Resistance – Source [1] (2-wire or 4-wire Simulation)	(0.11 to 1.1) MΩ (1.1 to 3.3) MΩ (3.3 to 11) MΩ (11 to 33) MΩ (33 to 110) MΩ (110 to 330) MΩ (330 to 600) MΩ	24 µΩ/Ω + 2.4 Ω 58 µΩ/Ω + 16 Ω 104 µΩ/Ω + 36 Ω 0.22 mΩ/Ω + 2.2 kΩ 0.38 mΩ/Ω + 5.5 kΩ 2.3 mΩ/Ω + 98 kΩ 12 mΩ/Ω + 0.55 MΩ	Fluke 5520A Multifunction Calibrator
Resistance – Source [1] (4-wire Simulation Only)	Up to 11 Ω (11 to 33) Ω (33 to 110) Ω (0.11 to 1.1) kΩ (1.1 to 11) kΩ (11 to 110) kΩ	28 µΩ/Ω + 0.1 mΩ 24 µΩ/Ω + 1.3 mΩ 22 µΩ/Ω + 1.3 mΩ 23 µΩ/Ω + 1.6 mΩ 27 µΩ/Ω + 11 mΩ 22 µΩ/Ω + 0.29 Ω	Fluke 5520A Multifunction Calibrator
DC Voltage – Source [1]	(0 to 200) mV (0.2 to 2) V (2 to 20) V (20 to 200) V (200 to 1 000) V	2.7 µV/V + 0.87 µV 2.8 µV/V + 1.6 µV 3.2 µV/V + 9 µV 4.9 µV/V + 0.13 mV 4.5 µV/V + 1.3 mV	Fluke 5520A Multifunction Calibrator, Fluke 8508A 8.5 Digit Multimeter
DC Voltage – Measure [1]	(0 to 200) mV (0.2 to 2) V (2 to 20) V (20 to 200) V (200 to 1 000) V	3.5 µV/V + 0.71 µV 2.9 µV/V + 1.4 µV 3.3 µV/V + 5.9 µV 4.9 µV/V + 0.12 mV 4.2 µV/V + 1.2 mV	Fluke 8508A 8.5 Digit Multimeter
AC Voltage – Source [1]	(2 to 200) mV (10 to 40) Hz (40 to 100) Hz 100 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz	 0.12 mV/V + 9.5 µV 0.1 mV/V + 6.9 µV 0.1 mV/V + 4.4 µV 0.1 mV/V + 7.3 µV 0.3 mV/V + 14 µV 0.69 mV/V + 31 µV	Fluke 5520A Multifunction Calibrator, Fluke 8508A 8.5 Digit Multimeter

Electrical – DC/Low Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
AC Voltage – Source [1]	20 mV to 2 V (10 to 40) Hz (40 to 100) Hz 100 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz (100 to 300) kHz	 98 µV/V + 53 µV 79 µV/V + 54 µV 62 µV/V + 37 µV 85 µV/V + 45 µV 0.2 mV/V + 83 µV 0.49 mV/V + 0.32 mV 2.8 mV/V + 2.8 mV	Fluke 5520A Multifunction Calibrator, Fluke 8508A 8.5 Digit Multimeter
AC Voltage – Source [1]	(0.2 to 20) V (10 to 40) Hz (40 to 100) Hz 100 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz (2 to 200) V (45 to 100) Hz 100 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz (200 to 330) V 45 Hz to 1 kHz (1 to 10) kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz	 97 µV/V + 0.58 mV 79 µV/V + 0.47 mV 63 µV/V + 0.37 mV 88 µV/V + 0.44 mV 0.2 mV/V + 0.66 V 0.5 mV/V + 3 mV 81 µV/V + 4.3 mV 63 µV/V + 3.7 mV 85 µV/V + 4.2 mV 202 µV/V + 6.6 mV 0.48 mV/V + 35 mV 0.12 mV/V + 14 mV 0.14 mV/V + 11 mV 0.15 mV/V + 23 mV 91 µV/V + 0.1 V 1.3 mV/V + 0.16 V	Fluke 5520A Multifunction Calibrator, Fluke 8508A 8.5 Digit Multimeter
	(330 to 1 020) V 45 Hz to 10 kHz	 0.21 mV/V + 35 mV	Fluke 5520A Multifunction Calibrator
AC Voltage – Measure [1]	(2 to 200) mV (10 to 40) Hz (40 to 100) Hz 100 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz	 0.16 mV/V + 5.6 µV 0.12 mV/V + 5.6 µV 0.12 mV/V + 4.4 µV 0.15 mV/V + 5.6 µV 0.35 mV/V + 8.9 µV 0.78 mV/V + 21 µV	Fluke 8508A 8.5 Digit Multimeter

Electrical – DC/Low Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
AC Voltage – Measure [1]	20 mV to 2 V		Fluke 8508A 8.5 Digit Multimeter
	(10 to 40) Hz	0.13 mV/V + 21 µV	
	(40 to 100) Hz	99 µV/V + 21 µV	
	100 Hz to 2 kHz	79 µV/V + 21 µV	
	(2 to 10) kHz	0.12 mV/V + 21 µV	
	(10 to 30) kHz	0.23 mV/V + 41 µV	
	(30 to 100) kHz	0.59 mV + 0.2 mV	
	(100 to 300) kHz	3.1 mV/V + 2 mV	
	300 kHz to 1MHz	10.2 mV/V + 20 mV	
	(0.2 to 20) V		
	(10 to 40) Hz	0.13 mV/V + 0.21 mV	
	(40 to 100) Hz	0.1 mV/V + 0.21 mV	
	100 Hz to 2 kHz	79 µV/V + 0.21 mV	
	(2 to 10) kHz	0.12 mV/V + 0.21 mV	
	(10 to 30) kHz	0.24 mV/V + 0.19 mV	
	(30 to 100) kHz	0.58 mV/V + 2 mV	
	(100 to 300) kHz	3 mV/V + 20 mV	
	300 kHz to 1 MHz	10.2 mV/V + 0.2 V	
	(2 to 200) V		
	(10 to 40) Hz	0.13 mV/V + 2 mV	
	(40 to 100) Hz	0.11 mV/V + 2 mV	
	100 Hz to 2 kHz	90 µV/V + 2 mV	
	(2 to 10) kHz	0.12 mV/V + 2 mV	
	(10 to 30) kHz	0.23 mV/V + 4 mV	
	(30 to 100) kHz	0.58 mV/V + 20 mV	
	(200 to 1 050) V		
	40 Hz to 10 kHz	0.16 mV/V + 21 mV	
	(10 to 30) kHz	0.35 mV/V + 41 mV	
Electrical Simulation of Thermocouple Indicating Devices – Source/Measure [1]	Type J		Fluke 5520A Multifunction Calibrator
	(-210 to -100) °C	0.31 °C	
	(-100 to -30) °C	0.26 °C	
	(-30 to 150) °C	0.26 °C	
	(150 to 760) °C	0.27 °C	
	(760 to 1 200) °C	0.29 °C	
	Type K		
	(-200 to -100) °C	0.35 °C	
	(-100 to -25) °C	0.27 °C	
	(-25 to 120) °C	0.26 °C	
	(120 to 1 000) °C	0.31 °C	
	(1 000 to 1 372) °C	0.39 °C	

Electrical – DC/Low Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Electrical Simulation of Thermocouple Indicating Devices – Source/Measure [1]	Type R (0 to 250) °C (250 to 400) °C (400 to 1 000) °C (1 000 to 1 767) °C Type T (-250 to -150) °C (-150 to 0) °C (0 to 120) °C (120 to 400) °C	 0.5 °C 0.36 °C 0.35 °C 0.39 °C 0.54 °C 0.3 °C 0.26 °C 0.26 °C	Fluke 5520A Multifunction Calibrator
Oscilloscopes [1] Time Markers Rise Time DC Output Square Wave Voltage Sine Wave Flatness	 2 GHz to 10 ms 150 ps 4.44 mV to 222.4 V 10 Hz to 10 kHz (35.52 to 999.9) µVp-p (1 to 21) mVp-p (21.001 to 556) mVp-p 556 mVp-p to 210 Vp-p 100 kHz to 1.1 GHz 4.44 mVp-p to 5.56 Vp-p	 0.25 µs 33 ps 0.25 mV/V + 25 µV 9.9 mV/V + 10 µV 1 mV/V + 15 µV 1 mV/V + 1 µV 0.5 mV/V + 1 µV 39 µV/mV	Fluke 9500B/9520/9530 Oscilloscope Calibrator

Length – Dimensional Metrology

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Cylindrical Rings [2]	(0.04 to 13) in	(12 + 2*L*) µin	Master Gage Blocks, Labmaster Universal
Cylindrical Plugs [2]	Up to 10 in	(42 + 4.9*L*) µin	Gage Blocks, Supermicrometer
Gage Blocks [2]	(0.05 to 1) in (1 to 4) in (4 to 20) in	(3.2 + 1.1L) µin (2.3 + 2*L*) µin (1.4 + 2.4*L*) µin	Master Gage Blocks, Gage Block Comparator
Length Standards [2] (Micrometer)	(1 to 48) in	(66 + 3.4*L*) µin	Standard Measuring Machine or LMU, Gage Blocks

Length – Dimensional Metrology

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Surface Plates [1,2]			In accordance with ASME B89.3.7 using Electronic Level System
Overall Flatness	Up to 108 in*DL* (108 to 188) in*DL*	(13 + 1.2*DL*) µin (80 + 0.42*DL*) µin	
Local Area Flatness	± 0.001 in	29 µin	Repeat-O-Meter
Thread Wires			Master Thread Wires, LMU
60°	(4 to 80) TPI	13 µin	
29°	(1 to 20) TPI	13 µin	
Thread Plugs [2]			Supermicrometer, Gage Blocks, Thread Wires
Pitch Diameter	(0.04 to 10) in	(100 + 4.5*L*) µin	
Major Diameter	(0.04 to 10) in	(55 + 6.7*L*) µin	
Taper Thread Plugs [2] (NPT, L1, L3, ANPT, NPTF) Pitch Diameter	Up to 10 in	(250 + 7.1*L*) µin	Supermicrometer, Gage Blocks, Thread Measuring Wires
Thread Rings [2]			Thread Plug Set Digital Bore Mics, Cylindrical Rings
Pitch Diameter	(0.04 to 10) in	(330 + 70*L*) µin	
Minor Diameter	(0.08 to 8) in	(200 + 31*L*) µin	
Taper Thread Ring (inch)			Master Plug, Mu-Checker, Height Gage
NPT	Up to 0.75 in	0.009 2 in	
Standoff	(1 to 2) in	0.01 in	
	(2.5 to 8) in	0.014 in	
API Standoff			Master Gages, Gage Blocks, Depth Micrometer
Spec 5B	As Specified	0.002 in	
Spec 7		490 µin	
Calipers [1,2]			Gage Blocks Cylindrical Rings
Outside Jaws			
(0.001 in Resolution)	Up to 48 in	0.001 in	
(0.000 5 in Resolution)	Up to 24 in	(557 + 0.7*L*) µin	
	(24 to 48) in	0.001 in	
Inside Jaws			
(0.001 in Resolution)	Up to 4 in	0.001 in	
(0.000 5 in Resolution)	Up to 4 in	572 µin	
Depth Bar / Front Step			
(0.001 in Resolution)	Up to 4 in	0.001 in	
(0.000 5 in Resolution)	Up to 4 in	531 µin	
Height Gages [1,2]			Gage Blocks
(0.001 in Resolution)	Up to 40 in	(610 + 0.64*L*) µin	
(0.000 5 in Resolution)	Up to 40 in	(430 + 0.88*L*) µin	
(0.000 1 in Resolution)	Up to 40 in	(140 + 2.1*L*) µin	

Length – Dimensional Metrology

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Indicators [1,2] (0.001 in Resolution) (0.000 5 in Resolution) (0.000 1 in Resolution)	 Up to 1 in Up to 1 in Up to 1 in	 600 µin 320 µin 58 µin	Dial Indicator Calibrator, Gage Blocks
Micrometers-Bore (3 point) [1,2] (0.000 2 in Resolution) (0.000 1 in Resolution) (0.000 05 in Resolution)	 (0.25 to 8) in (0.25 to 8) in (0.25 to 8) in	 (150 + 15*L*) µin (120 + 132*L*) µin (76 + 16*L*) µin	Cylindrical Rings
Micrometers-Depth [1,2] (0.001 in Resolution) (0.000 1 in Resolution) (0.000 05 in Resolution)	 Up to 12 in Up to 12 in Up to 12 in	 (590 + 4.5*L*) µin (140 + 13*L*) µin (52 + 19*L*) µin	Gage Blocks, Depth Gage Master
Micrometers-Inside [1,2]	Up to 48 in	(430 + 1.4*L*) µin	Gage Blocks, Supermicrometer or Standard Measuring Machine
Micrometers-Outside [1,2] (0.001 in Resolution) (0.000 1 in Resolution) (0.000 05 in Resolution)	 Up to 24 in Up to 24 in Up to 24 in	 (580 + 1.1*L*) µin (67 + 4.7*L*) µin (62 + 3.9*L*) µin	Gage Blocks

Mass and Mass Related

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Leak Standards	(0.5 to 1) sccm (-13 to -1.5) psig (-1.5 to -0.25) psig (-0.25 to -0.1) psig (0.1 to 0.25) psig (0.25 to 1.5) psig (1.5 to 1 000) psig (1 to 5 000) sccm (-13 to -1.5) psig (-1.5 to -0.25) psig (-0.25 to -0.1) psig (0.1 to 0.25) psig (0.25 to 1.5) psig (1.5 to 1 000) psig	 0.011 sccm 0.014 sccm 0.027 sccm 0.027 sccm 0.014 sccm 0.011 sccm 0.96 % of reading + 0.001 2 sccm 1.3 % of reading + 0.001 sccm 2.7 % of reading + 0.001 sccm 2.7 % of reading + 0.001 sccm 1.3 % of reading + 0.001 sccm 0.96 % of reading + 0.001 2 sccm	CPC6000 Pressure Controller, Master Flow Sensors

Mass and Mass Related

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Rockwell Hardness Testers [1]	HRC Low Medium High	 0.95 HRC 0.8 HRC 0.75 HRC	Indirect Verification per ASTM E18 using Hardness Test Blocks.
Rockwell Hardness Testers [1]	HRBW Low Medium High	 1.3 HRBW 1.2 HRBW 1 HRBW	Indirect Verification per ASTM E18 using Hardness Test Blocks.
Durometers Type A (1 Duro Resolution) Spring Calibration Indenter Calibration	(1 to 100) Duro	 0.88 Duro 0.75 Duro	DuroCalibrator, Gage Blocks
Type A (5 Duro Resolution) Spring Calibration Indenter Calibration		 3.8 Duro 3.8 Duro	
Type D (1 Duro Resolution) Spring Calibration Indenter Calibration	(1 to 100) Duro	 0.88 Duro 0.75 Duro	
Type D (5 Duro Resolution) Spring Calibration Indenter Calibration		 3.8 Duro 3.8 Duro	
Mass Determination (SI)	(0.001 to 30) g (30 to 250) g (250 to 1 100) g (1 100 to 10 000) g	0.046 mg + 0.002 2 mg/g 0.22 mg + 0.001 7 mg/g 0.71 mg + 0.001 8 mg/g 2.3 mg + 0.002 2 mg/g	Precision Balances, Master Masses
Hydraulic Pressure [1]	Up to 12 000 psig Up to 25 000 psig Up to 40 000 psig	3.2 psi 6.4 psi 10 psi	Ruska 7230 Pressure Controller
Hydraulic Pressure	(14.5 to 1 450) psig (145 to 14 500) psig (290 to 29 000) psig (725 to 72 500) psig	0.002 1 % of reading + 0.005 psi 0.002 6 % of reading + 0.006 psi 0.003 6 % of reading + 0.007 psi 0.005 4 % of reading + 0.012 psi	DHI PG7302 Piston Gauge
Hydraulic Pressure	(29.5 to 1 465) psia (145 to 14 500) psia (290 to 29 000) psia (725 to 72 500) psia	0.002 1 % of reading + 0.034 psi 0.002 6 % of reading + 0.034 psi 0.003 6 % of reading + 0.034 psi 0.005 4 % of reading + 0.036 psi	DHI PG7302 Piston Gauge
Pneumatic Gauge Pressure	(-1 to 1) psig (-5 to 5) psig	0.000 4 psi 0.002 1 psi	Mensor CPC6000 Pressure Controller
	(-14.7 to 15) psig (15 to 30) psig	0.002 4 psi 0.015 % of reading + 0.000 2 psi	

Mass and Mass Related

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Pneumatic Gauge Pressure	(0 to 50) psig (50 to 100) psig	0.007 9 psi 0.015 % of reading + 0.000 2 psi	Mensor CPC6000 Pressure Controller
	(0 to 150) psig (150 to 300) psig	0.023 psi 0.015 % of reading + 0.000 5 psi	
	(0 to 500) psig (500 to 1 000) psig	0.097 psi 0.017 % of reading + 0.013 psi	
	(-5 to 5) psig	0.000 8 % of reading + 0.000 027 psi	Dual Ruska 2465A Piston Gauges
	(-15 to -0.5) psig (0.5 to 100) psig (100 to 1 000) psig	0.001 7 % of reading + 0.000 008 psi 0.001 6 % of reading + 0.000 008 psi 0.00 29 % of reading + 0.000 003 psi	Ruska 2465A Piston Gauge
Pneumatic Absolute Pressure	(0.5 to 100) psia	0.001 5 % of reading + 0.000 14 psi	Ruska 2465A Piston Gauge, Vacuum Sensor
	(100 to 1 015) psia	0.002 7 % of reading + 0.001 3 psi	Ruska 2465A Piston Gauge, Barometer
Torque Wrench [1,2]	(10 to 100) ozf·in (10 to 100) lbf·in (30 to 300) lbf·in (10 to 100) lbf·ft (25 to 250) lbf·ft (100 to 1 000) lbf·ft	1.9 % of reading + 0.09 ozf·in 0.5 % of reading + 0.3 lbf·in 0.67 % of reading + 0.29 lbf·in 0.4 % of reading + 0.31 lbf·ft 0.8 % of reading + 0.07 lbf·ft 0.6 % of reading + 0.15 lbf·ft	Torque Calibration System

Thermodynamic

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Temperature – Source [1]	(-50 to 0) °C (0 to 100) °C (100 to 200) °C (200 to 300) °C	0.032 °C 0.037 °C 0.046 °C 0.059 °C	Liquid Baths, Fluke 8508A 8.5 Digit Multimeter, Secondary Standard PRT
	(300 to 600) °C	0.21 °C	Drywell Calibrator, Fluke 8508A 8.5 Digit Multimeter, Secondary Standard PRT
	(600 to 1 200) °C	0.042 % of reading + 0.44 °C	TC Furnace, Fluke 8508A 8.5 Digit Multimeter, Type S Thermocouple

Thermodynamic

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Temperature – Measure [1]	(-50 to 0) °C (0 to 100) °C (100 to 200) °C (200 to 600) °C	0.024 °C 0.032 °C 0.043 °C 0.059 °C	Fluke 8508A 8.5 Digit Multimeter, Secondary Standard PRT
	(600 to 1 200) °C	0.055 % of reading + 0.17 °C	Fluke 8508A 8.5 Digit Multimeter, Type S Thermocouple
Humidity – Source	10 % RH (20 to 50) % RH (50 to 90) % RH	0.59 % RH 0.61 % RH 0.63 % RH	Thunder Scientific 2500 Two-Pressure Humidity Generator

Time and Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Frequency – Source [1]	1 mV to 33 V 10 mHz to 100 kHz (0.3 to 3.3) V 100 kHz to 2 MHz	0.26 nHz/Hz + 45 µHz 0.55 nHz/Hz + 0.2 µHz	Fluke 5520A Multifunction Calibrator, SR 625 Counter (Gate locked at 10 MHz)
Frequency – Measure [1]	20 mV to 30 V 1 mHz to 300 MHz	0.51 nHz/Hz + 4.4 µHz	Stanford Research 625 Frequency Counter

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. L = length in inches, DL = diagonal length in inches.
3. This scope is formatted as part of a single document including Certificate of Accreditation No. L2165.

Jason Stine, Vice President