CERTIFICATE OF ACCREDITATION

This is to attest that

STANDARD CALIBRATIONS INC

501 RESOURCE ROW
CHESAPEAKE, VIRGINIA 23320 U.S.A.

Calibration Laboratory CL-120

has met the requirements of AC204, *IAS Accreditation Criteria for Calibration Laboratories*, and has demonstrated compliance with ISO/IEC Standard 17025:2017, *General requirements for the competence of testing and calibration laboratories.* This organization is accredited to provide the services specified in the scope of accreditation.

Effective Date March 26, 2024

Expiration Date September 1, 2024

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STANDARD CALIBRATIONS INC

Contact Name Bennie Tiner **Contact Phone** +1-757-549-6534

Accredited to ISO/IEC 17025:2017 *Effective Date March 26, 2024*

CALIBRATION AND MEASUREMENT CAPABILITY (CMC)*

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2,6] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Dimensional			
Calipers[5]	Up to 60 in	(290 + 10 L) µin	Direct Comparison Gage Blocks, Master Rings
Cylindrical Gages[5] (Pins, Plugs, Discs)	Up to 7 in Ø	(3.8 + 2.7 D) µin	Direct Comparison P&W LMU, Gage Blocks
Linear Indicators[5] (Digital, Dial, Test, etc.)	Up to 4 in	25 µin	Direct Comparison P&W Type C
Height Gages[5]	Up to 84 in	(18 + 2.8 L) µin	Direct Comparison Gage Blocks, Surface Plate
Flatness[5] Parallelism[5]	Up to 1 in Ø Up to 0.001 in	6.5 µin 6.5 µin	Direct Comparison Optical Flats
Gage Blocks[5]	Up to 4 in (4 in 13) in	(2.3 + 1.5 L) µin (1.5 + 1.5 L) µin	Direct Comparison P&W LMU, Gage Blocks
Micrometers[5]	Up to 1 in (1 to 60) in	(3.7 + 1.5 L) µin (3.5 + 3 L) µin	Direct Comparison Gage Blocks
Micrometer End Standards[5]	Up to 59 in	(25 + 1.6 L) µin	Direct Comparison Starrett 717, Gage Blocks
Plain Rings[5]	Up to 8 in Ø	(12 + 2.7 L) µin	Direct Comparison P&W LMU, Gage Blocks,
Thread Plugs – Major Diameter Pitch Diameter	(2 TPI to 120 TPI) Up to 20 in Up to 20 in	 (26 + 1.6 L) µin (83 + 3.5 L) µin	Direct Comparison P&W Type C Gage Blocks, Thread Wires
Thread Rings – Minor Diameter Pitch Diameter	 Up to 4 in Ø Up to 4 in Ø	 (36 + 4.3 L) µin (96 + 3.8 L) µin	Direct Comparison P&W LMU, Master Ring Gage, Thread Setting Plug
Thread Wires[5]	2 TPI to 120 TPI	(6.9 + 1.5 L) µin	Direct Comparison P&W LMU, Gage Blocks

** If information in this CMC is presented in non-SI units, the conversion factors stated in NIST Special Publication 811 "Guide for the Use of the International System of Units (SI)" apply.*

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2,6] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
	Mechanical		
Torque Measuring Devices	5 ozf·in to 2000 lbf·ft	0.081 %	Direct Comparison Torque Arm, Class F Weights
Torque Wrenches	5 ozf·in to 2000 lbf·ft	0.34 %	Direct Comparison CDI 4:1 Transducer CDI Load Cell (x4) w/ Display
Pressure Measuring Equipment	0 in H_20 to 100 in H_20 2 psi to 160 psi 58 psi to 810 psi 145 psi to 3988 psi 290 psi to 15970 psi 3000 psi to 30000 psi	0.0058 % + 0.000058 in H_2O 0.00064 % + 0.000078 psi 0.0019 % + 0.000094 psi 0.0024 % + 0.00034 psi 0.0029 % + 0.0043 psi 0.084 % + 0.58 psi	Direct Comparison Fluke 7252i Fluke PG System Omega PX01S1-30KGI
Vacuum Measuring Equipment	0 in Hg to 29.8 in Hg	0.01 % FS	Direct Comparison Fluke 6270A
Compression – Dynamometers/Load Cells	0.5 lbf to 5 lbf 5 lbf to 300 lbf 100 lbf to 2000 lbf 500 lbf to 25000 lbf 2906 lbf to 60000 lbf	0.23 % FS + 0.00058 lbf 0.0068 % + 0.00058 lbf 0.0071 % + 0.00058 lbf 0.0061 % + 0.00058 lbf 0.012 % FS + 0.00058 lbf	Direct Comparison Force Transducers Proving Rings
Tension – Dynamometers/Load Cells	0.5 lbf to 5 lbf 5 lbf to 300 lbf 100 lbf to 2000 lbf 500 lbf to 25000 lbf	0.23 % FS + 0.00058 lbf 0.0078 % + 0.00058 lbf 0.0077 % + 0.00058 lbf 0.0075 % + 0.00058 lbf	Direct Comparison Force Transducers
Force Measuring Equipment	0.125 lbf to 625 lbf	0.011 % + 0.0029 lbf	Direct Method Class 6 Weights
Fuel Flow Meters (Turbine, Positive Displacement, Rotometers, Vortex, Ultrasonic Meters)	2 gal/min to 30 gal/min 30 gal/min to 150 gal/min	0.14 % 0.12 %	Direct Comparison E+H Promass
Water Flow Meters (Turbine, Positive Displacement, Mag, Rotometers, Vortex, Ultrasonic Meters)	2 gal/min to 8.8 gal/min 8.8 gal/min to 29 gal/min 29 gal/min to 79 gal/min 79 gal/min to 199 gal/min 199 gal/min to 309 gal/min	0.11 % 0.14 % 0.18 % 0.12 % 0.14 %	Direct Comparison E+H Promass

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2,6] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Water Flow Meters (continued)	309 gal/min to 794 gal/min 794 gal/min to 1100 gal/min	0.14 % 0.24 %	Direct Comparison E+H Promass
Thermal			
Temperature – Measure[4]	-196 ºC to -40 ºC -40 ºC to 220 ºC 220 ºC to 420 ºC 420 ºC to 660 ºC	0.0045 ºC 0.0045 ºC 0.0068 ºC 0.011 ºC	Direct Comparison Fluke 5699 SPRT, Fluke 8508A
Temperature Measuring Equipment	-196 ºC to -40 ºC -40 ºC to 220 ºC 220 ºC to 420 ºC 420 ºC to 660 ºC	0.015 ºC 0.015 ºC 0.018 ºC 0.021 ºC	Direct Comparison Fluke 5699 SPRT, Fluke 8508A
Infrared Thermometry – Measuring Equipment	50 ºC to 100 ºC 100 ºC to 300 ºC 300 ºC to 500 ºC	0.65 % + 0.59 ºC 0.63 % + 0.59 ºC 0.79 % + 0.67 ºC	Direct Comparison Fluke 9132 Λ = (8 to 14) µm Ɛ = 0.95
Humidity – Generate[3]	12 %RH to 95 %RH (45 °F to 122 °F)	0.62 %	Direct Comparison Thunder Scientific 1200
Electrical – DC/LF			
DC Voltage – Generate[3]	0 mV to 329.9999 mV 0.330 V to 3.299999 V 3.30 V to 32.99999 V 33.0 V to 329.9999 V 330 V to 1000 V	16 µV/V + 0.78 µV 8.9 µV/V + 1.9 µV 9.5 µV/V + 27 µV 15 µV/V + 0.23 mV 14 µV/V + 1.2 mV	Direct Comparison Fluke 552XA
DC Voltage – Measure[4,7]	0 mV to 199.99 mV 0.19999 V to 1.9999 V 1.9999 V to 19.999 V 19.999 V to 199.99 V 199.99 V to 1050 V	4.5 µV/V + 0.58 nV 3.0 µV/V + 5.8 nV 3.2 µV/V + 58 nV 4.5 µV/V + 0.58 µV 4.6 µV/V + 5.8 µV	Direct Comparison Fluke 8508A
DC Current – Generate[3]	0 µA to 329.999 µA 0.33 mA to 3.29999 mA 3.3 mA to 32.9999 mA 33 mA to 329.999 mA 0.33 A to 1.09999 A 1.1 A to 2.99999 A 3.0 A to 10.9999 A 11 A to 20.5 A 20 A to 149.999 A 150 A to 1025 A	0.012 % + 19 nA 78 µA/A + 0.04 µA 78 µA/A + 0.23 µA 78 µA/A + 2.3 µA 0.023 % + 33 µA 0.044 % + 33 µA 0.041 % + 0.4 mA 0.084 % + 0.59 mA 0.29 % + 17 mA 0.30 % + 58 mA	Direct Comparison Fluke 552XA Fluke 55XXA, Fluke 5500A/COIL
DC Current – Measure[4,7]	0 µA to 199.99 µA 0.19999 mA to 1.9999 mA 1.9999 mA to 19.999 mA 19.999 mA to 199.99 mA 0.19999 A to 1.9999 A	13 µA/A + 5.8 pA 12 µA/A + 58 pA 14 µA/A + 0.58 nA 36 µA/A + 5.8 nA 0.017 % + 58 nA	Direct Comparison Fluke 8508A

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2,6] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
DC Current – Measure[4,7] (continued)	1.9999 A to 19.999 A	0.042 % + 0.58 µA	Direct Comparison Fluke 8508A
DC Shunt Current – Measure[4,7]	19.999 A to 300 A	0.019 % + 58 nA	Indirect Comparison Fluke 8508A, Shunt
DC Resistance – Generate[3]	0 Ω to 10.9999 Ω 11 Ω to 32.9999 Ω 33 Ω to 109.9999 Ω 110 Ω to 329.9999 Ω 0.33 kΩ to 1.099999 kΩ 1.1 kΩ to 3.299999 kΩ 3.3 kΩ to 10.99999 kΩ 11 kΩ to 32.99999 kΩ 33 kΩ to 109.9999 kΩ 110 kΩ to 329.9999 kΩ 0.33 MΩ to 1.099999 MΩ 1.1 MΩ to 3.299999 MΩ 3.3 MΩ to 10.99999 MΩ 11 MΩ to 32.99999 MΩ 33 MΩ to 109.9999 MΩ 110 MΩ to 329.9999 MΩ 0.33 GΩ to 1.1 GΩ	32 µΩ/Ω + 0.78 mΩ 24 µΩ/Ω + 1.2 mΩ 25 µΩ/Ω + 1.1 mΩ 22 µΩ/Ω + 1.6 mΩ 22 µΩ/Ω + 1.6 mΩ 22 µΩ/Ω + 16 mΩ 22 µΩ/Ω + 16 mΩ 23 µΩ/Ω + 0.16 Ω 22 µΩ/Ω + 0.16 Ω 37 µΩ/Ω + 1.6 Ω 25 µΩ/Ω + 1.9 Ω 47 µΩ/Ω + 23 Ω 0.010 % + 39 Ω 0.021 % + 1.9 kΩ 0.045 % + 2.3 kΩ 0.41 % + 0.078 MΩ 1.2 % + 0.39 MΩ	Direct Comparison Fluke 552XA
DC Resistance – Measure[4,7]	Up to 1.9999 Ω 1.9999 Ω to 19.999 Ω 19.999 Ω to 199.99 Ω 0.19999 kΩ to 1.9999 kΩ 1.9999 kΩ to 19.999 kΩ 19.999 kΩ to 199.99 kΩ 0.19999 MΩ to 1.9999 MΩ 1.9999 MΩ to 19.999 MΩ 19.999 MΩ to 199.99 MΩ 0.19999 GΩ to 1.9999 GΩ 1.9999 GΩ to 19.999 GΩ	16 µΩ/Ω + 5.8 nΩ 9.0 µΩ/Ω + 58 nΩ 7.5 µΩ/Ω +0.58 µΩ 7.5 µΩ/Ω + 5.8 µΩ 7.5 µΩ/Ω + 58 µΩ 7.5 µΩ/Ω +0.58 mΩ 8.7 µΩ/Ω + 5.8 mΩ 20 µΩ/Ω + 58 mΩ 78 µΩ/Ω + 0.58 Ω 0.076 % + 5.8 Ω 0.085 % + 58 Ω	Direct Comparison Fluke 8508A
Thermocouple Simulation –Generate/ Measure Type B Type E	 600 ºC to 800 ºC 800 ºC to 1000 ºC 1000 ºC to 1550 ºC 1550 ºC to 1820 ºC -250 ºC to -100 ºC -100 ºC to -25 ºC -25 ºC to 350 ºC 350 ºC to 650 ºC 650 ºC to 1000 ºC	 0.34 ºC 0.26 ºC 0.23 ºC 0.26 ºC 0.39 ºC 0.13 ºC 0.11 ºC 0.12 ºC 0.16 ºC	Direct Comparison Fluke 552XA

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2,6] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Thermocouple Simulation –Generate/ Measure (continued)			Direct Comparison Fluke 552XA
Type J	-210 ºC to -100 ºC -100 ºC to -30 ºC -30 ºC to 150 ºC 150 ºC to 760 ºC 760 ºC to 1200 ºC	0.21 ºC 0.13 ºC 0.11 ºC 0.13 ºC 0.18 ºC	
Type K	-200 ºC to -100 ºC -100 ºC to -25 ºC -25 ºC to 120 ºC 120 ºC to 1000 ºC 1000 ºC to 1372 ºC 800 ºC to 900 ºC	0.26 ºC 0.14 ºC 0.12 ºC 0.20 ºC 0.31 ºC 0.13 ºC	
Type N	-200 ºC to -100 ºC -100 ºC to -25 ºC -25 ºC to 120 ºC 120 ºC to 410 ºC 410 ºC to 1300 ºC	0.31 ºC 0.17 ºC 0.16 ºc 0.14 ºC 0.21 ºC	
Type R	0 ºC to 250 ºC 250 ºC to 400 ºC 400 ºC to 1000 ºC 1000 ºC to 1767 ºC	0.45 ºC 0.28 ºC 0.27 ºC 0.33 ºC	
Type S	0 ºC to 250 ºC 250 ºC to 1000 ºC 1000 ºC to 1400 ºC 1400 ºC to 1767 ºC	0.38 ºC 0.28 ºC 0.29 ºC 0.36 ºC	
Type T	-250 ºC to -150 ºC -150 ºC to 0 ºC 0 ºC to 120 ºC 120 ºC to 400 ºC	0.49 ºC 0.19 ºC 0.13 ºC 0.11 ºC	
Type U	-200 ºC to 0 ºC 0 ºC to 600 ºC	0.43 ºC 0.21 ºC	
AC Voltage – Generate[3]	1.1 mV to 32.999 mV (10 Hz to 45 Hz) (0.045 kHz to 10 kHz) (10 kHz to 20 kHz) (20 kHz to 50 kHz) (50 kHz to 100 kHz) (100 kHz to 500 kHz)	 0.062 % + 4.7 µV 0.013 % + 4.7 µV 0.016 % + 4.7 µV 0.079 % + 4.7 µV 0.27 % + 9.3 µV 0.62 % + 39 µV	Direct Comparison Fluke 552XA

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2,6] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
AC Voltage – Generate[3] (continued)	33 mV to 329.999 mV (10 Hz to 45 Hz) (0.045 kHz to 10 kHz) (10 kHz to 20 kHz) (20 kHz to 50 kHz) (50 kHz to 100 kHz) (100 kHz to 500 kHz) 0.33 V to 3.29999 V (10 Hz to 45 Hz) (0.045 kHz to 10 kHz) (10 kHz to 20 kHz) (20 kHz to 50 kHz) (50 kHz to 100 kHz) (100 kHz to 500 kHz) 3.3 V to 32.9999 V (10 Hz to 45 Hz) (0.045 kHz to 10 kHz) (10 kHz to 20 kHz) (20 kHz to 50 kHz) (50 kHz to 100 kHz) 33 V to 329.999 V (0.045 kHz to 1 kHz) (1 kHz to 10 kHz) (10 kHz to 20 kHz) (20 kHz to 50 kHz) (50 kHz to 100 kHz) 330 V to 1020 V (0.045 kHz to 1 kHz) (1 kHz to 5 kHz) (5 kHz to 10 kHz)	 0.024 % + 6.2 µV 0.014 % + 6.2 µV 0.012 % + 6.2 µV 0.028 % + 6.2 µV 0.062 % + 25 µV 0.16 % + 54 µV 0.023 % + 39 µV 0.012 % + 47 µV 0.015 % + 47 µV 0.025 % + 39 µV 0.054 % + 97 µV 0.19 % + 0.48 mV 0.023 % + 0.5 mV 0.014 % + 0.47 mV 0.019 % + 0.47 mV 0.027 % + 0.47 mV 0.070 % + 1.2 mV 0.015 % + 1.6 mV 0.016 % + 4.7 mV 0.019 % + 4.7 mV 0.023 % + 4.7 mV 0.16 % + 39 mV 0.023 % + 7.8 mV 0.019 % + 7.8 mV 0.023 % + 7.8 mV	Direct Comparison Fluke 552XA
AC Voltage – Measure[4]	0 mV to 70 mV (10 Hz to 20 Hz) (20 Hz to 40 Hz) (0.04 kHz to 20 kHz) (20 kHz to 50 kHz) (50 kHz to 100 kHz) (100 kHz to 300 kHz) (300 kHz to 500 kHz) (0.5 MHz to 1 MHz)	 0.044 % + 1.2 µV 0.022 % + 1.2 µV 0.024 % + 1.2 µV 0.021 % + 1.6 µV 0.031 % + 1.9 µV 0.048 % + 3.1 µV 0.052 % + 6.2 µV 0.087 % + 6.2 µV	Direct Comparison Fluke 5790A

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2,6] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
AC Voltage – Measure[4] (continued)	70 mV to 220 mV		Direct Comparison Fluke 5790
	(10 Hz to 20 Hz)	0.016 % + 1.2 µV	
	(20 Hz to 40 Hz)	0.0067 % + 1.2 µV	
	(0.04 kHz to 20 kHz)	0.0033 % + 1.2 µV	
	(20 kHz to 50 kHz)	0.0055 % + 1.6 µV	
	(50 kHz to 100 kHz)	0.013 % + 1.9 µV	
	(100 kHz to 300 kHz)	0.020 % + 3.1 µV	
	(300 kHz to 500 kHz)	0.030 % + 6.2 µV	
	(0.5 MHz to 1 MHz)	0.078 % + 6.2 µV	
	220 mV to 700 mV		
	(10 Hz to 20 Hz)	0.016 % + 1.2 µV	
	(20 Hz to 40 Hz)	0.0059 % + 1.2 µV	
	(0.04 kHz to 20 kHz)	0.0026 % + 1.2 µV	
	(20 kHz to 50 kHz)	0.0040 % + 1.6 µV	
	(50 kHz to 100 kHz)	0.0061 % + 1.9 µV	
	(100 kHz to 300 kHz)	0.014 % + 3.1 µV	
	220 mV to 700 mV		
	(300 kHz to 500 kHz)	0.023 % + 6.2 µV	
	(0.5 MHz to 1 MHz)	0.075 % + 6.2 µV	
	0.7 V to 2.2 V		
	(10 Hz to 20 Hz)	0.016 % + 58 nV	
	(20 Hz to 40 Hz)	0.0051 % + 58 nV	
	(0.04 kHz to 20 kHz)	0.0019 % + 58 nV	
	(20 kHz to 50 kHz)	0.0036 % + 58 nV	
	(50 kHz to 100 kHz)	0.0055 % + 58 nV	
	(100 kHz to 300 kHz)	0.012 % + 58 nV	
	(300 kHz to 500 kHz)	0.020 % + 58 nV	
	(0.5 MHz to 1 MHz)	0.070 % + 58 nV	
	2.2 V to 7 V		
	(10 Hz to 20 Hz)	0.016 % + 0.58 µV	
	(20 Hz to 40 Hz)	0.0053 % +0.58 µV	
	(0.04 kHz to 20 kHz)	0.0022 % +0.58 µV	
	(20 kHz to 50 kHz)	0.0039 % +0.58 µV	
	2.2 V to 7 V		
	(50 kHz to 100 kHz)	0.0064 % +0.58 µV	
	(100 kHz to 300 kHz)	0.015 % + 0.58 µV	
	(300 kHz to 500 kHz)	0.032 % + 0.58 µV	
	(0.5 MHz to 1 MHz)	0.093 % + 0.58 µV	
	7 V to 22 V		
	(10 Hz to 20 Hz)	0.016 % + 0.58 µV	
	(20 Hz to 40 Hz)	0.0052 % +0.58 µV	
	(0.04 kHz to 20 kHz)	0.0023 % +0.58 µV	

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2,6] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
AC Voltage – Measure[4] (continued)	(20 kHz to 50 kHz) (50 kHz to 100 kHz) (100 kHz to 300 kHz) (300 kHz to 500 kHz) (0.5 MHz to 1 MHz) 22 V to 70 V (20 Hz to 40 Hz) (0.04 kHz to 20 kHz) (20 kHz to 50 kHz) (50 kHz to 100 kHz) (100 kHz to 300 kHz) (300 kHz to 500 kHz) (0.5 MHz to 1 MHz) 70 V to 220 V (0.04 kHz to 20 kHz) (20 kHz to 50 kHz) (50 kHz to 100 kHz) 220 V to 700 V (0.04 kHz to 20 kHz) (20 kHz to 50 kHz) (50 kHz to 100 kHz) 700 V to 1000 V (0.04 kHz to 20 kHz) (20 kHz to 50 kHz) (50 kHz to 100 kHz)	0.0038 % +0.58 µV 0.0063 % +0.58 µV 0.015 % + 0.58 µV 0.032 % + 0.58 µV 0.093 % + 0.58 µV 0.0054 % + 5.8 µV 0.0027 % + 5.8 µV 0.0046 % + 5.8 µV 0.0074 % + 5.8 µV 0.016 % + 5.8 µV 0.032 % + 5.8 µV 0.093 % + 5.8 µV 0.0027 % + 5.8 µV 0.0054 % + 5.8 µV 0.0077 % + 5.8 µV 0.0034 % + 58 µV 0.010 % + 58 µV 0.039 % + 58 µV 0.0030 % + 58 µV 0.010 % + 58 µV 0.039 % + 58 µV	Direct Comparison Fluke 5790
Capacitance – Generate[3,8]	0.19 nF to 0.3999 nF 0.4 nF to 1.0999 nF 1.1 nF to 3.2999 nF 3.3 nF to 10.999 nF 11 nF to 32.999 nF 33 nF to 109.99 nF 110 nF to 329.99 nF 0.33 µF to 1.0999 µF 1.1 µF to 3.2999 µF 3.3 µF to 10.999 µF 11 µF to 32.999 µF 33 µF to 109.99 µF 110 µF to 329.99 µF 0.33 mF to 1.0999 mF	0.40 % +0.0097 nF 0.40 % +0.0078 nF 0.39 % +0.0078 nF 0.20 % +0.0078 nF 0.19 % + 0.078 nF 0.19 % + 0.078 nF 0.19 % + 0.23 nF 0.19 % + 0.78 nF 0.19 % + 2.3 nF 0.19 % + 7.8 nF 0.31 % + 23 nF 0.35 % + 78 nF 0.35 % + 0.23 µF 0.35 % + 0.78 µF	Direct Comparison Fluke 552XA

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2,6] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
AC Current – Generate[3]	29 µA to 329.99 µA		Direct Comparison Fluke 552XA
	(10 Hz to 20 Hz)	0.16 % + 0.18 µA	
	(20 Hz to 45 Hz)	0.12 % + 0.18 µA	
	(0.045 kHz to 1 kHz)	0.097 % + 0.18 µA	
	(1 kHz to 5 kHz)	0.23 % + 0.20 µA	
	(5 kHz to 10 kHz)	0.62 % + 0.23 µA	
	(10 kHz to 30 kHz)	1.2 % + 0.35 µA	
	0.33 mA to 3.2999 mA		
	(10 Hz to 20 Hz)	0.16 % + 0.20 µA	
	(20 Hz to 45 Hz)	0.097 % + 0.20 µA	
	(0.045 kHz to 1 kHz)	0.078 % + 0.20 µA	
	(1 kHz to 5 kHz)	0.16 % + 0.23 µA	
	(5 kHz to 10 kHz)	0.39 % + 0.28 µA	
	(10 kHz to 30 kHz)	0.78 % + 0.49 µA	
	3.3 mA to 32.999 mA		
	(10 Hz to 20 Hz)	0.14 % + 1.6 µA	
	(20 Hz to 45 Hz)	0.070 % + 1.6 µA	
	(0.045 kHz to 1 kHz)	0.031 % + 1.6 µA	
	(1 kHz to 5 kHz)	0.062 % + 1.6 µA	
	3.3 mA to 32.999 mA		
	(5 kHz to 10 kHz)	0.16 % + 2.3 µA	
	(10 kHz to 30 kHz)	0.31 % + 3.1 µA	
	33 mA to 329.99 mA		
	(10 Hz to 20 Hz)	0.14 % + 16 µA	
	(20 Hz to 45 Hz)	0.072 % + 16 µA	
	(0.045 kHz to 1 kHz)	0.031 % + 16 µA	
	(1 kHz to 5 kHz)	0.078 % + 39 µA	
	(5 kHz to 10 kHz)	0.16 % + 0.078 mA	
	(10 kHz to 30 kHz)	0.32 % + 0.19 mA	
	0.33 A to 1.09999 A		
	(10 Hz to 45 Hz)	0.14 % + 78 µA	
	(0.045 kHz to 1 kHz)	0.039 % +78 µA	
	0.33 A to 1.09999 A		
	(1 kHz to 5 kHz)	0.47 % + 0.78 mA	
	(5 kHz to 10 kHz)	1.9 % + 3.9 mA	
	1.1 A to 2.99999 A		
	(10 Hz to 45 Hz)	0.14 % + 78 µA	
	(0.045 kHz to 1 kHz)	0.047 % + 78 µA	
	(1 kHz to 5 kHz)	0.47 % + 0.78 mA	
	(5 kHz to 10 kHz)	1.9 % + 3.9 mA	

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2,6] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
AC Current – Generate[3] (continued)	3 A to 10.9999 A (45 Hz to 100 Hz) (0.1 kHz to 1 kHz) (1 kHz to 5 kHz) 11 A to 20.5 A (45 Hz to 100 Hz) (0.1 kHz to 1 kHz) (1 kHz to 5 kHz) 20 A to 149.999 A (45 Hz to 65 Hz) (65 Hz to 440 Hz) 150 A to 1025 A (45 Hz to 65 Hz) (65 Hz to 440 Hz)	 0.047 % + 1.6 mA 0.078 % + 1.6 mA 2.3 % + 1.6 mA 0.093 % + 3.9 mA 0.12 % + 3.9 mA 2.3 % + 3.9 mA 0.34 % + 30 mA 0.94 % + 6.7 mA 0.34 % + 0.11 A 1.2 % + 0.12 A	Direct Comparison Fluke 552XA Fluke 552XA, Fluke 5500A Coil
AC Current – Measure[4]	0 µA 199.99 µA (1 Hz to 10 Hz) (0.01 kHz to 10 kHz) (10 kHz to 30 kHz) 0.2 mA to 1.9999 mA (1 Hz to 10 Hz) (0.01 kHz to 10 kHz) (10 kHz to 30 kHz) 2 mA to 19.999 mA (1 Hz to 10 Hz) (0.01 kHz to 10 kHz) (10 kHz to 30 kHz) 20 mA to 199.99 mA (1 Hz to 10 Hz) (0.01 kHz to 10 kHz) (10 kHz to 30 kHz) 0.2 A to 1.9999 A (0.010 kHz to 2 kHz) (2 kHz to 10 kHz) 2 A to 19.999 A (0.010 kHz to 2 kHz) (2 kHz to 10 kHz)	 0.049 % + 58 pA 0.049 % + 58 pA 0.066 % + 58 pA 0.031 % + 0.58 nA 0.030 % + 0.58 nA 0.066 % + 0.58 nA 0.032 % + 5.8 nA 0.030 % + 5.8 nA 0.066 % + 5.8 nA 0.032 % + 58 nA 0.027 % + 58 nA 0.061 % + 58 nA 0.061 % + 0.58 µA 0.072 % + 0.58 µA 0.081 % + 5.8 µA 0.25 % + 5.8 µA	Direct Comparison Fluke 8508A

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2,6] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Oscilloscopes			Direct Comparison Fluke 5520A/SC600
DC Signal Level – 50 Ω 1 MΩ	 0 V to 6.6 V 0 V to 130 V	 0.19 % + 32 µV 0.039 % + 31 µV	
Leveled Sine Amplitude	0.005 $V_{(p-p)}$ to 5.5 $V_{(p-p)}$ 50 kHz Reference (0.05 MHz to 100 MHz) (100 MHz to 300 MHz) (300 MHz to 600 MHz)	 1.6 % + 0.24 mV 2.7 % + 0.24 mV 3.1 % + 0.24 mV 4.7 % + 0.24 mV	
Leveled Sine Flatness – Referenced to 50 kHz	0.005 $V_{(p-p)}$ to 5.5 $V_{(p-p)}$ (0.05 MHz to 100 MHz) (100 MHz to 300 MHz) (300 MHz to 600 MHz)	 1.2 % + 94 µV 1.6 % + 94 µV 3.1 % + 94 µV	
Edge Rise Time – (0.005 to 2.5) $V_{(p-p)}$ (0.001 to 2) MHz (1 to 10) MHz	 300 ps 350 ps	 7.4 ps 8.0 ps	
Square Wave Amplitude – 50 Ω, up to 10 kHz 1 MΩ, up to 10 kHz	 0.001 $V_{(p-p)}$ to 6.6 $V_{(p-p)}$ 0.001 $V_{(p-p)}$ to 130 $V_{(p-p)}$	 0.19 % + 31 µV 0.078 % + 31 µV	
Time Marker Output (50 Ω)	2 ns to 20 ms 0.050 s to 5 s	21 µs/s + 0.58 ps (20 + 780t) µs/s + 0.058 µs	
Time & Frequency			
Frequency – Generate[3]	10 MHz (Fixed Reference)	7.4 pHz/Hz	Direct Comparison Fluke 910R
	100 µHz to 20 MHz 20 MHz to 26.5 GHz 26.5 GHz to 40 GHz	11 pHz/Hz + 0.58 mHz 9.9 pHz/Hz + 0.58 mHz 8.8 pHz/Hz + 0.58 mHz	HP 3325B/Fluke 910R Anritsu MG6394C/Fluke 910R
Frequency – Measure[4]	1 mHz to 350 MHz 0.35 GHz to 6 GHz 6 GHz to 40 GHz	7.2 pHz/Hz + 58 nHz 7.2 pHz/Hz + 0.58 µHz 11 pHz/Hz + 0.58 Hz	Direct Comparison Keysight 53230A/Fluke 910R
Speed Indicators (Photo)	1 rpm to 200000 rpm	11 µrpm/rpm + 0.58 rpm	HP 3325B/Fluke 910R

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2,6] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
	RF/Microwave		
Absolute Power - Measure[4]	26 dBm to 30 dBm (100 kHz to 4.2 GHz) (4.2 GHz to 18 GHz) (18 GHz to 26.5 GHz) -24 dBm to 26 dBm (100 kHz to 4.2 GHz) (4.2 GHz to 8 GHz) (8 GHz to 12.4 GHz) (12.4 GHz to 18 GHz) (18 GHz to 26.5 GHz)	 0.12 dBm 0.18 dBm 0.22 dBm 0.10 dBm 0.14 dBm 0.15 dBm 0.17 dBm 0.21 dBm	Direct measurement R&S FSMR26, NRP-Z37
Relative Power/Tuned RF Level - Measure[4]	30 dB to -140 dB (100 kHz to 22 GHz) (22 GHz to 26.5 GHz)	 0.014 dB + 0.0058 dB/10 dB 0.022 dB + 0.0058 dB/10 dB	Direct measurement R&S FSMR26, NRP-Z37
Spectral Analysis – Power Measure[4]	(30 to DANL) dBm 20 Hz to 10 MHz 10 MHz to 3.6 GHz 3.6 GHz to 8.0 GHz 8.0 GHz to 22 GHz 22 GHz to 26.5 GHz	 0.55 dB 0.38 dB 0.93 dB 1.2 dB 1.5 dB	Direct Method R&S FSMR26, NRP-Z37
Total Harmonic Distortion – Measure[4]	(0 dB to 100 dB) 100 Hz to 100 kHz	 0.69 dB	Direct Method R&S FSMR26, NRP-Z37
Amplitude Modulation – Measure[4] Carrier Frequency 100 kHz to 10 MHz 10 MHz to 26.5 GHz	 5 % to 99 % (10 Hz to 10 kHz) 5 % to 99 % (90 Hz to 150 Hz) (10 Hz to 50 kHz) (50 kHz to 100 kHz)	 1.5 % 0.4 % 1.0 % 1.5 %	Direct measurement R&S FSMR26, NRP-Z37
Frequency Modulation - Measure[4] Carrier Frequency 100 kHz to 10 MHz 10 MHz to 26.5 GHz	 10 Hz to 10 kHz 10 Hz to 100 kHz 100 kHz to 200 kHz	 1.0 % 1.0 % 3.0 %	

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY[1,2,6] (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
Phase Modulation - Measure[4] Carrier Frequency 100 kHz to 10 MHz 10 MHz to 26.5 GHz	 Up to 1000 rad (10 Hz to 10 kHz) Up to 1000 rad (10 Hz to 5 MHz)	 1.0 % 1.0 %	
Chemical/Gas			
Gas Detection Equipment[7] – O_2	12 % 15 % 18 % 20.9 %	0.86 % 0.76 % 0.77 % 0.69 %	Direct comparison to primary standard gas.
Gas Detection Equipment[7]–CO	20 ppm 50 ppm 60 ppm 100 ppm	0.060 % 0.048 % 0.040 % 0.026 %	
Gas Detection Equipment[7]–H_2S	20 ppm 25 ppm	0.12 % 0.093 %	
Gas Detection Equipment[7] – LEL	50 % 58 %	1.7 % 1.8 %	
Gas Detection Equipment[7] – C_4H_8	100 ppm	2.6 %	

The laboratory also meets the requirements of ANSI/NCSL Z540.3: American National Standard for Calibration – Requirements for the calibration of measuring and test equipment.

[1]The uncertainty covered by the Calibration and Measurement Capability (CMC) is expressed as the expanded uncertainty having a coverage probability of approximately 95 %. It is the smallest measurement uncertainty that a laboratory can achieve within its scope of accreditation when performing calibrations of a best existing device. The measurement uncertainty reported on a calibration certificate may be greater than that provided in the CMC due to the behavior of the calibration item and other factors that may contribute to the uncertainty of a specific calibration.

[2]When uncertainty is stated in relative terms (such as percent, a multiplier expressed as a decimal fraction or in scientific notation), it is in relation to instrument reading or instrument output, as appropriate, unless otherwise indicated.

[3]Capability is suitable for the calibration of measuring devices in the stated ranges.

[4]Capability is suitable for the calibration of devices intended to generate the indicated quantity in the stated ranges.

[5]Metric equivalencies for these ranges and associated CMCs are also available.

[6]In the statement of CMC, L is the length of measurand in inches; D is the diameter in inches/meters; H is the height in inches/meters, and t is the time in seconds.

[7]Also available as site calibration. Note that actual measurement uncertainties achievable at a customer's site can normally be expected to be larger than the uncertainties listed on this Scope of Accreditation.

[8]The actual frequency applied by the calibrator cannot be selected and may be dependent on the measurement device under calibration. Approximate frequency ranges for a given capacitance or capacitance range may be found in the Fluke 552xA's published specifications.

gal = U.S. gallon
TPI = threads per inch
FS = full scale (unless otherwise indicated, the upper value of the range is assumed to be FS)