



# 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](http://www.anab.org).

A handwritten signature in black ink, appearing to read 'R. Douglas Leonard Jr.', is positioned above a horizontal line.

R. Douglas Leonard Jr., VP, PILR SBU

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 <sup>1</sup>	(0 to 200) $\mu$ A 200 $\mu$ A to 2 mA (2 to 20) mA (20 to 200) mA 200 mA to 2A (2 to 20) A	3 $\mu$ A/A + 7.8 nA 8.5 $\mu$ A/A + 20 nA 13 $\mu$ A/A + 0.11 $\mu$ A 41 $\mu$ A/A + 1.7 $\mu$ A 0.16 mA/A + 30 $\mu$ A 0.36 mA/A + 1.2 mA	Fluke 5520A Multifunction Calibrator, Fluke 8508A 8.5 Digit Multimeter
DC Current – Measure <sup>1</sup>	(0 to 200) $\mu$ A (0.2 to 2) mA (2 to 20) mA (20 to 200) mA (0.2 to 2) A (2 to 20) A	3 $\mu$ A/A + 7.8 nA 12 $\mu$ A/A + 8.8 nA 14 $\mu$ A/A + 58 nA 41 $\mu$ A/A + 1.4 $\mu$ A 0.17 mA/A + 22 $\mu$ A 0.37 mA/A + 1 mA	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 <sup>1</sup>	2 $\mu$ A to 200 $\mu$ A 10 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.15 mA/A + 80 nA 0.1 mA/A + 0.12 $\mu$ A 0.1 mA/A + 0.16 $\mu$ A	Fluke 5520A Multifunction Calibrator, Fluke 8508A 8.5 Digit Multimeter	
	200 $\mu$ A to 2 mA 10 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.25 mA/A + 0.23 $\mu$ A 0.25 mA/A + 0.23 $\mu$ A 0.22 mA/A + 0.31 $\mu$ A		
	2 mA to 20 mA 10 Hz to 5 kHz (5 to 10) kHz	0.25 mA/A + 2.5 $\mu$ A 0.23 mA/A + 3.1 $\mu$ A		
	20 mA to 200 mA 10 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.25 mA/A + 25 $\mu$ A 0.2 mA/A + 44 $\mu$ A 0.15 mA/A + 80 $\mu$ A		
	200 mA to 2 A 10 Hz to 1 kHz (1 to 2) kHz	0.6 mA/A + 0.21 mA 0.7 mA/A + 0.8 mA		
	200 mA to 2 A (2 to 5) kHz (5 to 10) kHz	0.8 mA/A + 0.8 mA 2.4 mA/A + 3.9 mA		
	2 A to 20 A 45 Hz to 2 kHz (2 to 5) kHz	0.81 mA/A + 2.5 mA 2.5 mA/A + 2.6 mA		
AC Current – Source <sup>1</sup>	(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 $\mu$ A 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 <sup>1</sup>	10 Hz to 10 kHz (2 to 200) $\mu$ A 200 $\mu$ A to 2 mA (2 to 20) mA (20 to 200) mA	0.62 mA/A + 30 nA 0.31 mA/A + 0.22 $\mu$ A 0.33 mA/A + 1.5 $\mu$ A 0.3 mA/A + 20 $\mu$ A	Fluke 8508A 8.5 Digit Multimeter
		10 Hz to 2 kHz 200 mA to 2 A (2 to 20) A	0.63 mA/A + 0.2 mA 0.84 mA/A + 2.1 mA	
		(2 to 10) kHz 200 mA to 2 A	0.87 mA/A + 0.21 mA	

**Electrical – DC/Low Frequency**

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Resistance – Measure <sup>1</sup>	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
Resistance – Source <sup>1</sup> (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 <sup>1</sup> (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 <sup>1</sup> (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 <sup>1</sup>	(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 <sup>1</sup>	(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

**Electrical – DC/Low Frequency**

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
AC Voltage – Source <sup>1</sup>	(2 to 200) mV		Fluke 5520A Multifunction Calibrator, Fluke 8508A 8.5 Digit Multimeter
	(10 to 40) Hz	0.12 mV/V + 9.5 μV	
	(40 to 100) Hz	0.1 mV/V + 6.9 μV	
	100 Hz to 2 kHz	0.1 mV/V + 4.4 μV	
	(2 to 10) kHz	0.1 mV/V + 7.3 μV	
	(10 to 30) kHz	0.3 mV/V + 14 μV	
	(30 to 100) kHz	0.69 mV/V + 31 μV	
	20 mV to 2 V		
	(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		
AC Voltage – Source <sup>1</sup>	(0.2 to 20) V		Fluke 5520A Multifunction Calibrator, Fluke 8508A 8.5 Digit Multimeter
	(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		
(330 to 1 020) V		Fluke 5520A Multifunction Calibrator	
45 Hz to 10 kHz	0.21 mV/V + 35 mV		

**Electrical – DC/Low Frequency**

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
AC Voltage – Measure <sup>1</sup>	(2 to 200) mV		Fluke 8508A 8.5 Digit Multimeter
	(10 to 40) Hz	160 $\mu$ V/V + 5.6 $\mu$ V	
	(40 to 100) Hz	120 $\mu$ V/V + 5.6 $\mu$ V	
	100 Hz to 2 kHz	120 $\mu$ V/V + 4.4 $\mu$ V	
	(2 to 10) kHz	150 $\mu$ V/V + 5.6 $\mu$ V	
	(10 to 30) kHz	350 $\mu$ V/V + 8.9 $\mu$ V	
	(30 to 100) kHz	780 $\mu$ V/V + 21 $\mu$ V	
	20 mV to 2 V		
	(10 to 40) Hz	0.13 mV/V + 21 $\mu$ V	
	(40 to 100) Hz	99 $\mu$ V/V + 21 $\mu$ V	
	100 Hz to 2 kHz	79 $\mu$ V/V + 21 $\mu$ V	
	(2 to 10) kHz	0.12 mV/V + 21 $\mu$ V	
	(10 to 30) kHz	0.23 mV/V + 41 $\mu$ V	
	(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		
AC Voltage – Measure <sup>1</sup>	(0.2 to 20) V		Fluke 8508A 8.5 Digit Multimeter
	(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 $\mu$ V/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	3.01 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 $\mu$ V/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 – DC/Low Frequency**

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



### Length – Dimensional Metrology

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Cylindrical Rings <sup>2</sup>	(0.04 to 13) in	$(12 + 2L) \mu\text{in}$	Master Gage Blocks, Labmaster Universal
Cylindrical Plugs <sup>2</sup>	Up to 10 in	$(42 + 4.9L) \mu\text{in}$	Gage Blocks, Supermicrometer
Gage Blocks <sup>2</sup>	(0.05 to 1) in (1 to 4) in (4 to 20) in	$(3.2 + 1.1L) \mu\text{in}$ $(2.3 + 2L) \mu\text{in}$ $(1.4 + 2.4L) \mu\text{in}$	Master Gage Blocks, Gage Block Comparator
Length Standards <sup>2</sup> (Micrometer)	(1 to 48) in	$(66 + 3.4L) \mu\text{in}$	Standard Measuring Machine or LMU, Gage Blocks
Surface Plates <sup>1,2</sup> Overall Flatness	Up to 108 in $DL$ (108 to 188) in $DL$	$(13 + 1.2DL) \mu\text{in}$ $(80 + 0.42DL) \mu\text{in}$	In accordance with ASME B89.3.7 using Electronic Level System
Local Area Flatness	$\pm 0.001$ in	$29 \mu\text{in}$	Repeat-O-Meter
Thread Wires 60 ° 29 °	(4 to 80) TPI (1 to 20) TPI	$13 \mu\text{in}$	Master Thread Wires, LMU
Thread Plugs <sup>2</sup> Pitch Diameter	(0.04 to 10) in	$(100 + 4.5L) \mu\text{in}$	Supermicrometer, Gage Blocks, Thread Wires
Major Diameter	(0.04 to 10) in	$(55 + 6.7L) \mu\text{in}$	
Taper Thread Plugs <sup>2</sup> (NPT, L1, L3, ANPT, NPTF) Pitch Diameter	Up to 10 in	$(250 + 7.1L) \mu\text{in}$	Supermicrometer, Gage Blocks, Thread Measuring Wires
Thread Rings <sup>2</sup> Pitch Diameter	(0.04 to 10) in	$(330 + 70L) \mu\text{in}$	Thread Plug Set
Minor Diameter	(0.08 to 8) in	$(200 + 31L) \mu\text{in}$	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	Master Plug, Mu-Checker, Height Gage
API Standoff Spec 5B Spec 7	As Specified	0.002 in 490 $\mu\text{in}$	Master Gages, Gage Blocks, Depth Micrometer
Calipers <sup>1,2</sup> Outside Jaws (0.001 in Resolution)	Up to 48 in	0.001 in	Gage Blocks Cylindrical Rings
(0.000 5 in Resolution)	Up to 24 in (24 to 48) in	$(557 + 0.7L) \mu\text{in}$ 0.001 in	



**Length – Dimensional Metrology**

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Calipers <sup>1,2</sup> Inside Jaws (0.001 in Resolution) (0.000 5 in Resolution)  Depth Bar / Front Step (0.001 in Resolution) (0.000 5 in Resolution)	Up to 4 in Up to 4 in  Up to 4 in Up to 4 in	0.001 in 572 μin  0.001 in 531 μin	Gage Blocks, Cylindrical Rings
Height Gages <sup>1,2</sup> (0.001 in Resolution) (0.000 5 in Resolution) (0.000 1 in Resolution)	Up to 40 in Up to 40 in Up to 40 in	(610 + 0.64L) μin (430 + 0.88L) μin (140 + 2.1L) μin	Gage Blocks
Indicators <sup>1,2</sup> (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) <sup>1,2</sup> (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 + 15L) μin (120 + 132L) μin (76 + 16L) μin	Cylindrical Rings
Micrometers-Depth <sup>1,2</sup> (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 + 4.5L) μin (140 + 13L) μin (52 + 19L) μin	Gage Blocks, Depth Gage Master
Micrometers-Inside <sup>1,2</sup>	Up to 48 in	(430 + 1.4L) μin	Gage Blocks, Supermicrometer or Standard Measuring Machine
Micrometers-Outside <sup>1,2</sup> (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 + 1.1L) μin (67 + 4.7L) μin (62 + 3.9L) 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
Rockwell Hardness Testers <sup>1</sup>	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 <sup>1</sup>	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

### Mass and Mass Related

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Hydraulic Pressure <sup>1</sup>	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 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	
	(0 to 50) psig (50 to 100) psig	0.007 9 psi 0.015 % of reading + 0.000 2 psi	
Pneumatic Pressure	(0 to 150) psig (150 to 300) psig	0.023 psi 0.015 % of reading + 0.000 5 psi	Mensor CPC6000 Pressure Controller
Pneumatic Pressure	(0 to 500) psig (500 to 1 000) psig	0.097 psi 0.017 % of reading + 0.013 psi	Mensor CPC6000 Pressure Controller
Torque Wrench <sup>1,2</sup>	(10 to 100) ozf·in (10 to 100) lbf·in (10 to 100) lbf·ft (25 to 250) lbf·ft (100 to 1 000) lbf·ft	(0.09 + 0.019X) ozf·in (0.3 + 0.005X) lbf·in (0.31 + 0.004X) lbf·ft (0.07 + 0.008X) lbf·ft (0.15 + 0.006X) lbf·ft	Torque Calibration System

### Thermodynamic

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Temperature Source <sup>1</sup>	(-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
Temperature Source <sup>1</sup>	(300 to 600) °C	0.21 °C	Drywell Calibrator, Fluke 8508A 8.5 Digit Multimeter, Secondary Standard PRT

### Thermodynamic

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Temperature Source <sup>1</sup>	(600 to 1 200) °C	0.042 % of reading + 0.44 °C	TC Furnace, Fluke 8508A 8.5 Digit Multimeter, Type S Thermocouple
Temperature Measure <sup>1</sup>	(-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
Temperature Measure <sup>1</sup>	(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 <sup>1</sup>	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 <sup>1</sup>	20 mV to 30 V 1 mHz to 300 MHz	0.51 nHz/Hz + 4.4 μHz	SR 625 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,  $X$  = Torque in defined unit.
3. This scope is formatted as part of a single document including Certificate of Accreditation No. L2165.



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