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 2027
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, 2027** Certificate Number: **L2165**

Electrical – DC/Low Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
DC Current – Source [1]	Up 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	Comparison to Fluke 5520A Multifunction Calibrator, Fluke 8508A 8.5 Digit Multimeter
DC Current – Measure [1]	Up 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	Comparison to 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	Comparison to 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 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	 0.25 mA/A + 25 µA 0.2 mA/A + 44 µA 0.15 mA/A + 80 µA 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	Comparison to 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	Comparison to 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	Comparison to 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	Comparison to 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	Comparison to 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	Comparison to 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	Comparison to 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	Comparison to 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	Comparison to 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	Comparison to 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		Comparison to Fluke 5520A Multifunction Calibrator, Fluke 8508A 8.5 Digit Multimeter
	(10 to 40) Hz	98 µV/V + 53 µV	
	(40 to 100) Hz	79 µV/V + 54 µV	
	100 Hz to 2 kHz	62 µV/V + 37 µV	
	(2 to 10) kHz	85 µV/V + 45 µV	
	(10 to 30) kHz	0.2 mV/V + 83 µV	
	(30 to 100) kHz	0.49 mV/V + 0.32 mV	
	(100 to 300) kHz	2.8 mV/V + 2.8 mV	
	(0.2 to 20) V		
	(10 to 40) Hz	97 µV/V + 0.58 mV	
	(40 to 100) Hz	79 µV/V + 0.47 mV	
	100 Hz to 2 kHz	63 µV/V + 0.37 mV	
	(2 to 10) kHz	88 µV/V + 0.44 mV	
	(10 to 30) kHz	0.2 mV/V + 0.66 V	
	(30 to 100) kHz	0.5 mV/V + 3 mV	
	(2 to 200) V		
	(45 to 100) Hz	81 µV/V + 4.3 mV	
	100 Hz to 2 kHz	63 µV/V + 3.7 mV	
	(2 to 10) kHz	85 µV/V + 4.2 mV	
	(10 to 30) kHz	202 µV/V + 6.6 mV	
	(30 to 100) kHz	0.48 mV/V + 35 mV	
	(200 to 330) V		
	45 Hz to 1 kHz	0.12 mV/V + 14 mV	
	(1 to 10) kHz	0.14 mV/V + 11 mV	
	(10 to 20) kHz	0.15 mV/V + 23 mV	
	(20 to 50) kHz	91 µV/V + 0.1 V	
	(50 to 100) kHz	1.3 mV/V + 0.16 V	
AC Voltage – Source [1]	(330 to 1 020) V 45 Hz to 10 kHz	0.21 mV/V + 35 mV	Comparison to Fluke 5520A Multifunction Calibrator
AC Voltage – Measure [1]	(2 to 200) mV		Comparison to Fluke 8508A 8.5 Digit Multimeter
	(10 to 40) Hz	0.16 mV/V + 5.6 µV	
	(40 to 100) Hz	0.12 mV/V + 5.6 µV	
	100 Hz to 2 kHz	0.12 mV/V + 4.4 µV	
	(2 to 10) kHz	0.15 mV/V + 5.6 µV	
	(10 to 30) kHz	0.35 mV/V + 8.9 µV	
	(30 to 100) kHz	0.78 mV/V + 21 µV	

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		Comparison to 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		Comparison to 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	Comparison to 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	Comparison to 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	Comparison to Master Gage Blocks, Labmaster Universal
Cylindrical Plugs [2]	Up to 10 in	(42 + 4.9*L*) µin	Comparison to 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	Comparison to Master Gage Blocks, Gage Block Comparator

Length – Dimensional Metrology

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Length Standards [2] (Micrometer)	(1 to 48) in	(66 + 3.4*L*) µin	Comparison to Standard Measuring Machine or LMU, Gage Blocks
Surface Plates [1,2] Overall Flatness Local Area Flatness	Up to 108 in*DL* (108 to 188) in*DL* ± 0.001 in	(13 + 1.2*DL*) µin (80 + 0.42*DL*) µin 29 µin	In accordance with ASME B89.3.7 using Electronic Level System Repeat-O-Meter
Thread Wires 60° 29°	 (4 to 80) TPI (1 to 20) TPI	 13 µin 13 µin	Comparison to Master Thread Wires, LMU
Thread Plugs [2] Pitch Diameter Major Diameter	 (0.04 to 10) in (0.04 to 10) in	 (100 + 4.5*L*) µin (55 + 6.7*L*) µin	Comparison to Supermicrometer®, Gage Blocks, Thread Wires
Taper Thread Plugs [2] (NPT, L1, L3, ANPT, NPTF) Pitch Diameter	 Up to 10 in	 (250 + 7.1*L*) µin	Comparison to Supermicrometer®, Gage Blocks, Thread Measuring Wires
Thread Rings [2] Pitch Diameter Minor Diameter	 (0.04 to 10) in (0.08 to 8) in	 (330 + 70*L*) µin (200 + 31*L*) µin	Comparison to Thread Plug Set Digital Bore Mics, Cylindrical Rings
Taper Thread Ring (inch) NPT Standoff	 Up to 0.75 in (1 to 2) in (2.5 to 8) in	 0.009 2 in 0.01 in 0.014 in	Comparison to Master Plug, Mu-Checker, Height Gage
API Standoff Spec 5B Spec 7	 As Specified	 0.002 in 490 µin	Comparison to Master Gages, Gage Blocks, Depth Micrometer

Length – Dimensional Metrology

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

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	Comparison to CPC6000 Pressure Controller, Master Flow Sensors
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 Spring Force Only Type A, D 1 Duro resolution 5 Duro resolution	 (1 to 100) Duro (1 to 100) Duro	 0.88 Duro 3.8 Duro	Partial Direct Verification per ASTM D2240 using Durometer Calibrator.
Mass Determination (SI)	(0.001 to 30) g (30 to 250) g (250 to 1 100) g (1 100 to 10 000) g	0.000 22 % of reading + 51 µg 0.000 22 % of reading + 0.2 mg 0.000 14 % of reading + 1.4 mg 0.000 21 % of reading + 7.1 mg	Comparison to Precision Balances, Master Weights
Hydraulic Gauge Pressure Devices [1]	Up to 12 000 psig Up to 25 000 psig Up to 40 000 psig	3.2 psi 6.4 psi 10 psi	Comparison to Ruska 7230 Pressure Controller
Hydraulic Gauge Pressure Devices	(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	Comparison to DHI PG7302 Piston Gauge
Hydraulic Gauge Pressure Devices	(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	Comparison to DHI PG7302 Piston Gauge

Mass and Mass Related

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Pneumatic Gauge Pressure Devices	(-1 to 1) psig (-5 to 5) psig	0.000 4 psi 0.002 1 psi	Comparison to Mensor CPC6000 Pressure Controller
Pneumatic Gauge Pressure Devices	(-14.7 to 15) psig (15 to 30) psig	0.002 4 psi 0.015 % of reading + 0.000 2 psi	Comparison to Mensor CPC6000 Pressure Controller
Pneumatic Gauge Pressure Devices	(0 to 50) psig (50 to 100) psig	0.007 9 psi 0.015 % of reading + 0.000 2 psi	Comparison to Mensor CPC6000 Pressure Controller
Pneumatic Gauge Pressure Devices	(0 to 150) psig (150 to 300) psig	0.023 psi 0.015 % of reading + 0.000 5 psi	Comparison to Mensor CPC6000 Pressure Controller
Pneumatic Gauge Pressure Devices	(0 to 500) psig (500 to 1 000) psig	0.097 psi 0.017 % of reading + 0.013 psi	Comparison to Mensor CPC6000 Pressure Controller
Pneumatic Gauge Pressure Devices	(-5 to 5) psig	0.000 8 % of reading + 0.000 027 psi	Comparison to Dual Ruska 2465A Piston Gauges
Pneumatic Gauge Pressure Devices	(-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	Comparison to Ruska 2465A Piston Gauge
Pneumatic Absolute Pressure Devices	(0.5 to 100) psia	0.001 5 % of reading + 0.000 14 psi	Comparison to Ruska 2465A Piston Gauge, Vacuum Sensor
Pneumatic Absolute Pressure Devices	(100 to 1 015) psia	0.002 7 % of reading + 0.001 3 psi	Comparison to 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	Comparison to 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	Comparison to Liquid Baths, Fluke 8508A 8.5 Digit Multimeter, Secondary Standard PRT
Temperature – Source [1]	(300 to 600) °C	0.21 °C	Comparison to Drywell Calibrator, Fluke 8508A 8.5 Digit Multimeter, Secondary Standard PRT
Temperature – Source [1]	(600 to 1 200) °C	0.042 % of reading + 0.44 °C	Comparison to TC Furnace, Fluke 8508A 8.5 Digit Multimeter, Type S Thermocouple
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	Comparison to Fluke 8508A 8.5 Digit Multimeter, Secondary Standard PRT
Temperature – Measure [1]	(600 to 1 200) °C	0.055 % of reading + 0.17 °C	Comparison to 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	Comparison to 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	Comparison to 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	Comparison to 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. Unless otherwise specified in the far-right column, the calibration procedure or method was written internally.
4. This scope is formatted as part of a single document including Certificate of Accreditation No. L2165.

Jason Stine, Vice President