



CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

Transcat-Dayton
2056 South Alex Road
West Carrollton, OH 45449

Fulfills the requirements of

ISO/IEC 17025:2017

and the national standards

ANSI/NCSL Z540-1-1994 (R2002) AND
ANSI/NCSL Z540.3-2006 (R2013)

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.

A handwritten signature in black ink, appearing to be 'J. Stine', is positioned to the left of the signature line.

Jason Stine, Vice President

Expiry Date: 07 September 2025
Certificate Number: AC-2489.06



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)
ANSI/NCSL Z540.3-2006 (R2013)

Transcat – Dayton
2056 South Alex Road
West Carrollton, OH 45449
Derek Atkinson 937-866-1033

CALIBRATION

Valid to: **September 7, 2025**

Certificate Number: **AC-2489.06**

Chemical Quantities

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
pH Meters	4 pH 7 pH 10 pH	0.012 pH 0.011 pH 0.012 pH	Accredited Buffer Solutions
Conductivity Meters	1 µS/cm 10 µS/cm 100 µS/cm 1 000 µS/cm 1 413 µS/cm 10 000 µS/cm 100 000 µS/cm 150 000 µS/cm 200 000 µS/cm	0.62 µS/cm 0.62 µS/cm 2.1 µS/cm 5.1 µS/cm 5.5 µS/cm 45 µS/cm 410 µS/cm 650 µS/cm 690 µS/cm	Accredited Solutions

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Current – Source ¹	Up to 220 μ A (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz 220 μ A to 2.2 mA (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (2.2 to 22) mA (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (22 to 220) mA (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz 220 mA to 2.2 A 20 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.033 % of reading + 16 nA 0.019 % of reading + 10 nA 0.014 % of reading + 8 nA 0.029 % of reading + 10 nA 0.11 % of reading + 65 nA 0.031 % of reading + 40 nA 0.018 % of reading + 35 nA 0.012 % of reading + 35 nA 0.021 % of reading + 0.11 μ A 0.11 % of reading + 0.65 μ A 0.033 % of reading + 40 nA 0.02 % of reading + 0.35 μ A 0.014 % of reading + 0.35 μ A 0.022 % of reading + 0.55 μ A 0.11 % of reading + 5 μ A 0.04 % of reading + 4 μ A 0.019 % of reading + 3.5 μ A 0.012 % of reading + 2.5 μ A 0.021 % of reading + 3.5 μ A 0.11 % of reading + 10 μ A 0.025 % of reading + 35 μ A 0.045 % of reading + 80 μ A 0.7 % of reading + 0.16 mA	Fluke 5730A Multiproduct Calibrator
AC Current – Source ¹	(2.2 to 11) A 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.047 % of reading + 0.17 mA 0.095 % of reading + 0.38 mA 0.36 % of reading + 0.75 mA	Fluke 5730A Multiproduct Calibrator, Fluke 5725 Amplifier
AC Current – Source ¹	(11 to 20.5) A (10 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz	0.091 % of reading + 3.9 mA 0.12 % of reading + 3.9 mA 2.3 % of reading + 3.9 mA	Fluke 5520A Multiproduct Calibrator
AC Current – Source ¹ Extended Frequency Ranges	(10 to 30) kHz (29 to 330) μ A (0.33 to 3.3) mA (3.3 to 33) mA (33 to 330) mA	1.2 % of reading + 0.31 μ A 0.78 % of reading + 0.47 μ A 0.31 % of reading + 3.1 μ A 0.31 % of reading + 0.16 mA	Fluke 5520A Multiproduct Calibrator

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Clamp-on Ammeters (Toroidal Type) Transformer Type Sensor ¹	(20 to 150) A (45 to 65) Hz (65 to 440) Hz (150 to 1 000) A (45 to 65) Hz (65 to 440) Hz	0.34 % of reading + 30 mA 0.95 % of reading + 47 mA 0.38 % of reading + 0.12 A 1.2 % of reading + 0.22 A	Fluke 5520A Multiproduct Calibrator, Fluke 5500A/COIL 50-turn Coil
AC Clamp-on Ammeters (Non-Toroidal Type) Hall Effect Sensor ¹	(20 to 150) A (45 to 65) Hz (65 to 440) Hz (150 to 1 000) A (45 to 65) Hz (65 to 440) Hz	0.65 % of reading + 0.29 A 1.2 % of reading + 0.29 A 0.68 % of reading + 1 A 1.4 % of reading + 1.1 A	Fluke 5520A Multiproduct Calibrator, Fluke 5500A/COIL 50-turn Coil
AC Current – Measure ¹	Up to 100 μ A (10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz 100 Hz to 5 kHz 100 μ A to 1 mA (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz (1 to 10) mA (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz (10 to 100) mA (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz 100 mA to 1 A (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz	0.46 % of reading + 35 nA 0.17 % of reading + 35 nA 0.072 % of reading + 35 nA 0.072 % of reading + 35 nA 0.46 % of reading + 0.23 μ A 0.17 % of reading + 0.23 μ A 0.071 % of reading + 0.23 μ A 0.038 % of reading + 0.23 μ A 0.46 % of reading + 2.3 μ A 0.17 % of reading + 2.3 μ A 0.071 % of reading + 2.3 μ A 0.038 % of reading + 2.3 μ A 0.48 % of reading + 23 μ A 0.17 % of reading + 23 μ A 0.071 % of reading + 23 μ A 0.037 % of reading + 23 μ A 0.46 % of reading + 0.23 mA 0.19 % of reading + 0.23 mA 0.097 % of reading + 0.23 mA 0.12 % of reading + 0.23 mA	Agilent 3458A Opt. 002 8.5 Digit Multimeter
AC Current – Measure ¹	(1 to 100) A 50 Hz to 1 kHz	0.12 % of reading + 2.3 mA	Ohms Labs CS-100 Current Shunt, Agilent 3458A Opt. 002 8.5 Digit Multimeter

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
DC Current – Source ¹	Up to 220 μ A 220 μ A to 2.2 mA (2.2 to 22) mA (22 to 220) mA 220 mA to 2.2 A	45 μ A/A + 7 nA 39 μ A/A + 8 nA 39 μ A/A + 46 nA 58 μ A/A + 0.7 μ A 0.24 mA/A + 12 μ A	Fluke 5730A Multiproduct Calibrator
DC Current – Source ¹	(2.2 to 11) A	0.4 mA/A + 0.48 mA	Fluke 5730A Multiproduct Calibrator, Fluke 5725 Amplifier
DC Current – Source ¹	(11 to 20) A	0.084 % of reading + 0.58 mA	Fluke 5520A Multiproduct Calibrator
DC Clamp-on Ammeter (Non-Toroidal Type) Hall Effect Sensor ¹	(20 to 150) A (150 to 1 000) A	0.58 % of reading + 0.16 A 0.59 % of reading + 0.58 A	Fluke 5520A Multiproduct Calibrator, Fluke 5500A/Coil 50-turn Coil
DC Current – Measure ¹	Up to 100 μ A 100 μ A to 1 mA (1 to 10) mA (10 to 100) mA 100 mA to 1 A	33 μ A/A + 0.9 nA 29 μ A/A + 5.8 nA 29 μ A/A + 58 nA 46 μ A/A + 0.58 μ A 0.13 mA/A + 12 μ A	Agilent 3458A Opt. 002 8.5 Digit Multimeter
DC Current – Measure ¹	(1 to 100) A	0.012 % of reading + 0.5 mA	Ohms Labs CS-100 Current Shunt, Agilent 3458A Opt. 002 8.5 Digit Multimeter
DC Current – Measure ¹	(100 to 650) A	0.31 % of reading + 10 mA	Canadian Shunt Ind. Ltd. LC-1000-50 Current Shunt, Agilent 3458A Opt. 002 8.5 Digit Multimeter
DC Resistance – Source ¹ (Fixed Artifacts)	1 m Ω 10 m Ω 100 m Ω	0.16 m Ω / Ω 0.16 m Ω / Ω 0.16 m Ω / Ω	Standard Resistors
DC Resistance – Source ¹ (Variable Artifact)	(1 to 10) G Ω (10 to 100) G Ω 100 G Ω to 1 T Ω	0.58 % of reading + 1.2 $\mu\Omega$ / Ω /V 1.2 % of reading + 2.3 $\mu\Omega$ / Ω /V 1.2 % of reading + 5.8 $\mu\Omega$ / Ω /V	IET HRRS-B-7-100k-5kV Decade Resistor (V is the DUT Voltage)
DC Resistance – Source/Measure ¹	Up to 25 Ω (25 to 400) Ω 400 Ω to 1 k Ω (1 to 40) k Ω	56 $\mu\Omega$ 2.1 $\mu\Omega$ / Ω 4.4 $\mu\Omega$ / Ω 10 $\mu\Omega$ / Ω	Hart 1590 Super Thermometer, Reference Resistors



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Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Resistance – Source/Measure ¹	Up to 10 Ω (10 to 100) Ω 100 Ω to 1 kΩ (1 to 10) kΩ (10 to 100) kΩ 100 kΩ to 1 MΩ (1 to 10) MΩ (10 to 100) MΩ 100 MΩ to 1 GΩ	18 μΩ/Ω + 58 μΩ 15 μΩ/Ω + 0.58 mΩ 13 μΩ/Ω + 0.58 mΩ 12 μΩ/Ω + 5.8 mΩ 13 μΩ/Ω + 58 mΩ 21 μΩ/Ω + 2.3 Ω 62 μΩ/Ω + 0.12 kΩ 0.059 % of reading + 1.2 kΩ 0.82 % of reading + 12 kΩ	Agilent 3458A 8.5 Digit Multimeter, Decade Resistor
AC Voltage – Source ¹	Up to 2.2 mV (10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz (2.2 to 22) mV (10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz (22 to 220) mV (10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz	0.16 % of reading + 4 μV 0.1 % of reading + 4 μV 0.078 % of reading + 4 μV 0.13 % of reading + 4 μV 0.17 % of reading + 5 μV 0.33 % of reading + 10 μV 0.47 % of reading + 20 μV 0.58 % of reading + 20 μV 0.044 % of reading + 4 μV 0.031 % of reading + 4 μV 0.015 % of reading + 4 μV 0.031 % of reading + 4 μV 0.059 % of reading + 5 μV 0.12 % of reading + 10 μV 0.16 % of reading + 20 μV 0.3 % of reading + 20 μV 0.028 % of reading + 12 μV 0.011 % of reading + 7 μV 0.007 % of reading + 7 μV 0.013 % of reading + 7 μV 0.033 % of reading + 17 μV 0.068 % of reading + 20 μV 0.14 % of reading + 25 μV 0.28 % of reading + 45 μV	Fluke 5730A Multiproduct Calibrator



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Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage – Source ¹	220 mV to 2.2 V (10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz (2.2 to 22) V (10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz	0.028 % of reading + 40 μV 0.01 % of reading + 15 μV 0.005 % of reading + 8 μV 0.008 % of reading + 10 μV 0.01 % of reading + 30 μV 0.035 % of reading + 80 μV 0.1 % of reading + 0.2 mV 0.18 % of reading + 0.3 mV 0.028 % of reading + 0.4 mV 0.01 % of reading + 0.15 mV 0.005 % of reading + 50 μV 0.008 % of reading + 0.1 mV 0.008 % of reading + 0.2 mV 0.03 % of reading + 0.6 mV 0.1 % of reading + 2 mV 0.17 % of reading + 3.2 mV	Fluke 5730A Multiproduct Calibrator
AC Voltage – Source ¹	(22 to 220) V (10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz (220 to 750) V (30 to 50) kHz (50 to 100) kHz (220 to 1 100) V 40 Hz to 1 kHz (1 to 20) kHz (20 to 30) kHz	0.028 % of reading + 4 mV 0.01 % of reading + 1.5 mV 0.006 % of reading + 0.6 mV 0.009 % of reading + 1 mV 0.016 % of reading + 2.5 mV 0.09 % of reading + 16 mV 0.44 % of reading + 40 mV 0.8 % of reading + 80 mV 0.061 % of reading + 11 mV 0.23 % of reading + 45 mV 0.011 % of reading + 4 mV 0.017 % of reading + 6 mV 0.061 % of reading + 11 mV	Fluke 5730A Multiproduct Calibrator, Fluke 5725A Amplifier



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Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage – Measure ¹	Up to 10 mV		Agilent 3458A 8.5 Digit Multimeter
	(1 to 40) Hz	0.04 % of reading + 3.5 μV	
	40 Hz to 1 kHz	0.03 % of reading + 1.2 μV	
	(1 to 20) kHz	0.04 % of reading + 1.2 μV	
	(20 to 50) kHz	0.15 % of reading + 1.2 μV	
	(50 to 100) kHz	0.59 % of reading + 1.2 μV	
	(100 to 300) kHz	4.6 % of reading + 2.3 μV	
	300 kHz to 1 MHz	1.5 % of reading + 5.8 μV	
	(1 to 4) MHz	8.1 % of reading + 8.1 μV	
	(10 to 100) mV		
	(1 to 40) Hz	0.013 % of reading + 4.6 μV	
	40 Hz to 1 kHz	0.009 7 % of reading + 2.3 μV	
	(1 to 20) kHz	0.017 % of reading + 2.3 μV	
	(20 to 50) kHz	0.038 % of reading + 2.3 μV	
	(50 to 100) kHz	0.093 % of reading + 2.3 μV	
	(100 to 300) kHz	0.36 % of reading + 12 μV	
	300 kHz to 1 MHz	1.2 % of reading + 12 μV	
	(1 to 2) MHz	1.8 % of reading + 12 μV	
	(2 to 4) MHz	4.7 % of reading + 81 μV	
	(4 to 8) MHz	4.7 % of reading + 92 μV	
	(8 to 10) MHz	17 % of reading + 0.12 mV	
	100 mV to 1 V		
	(1 to 40) Hz	0.008 8 % of reading + 46 μV	
	40 Hz to 1 kHz	0.008 3 % of reading + 23 μV	
(1 to 20) kHz	0.017 % of reading + 23 μV		
(20 to 50) kHz	0.036 % of reading + 23 μV		
(50 to 100) kHz	0.093 % of reading + 23 μV		
(100 to 300) kHz	0.35 % of reading + 0.12 mV		
300 kHz to 1 MHz	1.2 % of reading + 0.12 mV		
(1 to 2) MHz	1.8 % of reading + 0.12 mV		
(2 to 4) MHz	4.6 % of reading + 0.81 mV		
(4 to 8) MHz	4.6 % of reading + 0.92 mV		
(8 to 10) MHz	17 % of reading + 1.2 mV		

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage – Measure ¹	(1 to 10) V		Agilent 3458A 8.5 Digit Multimeter
	(1 to 40) Hz	0.009 5 % of reading + 0.46 mV	
	40 Hz to 1 kHz	0.023 % of reading + 0.23 mV	
	(1 to 20) kHz	0.017 % of reading + 0.23 mV	
	(20 to 50) kHz	0.036 % of reading + 0.23 mV	
	(50 to 100) kHz	0.093 % of reading + 0.23 mV	
	(100 to 300) kHz	0.35 % of reading + 1.2 mV	
	300 kHz to 1 MHz	1.2 % of reading + 1.2 mV	
	(1 to 2) MHz	1.8 % of reading + 1.2 mV	
	(2 to 4) MHz	4.6 % of reading + 8.1 mV	
	(4 to 8) MHz	4.6 % of reading + 9.2 mV	
	(8 to 10) MHz	17 % of reading + 12 mV	
	(10 to 100) V		
	(1 to 40) Hz	0.024 % of reading + 4.6 mV	
	40 Hz to 1 kHz	0.024 % of reading + 2.3 mV	
(1 to 20) kHz	0.024 % of reading + 2.3 mV		
(20 to 50) kHz	0.041 % of reading + 2.3 mV		
(50 to 100) kHz	0.14 % of reading + 2.3 mV		
(100 to 300) kHz	0.46 % of reading + 12 mV		
300 kHz to 1 MHz	1.7 % of reading + 12 mV		
(100 to 700) V			
(1 to 40) Hz	0.048 % of reading + 46 mV		
40 Hz to 1 kHz	0.048 % of reading + 23 mV		
(1 to 20) kHz	0.071 % of reading + 23 mV		
(20 to 50) kHz	0.19 % of reading + 23 mV		
(50 to 100) kHz	0.35 % of reading + 23 mV		
AC High Voltage – Measure ¹	700 V to 10 kV (30 to 200) Hz (200 to 450) Hz	0.17 % of reading + 2.1 V 0.47 % of reading + 2.1 V	Vitrek 4700 Digital HV Meter
AC High Voltage – Measure ¹	(10 to 30) kV (30 to 200) Hz (200 to 450) Hz	0.13 % of reading + 37 V 0.71 % of reading + 37 V	Vitrek 4700 Digital HV Meter, Vitrek HVP-35 High Voltage Probe
AC High Voltage – Measure ¹	(30 to 50) kV (30 to 100) Hz (100 to 200) Hz	0.13 % of reading + 55 V 0.7 % of reading + 55 V	Vitrek 4700 Digital HV Meter, Vitrek HVL-70 High Voltage Probe
AC High Voltage – Measure ¹	(50 to 75) kV (30 to 70) Hz (70 to 200) Hz	0.16 % of reading + 0.16 kV 1.2 % of reading + 0.16 kV	Vitrek 4700 Digital HV Meter, Vitrek HVL-100 High Voltage Probe



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Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
DC Voltage – Source ¹	Up to 220 μ V 220 μ V to 2.2 V (2.2 to 11) V (11 to 22) V (22 to 220) V	9.1 μ V/V + 0.4 μ V 5.7 μ V/V + 0.7 μ V 4.4 μ V/V + 2.5 μ V 4 μ V/V + 4 μ V 6.3 μ V/V + 40 μ V	Fluke 5730A Multiproduct Calibrator
DC Voltage – Source ¹	(220 to 1 100) V	7.6 μ V/V + 0.4 mV	Fluke 5730A Multiproduct Calibrator, Fluke 5725A Amplifier
DC Voltage – Measure ¹	Up to 100 mV 100 mV to 1 V (1 to 10) V (10 to 100) V (100 to 500) V (500 to 800) V (800 to 1 000) V	8.3 μ V/V + 0.58 μ V 5.3 μ V/V + 0.58 μ V 5.3 μ V/V + 0.58 μ V 7.7 μ V/V + 35 μ V 15 μ V/V + 0.12 mV 18 μ V/V + 0.12 mV 21 μ V/V + 0.12 mV	Agilent 3458A 8.5 Digit Multimeter
DC High Voltage – Measure ¹	(1 to 10) kV	0.036 % of reading + 2.1 V	Vitrek 4700 Digital HV Meter
DC High Voltage – Measure ¹	(10 to 35) kV	0.041 % of reading + 37 V	Vitrek 4700 Digital HV Meter, Vitrek HVP-35 High Voltage Probe
DC High Voltage – Measure ¹	(35 to 70) kV	0.038 % of reading + 55 V	Vitrek 4700 Digital HV Meter, Vitrek HVL-70 High Voltage Probe
DC High Voltage – Measure ¹	(70 to 100) kV	0.063 % of reading + 0.16 kV	Vitrek 4700 Digital HV Meter, Vitrek HVL-100 High Voltage Probe
Capacitance – Source ¹ (Simulation)	10 Hz to 10 kHz 190 pF to 1.1 nF 10 Hz to 3 kHz (1.1 to 3.3) nF	0.4 % of reading + 7.8 pF 0.4 % of reading + 7.8 pF	Fluke 5520A Multiproduct Calibrator



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Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Capacitance – Source ¹ (Simulation)	10 Hz to 1 kHz (3.3 to 11) nF	0.22 % of reading + 7.8 pF	Fluke 5520A Multiproduct Calibrator
	(11 to 33) nF	0.22 % of reading + 78 pF	
	(33 to 110) nF	0.22 % of reading + 78 pF	
	(110 to 330) nF	0.22 % of reading + 0.23 nF	
	(10 to 600) Hz 330 nF to 1.1 μF	0.22 % of reading + 0.78 nF	
	(10 to 300) Hz (1.1 to 3.3) μF	0.22 % of reading + 2.3 nF	
	(10 to 150) Hz (3.3 to 11) μF	0.22 % of reading + 7.8 nF	
	(10 to 120) Hz (11 to 33) μF	0.33 % of reading + 23 nF	
	(10 to 80) Hz (33 to 110) μF	0.42 % of reading + 78 μF	
	DC to 50 Hz (110 to 330) μF	0.42 % of reading + 0.23 μF	
	DC to 20 Hz 330 μF to 1.1 mF	0.36 % of reading + 0.78 μF	
	DC to 6 Hz (1.1 to 3.3) mF	0.35 % of reading + 2.3 μF	
	DC to 2 Hz (3.3 to 11) mF	0.35 % of reading + 7.8 μF	
	DC to 600 mHz (11 to 33) mF	0.58 % of reading + 23 μF	
	DC to 200 mHz (33 to 110) mF	0.85 % of reading + 78 μF	
Electrical Simulation of Thermocouple Indicating Devices – Measure/Source ¹	Type B (250 to 350) °C	1.2 °C	Ectron 1140A Thermocouple Calibrator/Simulator
	(350 to 445) °C	0.9 °C	
	(445 to 580) °C	0.71 °C	
	(580 to 750) °C	0.55 °C	
	(750 to 1 000) °C	0.45 °C	
	(1 000 to 1 820) °C	0.35 °C	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Electrical Simulation of Thermocouple Indicating Devices – Measure/Source ¹	Type C		Ectron 1140A Thermocouple Calibrator/Simulator
	(0 to 250) °C	0.24 °C	
	(250 to 1 000) °C	0.19 °C	
	(1 000 to 1 500) °C	0.21 °C	
	(1 500 to 1 800) °C	0.24 °C	
	(1 800 to 2 000) °C	0.27 °C	
	(2 000 to 2 250) °C	0.33 °C	
	(2 250 to 2 315) °C	0.37 °C	
	Type E		
	(-270 to -245) °C	1.6 °C	
	(-245 to -195) °C	0.24 °C	
	(-195 to -155) °C	0.12 °C	
	(-155 to -90) °C	0.09 °C	
	(-90 to 0) °C	0.08 °C	
	(0 to 15) °C	0.08 °C	
	(15 to 890) °C	0.06 °C	
	(890 to 1 000) °C	0.07 °C	
	Type J		
	(-210 to -180) °C	0.15 °C	
	(-180 to -120) °C	0.12 °C	
	(-120 to -50) °C	0.09 °C	
	(-50 to 990) °C	0.08 °C	
	(990 to 1 200) °C	0.09 °C	
	Type K		
	(-270 to -255) °C	2.5 °C	
	(-255 to -195) °C	0.85 °C	
	(-195 to -115) °C	0.16 °C	
	(-115 to -55) °C	0.12 °C	
(-55 to 1 000) °C	0.09 °C		
(1 000 to 1 372) °C	0.1 °C		
Type N			
(-270 to -260) °C	5.4 °C		
(-260 to -200) °C	1.5 °C		
(-200 to -140) °C	0.29 °C		
(-140 to -70) °C	0.18 °C		
(-70 to 25) °C	0.14 °C		
(-25 to 160) °C	0.12 °C		
(160 to 1 300) °C	0.11 °C		



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Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment	
Electrical Simulation of Thermocouple Indicating Devices – Measure/Source ¹	Type R		Ectron 1140A Thermocouple Calibrator/Simulator	
	(-50 to -30) °C	0.8 °C		
	(-30 to 45) °C	0.69 °C		
	(45 to 160) °C	0.49 °C		
	(160 to 380) °C	0.35 °C		
	(380 to 775) °C	0.3 °C		
	(775 to 1 768) °C	0.26 °C		
	Type S			
	(-50 to -30) °C	0.76 °C		
	(-30 to 45) °C	0.68 °C		
	(45 to 105) °C	0.49 °C		
	(105 to 310) °C	0.41 °C		
	(310 to 615) °C	0.35 °C		
	(615 to 1 768) °C	0.31 °C		
	Type T			
(-270 to -255) °C	1.9 °C			
(-255 to -240) °C	0.6 °C			
(-240 to -210) °C	0.36 °C			
(-210 to -150) °C	0.22 °C			
(-150 to -40) °C	0.15 °C			
(-40 to 100) °C	0.09 °C			
(100 to 400) °C	0.08 °C			
DC Power – Source ¹	330 μW to 330 mA	11 μW to 1.1 mW	0.024 % of reading	Fluke 5520A Multiproduct Calibrator
		(1.1 to 110) mW	0.027 % of reading	
		110 mW to 110 W	0.024 % of reading	
		(110 to 330) W	0.018 % of reading	
	330 mA to 3 A	11 μW to 110 mW	0.044 % of reading	
		110 mW to 990 W	0.053 % of reading	
		990 W to 3 kW	0.01 % of reading	
	(3 to 20.5) A	99 mW to 0.99 W	0.088 % of reading	
		0.99 W to 6.8 kW	0.07 % of reading	
	(6.8 to 20.5) kW	0.04 % of reading		



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Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment	
AC Power – Source ^{1,2} PF = 1				
(3.3 to 9) mA	(10 to 65) Hz 110 μW to 3 mW 3 mW to 9 W	0.13 % of reading 0.077 % of reading	Fluke 5520A Multiproduct Calibrator	
(9 to 33) mA	(10 to 65) W 300 μW to 10 mW 10 mW to 33 W	0.089 % of reading 0.077 % of reading		
(33 to 90) mA	(10 to 65) Hz (1 to 30) mW 30 mW to 90 W	0.071 % of reading 0.057 % of reading		
(90 to 330) mA	(10 to 65) Hz (3 to 100) mW 100 mW to 300 W	0.089 % of reading 0.078 % of reading		
(330 to 900) mA	(10 to 65) Hz (11 to 300) mW 300 mW to 900 W	0.071 % of reading 0.081 % of reading		
900 mA to 2.2 A	(10 to 65) Hz (30 to 720) mW 0.72 W to 2 kW	0.089 % of reading 0.079 % of reading		
(2.2 to 4.5) A	(10 to 65) Hz 80 mW to 1.4 W 1.4 W to 4.5 kW	0.088 % of reading 0.18 % of reading		
(4.5 to 20.5) A	(10 to 65) Hz 150 mW to 20kW	0.17 % of reading		
Phase – Source ¹	Up to 180 ° (10 to 65) Hz (65 to 500) Hz 500 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 20) kHz	0.11 ° 0.2 ° 0.4 ° 1.9 ° 3.9 ° 7.8 °		Fluke 5520A Multiproduct Calibrator
Oscilloscopes ^{1,3} Amplitude – DC into 50 Ω load into 1 MΩ load	(-6 to 6) V (-130 to 130) V	0.2 % of reading + 31 μV 0.04 % of reading + 31 μV		Fluke 5520A/11 Multiproduct Calibrator with 1.1 GHz Scope Option

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Oscilloscopes ^{1,3} Amplitude – Square Wave into 50 Ω load into 1 MΩ load Time Markers into 50 Ω load Rise Time into 50 Ω load Rate: 1 kHz to 2 MHz Rate: 2 MHz to 10 MHz Leveled Sine Wave into 50 Ω load Bandwidth/Flatness (50 kHz Reference) into 50 Ω load	10 Hz to 100 kHz 1 mVp-p to 6.6 Vp-p	0.19 % of reading + 31 μV	Fluke 5520A/11 Multiproduct Calibrator with 1.1 GHz Scope Option
	10 Hz to 1 kHz 1 mVp-p to 6.6 Vp-p (1 kHz to 10) kHz 1 mVp-p to 6.6 Vp-p	0.08 % of reading + 31 μV 0.19 % of reading + 31 μV	
	1 ns to 20 ms	0.000 22 % of reading	
	50 ms	0.005 9 % of reading	
	0.1 s	0.009 8 % of reading	
	0.2 s	0.018 % of reading	
	0.5 s	0.041 % of reading	
	1 s	0.08 % of reading	
	2 s	0.16 % of reading	
	5 s	0.39 % of reading	
5 mVp-p to 2.5 Vp-p 250 ps (nominal)	50 ps		
5 mVp-p to 5 Vp-p 50 kHz	1.8 % of reading + 0.23 mV		
50 kHz to 100 MHz (100 to 300) MHz (300 to 600) MHz	2.8 % of reading + 0.23 mV 3.2 % of reading + 0.23 mV 4 % of reading + 0.23 mV		
5 mVp-p to 3.5 Vp-p 600 MHz to 1.1 GHz	5.5 % of reading + 0.2 mV		
5 mVp-p to 5.5 Vp-p 50 kHz to 100 MHz (100 to 300) MHz (300 to 600) MHz	1.4 % of reading + 78 μV 1.8 % of reading + 78 μV 3.2 % of reading + 78 μV		
5 mVp-p to 3.5 Vp-p 600 MHz to 1.1 GHz	4 % of reading + 78 μV		

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Oscilloscopes ^{1,3} Input Impedance – Measure	(40 to 60) Ω 500 k Ω to 1.5 M Ω	0.082 % of reading 0.081 % of reading	Fluke 5520A/11 Multiproduct Calibrator with 1.1 GHz Scope Option
Input Capacitance – Measure	(5 to 50) pF	3.9 % of reading + 0.39 pF	
Waveform Generator (Sine, Square, Triangle) Amplitude	10 Hz to 10 kHz		
into 50 Ω load	1.8 mVp-p to 2.5 Vp-p	2.3 % of reading + 78 μ V	
into 1 M Ω load	1.8 mVp-p to 55 Vp-p	2.3 % of reading + 78 μ V	
Frequency	10 Hz to 10 kHz	0.002 % of reading + 12 mHz	

Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Angle – Source ^{1,4}	Up to 75° 90°	6.6" 2.7"	Angle Blocks Master Square
Angle – Measure ¹	Up to 360°	0.25°	Digital Protractor
Gage Blocks ⁴ (Steel and Chrome)	(0.01 to 1) in (1 to 4) in	3.3 μ in (1.7 + 1.4L) μ in	Gage Block Comparator, Master Gage Blocks
Long Gage Blocks ⁴ (Steel Only)	(4 to 20) in	(5.5 + 1.4L) μ in	Gage Block Comparator, Master Gage Blocks
Calipers, Micrometers ^{1,4} Travel (Outside, Inside, Depth, Step)	Up to 0.4 in (0.4 to 1) in (1 to 4) in (4 to 40) in	(8 + 1L) μ in (7 + 2L) μ in (4 + 5L) μ in (8 + 5L) μ in	Gage Blocks
Anvil Flatness	Up to 1 in diameter	6.4 μ in	Optical Flats
Anvil Parallelism	Up to 1 in diameter	11 μ in	Optical Parallels
Indicators ^{1,4} (Dial, Digital, Drop, Snap)	Up to 1 in (1 to 4) in (4 to 24) in	(31 + 0.3L) μ in (29 + 3L) μ in (25 + 4L) μ in	Gage Blocks, Amplifier
Test Indicators	Up to 0.05 in	6.1 μ in	Universal Length Measuring Machine



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Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Height Gages ^{1,4}	Up to 1 in (1 to 4) in (4 to 24) in	(31 + 0.3L) μin (29 + 3L) μin (25 + 4L) μin	Gage Blocks, Amplifier
Height Masters, Caliper Masters, 1-2-3 Blocks, Parallels ¹	Up to 4 in (4 to 24) in	(52 + 0.5L) μin (41 + 3.7L) μin	Gage Blocks, Amplifier
Length – Single Axis ⁴ Outside Dimension	Up to 1 in (1 to 7) in (7 to 12) in	(6 + 1.3L) μin (4.5 + 4L) μin (2 + 4L) μin	Universal Length Measuring Machine
Inside Dimension	(0.04 to 0.125) in (0.125 to 0.25) in (0.25 to 1) in (1 to 2.5) in (2.5 to 10) in (10 to 14) in	11 μin 11 μin 11 μin 18 μin (18 + 3L) μin (39 + 3L) μin	
Cylindrical Plugs	Up to 1 in (1 to 7) in	12 μin (11 + 3L) μin	Universal Length Measuring Machine
Cylindrical Rings ⁴	(0.04 to 0.125) in (0.125 to 0.25) in (0.25 to 1) in (1 to 2.5) in (2.5 to 10) in (10 to 14) in	11 μin 11 μin 11 μin 18 μin (18 + 3L) μin (39 + 3L) μin	Universal Length Measuring Machine
Thread Wires (2 to 120) TPI	(0.008 33 to 0.5) in	12 μin	Universal Length Measuring Machine
Thread Plug Gages ⁴ Pitch Diameter – 60 ° Thread	Up to 1 in (1 to 4) in (4 to 7) in	79 μin 81 μin 84 μin	Universal Length Measuring Machine, Master Thread Wires
Major Diameter	Up to 1 in (1 to 7) in	13 μin (10 + 3L) μin	
Thread Ring Gages Inner Pitch Diameter	Up to 1 in (1 to 4) in (4 to 7) in	79 μin 81 μin 84 μin	Master Thread Setting Plug Uncertainty



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Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Surface Plates ^{1,4}			
Overall Flatness	(17 to 100) inDL	$(24 + \sqrt{DL}) \mu\text{in}$	In accordance with ASME B89.3.7 using Electronic Level System
Local Area Flatness (Repeat Readings)	Up to 0.001 in	33 μin	Supramess with Repeat-o-Meter
Optical Comparators ^{1,4}			
X-Y Length	Up to 12 in	$(80 + 19L) \mu\text{in}$	Calibration Grids
Squareness	(0.04 to 0.5) in (0.5 to 1) in	$(110 + 1L) \mu\text{in}$ $(112 + 1.5L) \mu\text{in}$	Calibration Grids
Magnification	10X to 50X	$(240 + 21L) \mu\text{in}$	Magnification Scale, Reticle
Flatness, Straightness, Parallelism ¹	Up to 18 in	36 μin	Gage Amplifier, Surface Plate
Optical Flats/Parallels			
Flatness	Up to 3 in	2.7 μin	Master Optical Flat, Universal Length Measuring Machine
Parallelism	Up to 2 in	2.8 μin	

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Viscosity Cups ⁵ (Kinematic Viscosity)	18 mm ² /s (cSt) 32 mm ² /s (cSt) 65 mm ² /s (cSt) 117 mm ² /s (cSt) 230 mm ² /s (cSt) 392 mm ² /s (cSt) 734 mm ² /s (cSt)	0.57 % of reading 0.78 % of reading 0.62 % of reading 0.75 % of reading 0.91 % of reading 1.1 % of reading 0.82 % of reading	Accredited Viscosity Standards (Nominal at 25°C)
Force Gages – Tension/Compression	(0.1 to 200) lbf	0.033 % of reading	NIST Class F Weights

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Mass (Metric)	0.5 kg 1 kg 2 kg 5 kg 10 kg 20 kg 30 kg	11 mg 11 mg 15 mg 22 mg 0.2 g 0.3 g 0.3 g	Echelon III
Mass (Avoirdupois)	1 lb 2 lb 3 lb 5 lb 10 lb 20 lb 30 lb 50 lb 65 lb	10 mg 10 mg 10 mg 10 mg 20 mg 0.2 g 0.2 g 0.2 g 0.3 g	Echelon III
Balances and Scales ^{1,5} (Metric)	Up to 500 mg (0.5 to 10) g (10 to 30) g (30 to 50) g (50 to 200) g (200 to 500) g (0.5 to 5) kg (5 to 25) kg	4.7 µg 20 µg 40 µg 75 µg 0.22 mg 0.62 mg 3.7 mg 61 mg	ASTM E617 Class 1 & Class 2 weights and internal calibration procedure utilized for the calibration of the weighing system.
Balances and Scales ^{1,5} (Avoirdupois)	(0.5 to 500) lb	0.033 % of reading	NIST Class F weights and internal calibration procedure utilized for the calibration of the weighing system.
Rockwell Hardness Testers ¹	HRC Low Middle High HRBW Low Middle High	0.45 HRC 0.45 HRC 0.34 HRC 0.56 HRBW 0.47 HRBW 0.53 HRBW	Indirect verification per ASTM E18 using Test Blocks
Pressure – Absolute ¹	(0 to 30) psia (30 to 300) psia (300 to 1 000) psia	0.002 6 psi 0.008 9 % of reading 0.01 % of reading	DHI RPM4 Pressure Calibrator, Pressure Controller



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Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Pressure – Hydraulic ¹	(200 to 1 600) psig (1 600 to 16 200) psig	0.091 psi 0.006 % of reading	Fluke P3125-PSI Deadweight Tester
Pressure – Pneumatic ¹	(-15 to 30) psig (30 to 300) psi (300 to 1 000) psig	0.002 2 psi 0.007 5 % of reading 0.01 % of reading	DHI RPM4 Pressure Calibrator, Pressure Controller
Pressure – Pneumatic ¹	(-60 to -22) inH ₂ O (-22 to 22) inH ₂ O (22 to 60) inH ₂ O	0.01 % of reading 0.002 2 inH ₂ O 0.01 % of reading	DHI PPC4 Pressure Controller
Pressure – Pneumatic ¹	(22 to 60) inH ₂ O (60 to 72) inH ₂ O (72 to 832) inH ₂ O	0.01 % of reading 0.006 7 inH ₂ O 0.01 % of reading	DHI PPC4 Pressure Controller
Torque Measuring Equipment ¹	(0.2 lbf·in to 5) lbf·in	1.7 % of reading + 0.002 3 lbf·in	Tohnichi TDT60CN3-G Digital Torque Driver Tester
Torque Measuring Equipment ¹	(2 to 50) lbf·in	1.4 % of reading + 0.006 lbf·in	Tohnichi TDT600CN3-G Digital Torque Driver Tester
Torque Measuring Equipment ¹	(4 to 50) lbf·in (30 to 400) lbf·in (80 to 1 000) lbf·in (20 to 250) lbf·ft (60 to 600) lbf·ft	0.46 % of reading 0.46 % of reading 0.46 % of reading 0.46 % of reading 0.48 % of reading	CDI Torque Calibration System
Torque Calibration Systems	(2.5 to 50) lbf·in (4.2 to 250) lbf·ft (250 to 800) lbf·ft	0.2 % of reading 0.2 % of reading 0.2 % of reading	Torque Wheels, Torque Arm, NIST Class F Weights

Thermodynamic

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Relative Humidity – Measure ¹	(-10 to 15) °C Up to 95 %RH (15 to 25) °C (0 to 90) %RH (90 to 95) %RH (25 to 40) °C Up to 50 %RH (50 to 75) %RH (75 to 95) %RH	2.1 %RH 1.3 %RH 2 %RH 1.7 %RH 2 %RH 2.3 %RH	Thermohygrometer

Thermodynamic

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Relative Humidity – Source	(-10 to 15) °C		Humidity Generator
	(10 to 75) %RH	0.5 %RH	
	(75 to 95) %RH	0.65 %RH	
	(15 to 35) °C		
	(10 to 95) %RH	0.5 %RH	
	(35 to 70) °C		
Temperature – Measure ¹	(-100 to 0.01) °C	11 mK	PRT, Precision Indicator
	(0.01 to 230) °C	19 mK	
	(230 to 420) °C	25 mK	
	(420 to 660) °C	36 mK	
Temperature – Measure ¹	(600 to 980) °C	0.87 % of reading + 1 °C	Type K Thermocouple Probe, Thermocouple Indicator
Thermocouple Probe, RTD, PRT, Thermistor	(-80 to -40) °C	1.9 mK	Precision Bath, SPRT
	(-40 to 100) °C	1.4 mK	
	(100 to 270) °C	2.4 mK	
	(270 to 400) °C	5.6 mK	
Thermocouple Probe, RTD, PRT, Thermistor	(400 to 600) °C	22 mK	Furnace, SPRT
Infrared Temperature Measuring Devices	(-15 to 0) °C	0.8 °C	Black Body (flat plate) $\epsilon = (0.9 \text{ to } 1)$, $\lambda = (8 \text{ to } 14) \mu\text{m}$
	(0 to 50) °C	0.65 °C	
	(50 to 100) °C	0.7 °C	
	(100 to 120) °C	0.76 °C	
	(120 to 200) °C	0.95 °C	
	(200 to 350) °C	1.6 °C	
SPRT/PRT Calibration by Fixed Point	0.01 °C	0.6 mK	Comparison TPW Cell
	156.598 °C	1.9 mK	Comparison to In Cell
	231.928 °C	2.1 mK	Comparison to Sn Cell
	419.527 °C	3.5 mK	Comparison to Zn Cell
	660.323 °C	8.6 mK	Comparison to Al Cell
SPRT/PRT Calibration by Comparison	-195 °C	2.4 mK	Hart 5681 SPRT, NBPLN ₂

Thermodynamic

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
SPRT/PRT Calibration by Comparison	-80 °C	1.9 mK	Hart 5681 SPRT, Precision Bath
SPRT/PRT Calibration by Comparison	-38.8 °C	1.2 mK	

Time and Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Rise Time – Measure ¹	≥ 5 ns	4 ns	Agilent DSO5012 Digital Oscilloscope
Frequency – Source/Measure	10 MHz	5.9 mHz	Comparison to Stanford Research FS725 Rubidium Frequency Standard
Frequency – Measure ¹	1 Hz to 10 kHz 10 kHz to 10 MHz 10 MHz to 225 MHz	0.64 nHz/Hz + 4.5 μHz 0.64 nHz/Hz + 5 μHz 0.64 nHz/Hz	Agilent 53132A Universal Counter, Characterized with Stanford Research FS725 Rubidium Frequency Standard
Frequency – Source ¹	1 Hz to 80 MHz	58 nHz/Hz	Agilent 33250A Arbitrary Waveform Generator characterized with Stanford Research FS725 Rubidium Frequency Standard
Period – Measure ¹	(1 to 100) s	45 μs	Agilent 53132A Universal Counter, Characterized with Stanford Research FS725 Rubidium Frequency Standard
Period – Source ¹	(1 to 100) s	58 ns/s	Agilent 33250A Arbitrary Waveform Generator characterized with Stanford Research FS725 Rubidium Frequency Standard



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Time and Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Non-contact Rate of Rotation ^{1,4}	(5 to 100) rpm (100 to 1 000) rpm (1 000 to 10 000) rpm (10 000 to 100 000) rpm (100 000 to 200 000) rpm	0.012 % of reading + 0.001 2 rpm 0.012 % of reading + 0.012 rpm 0.012 % of reading + 0.12 rpm 0.014 % of reading + 1.2 rpm 0.014 % of reading + 12 rpm	Comparison to Master Non-contact/Laser Tachometer
Stopwatches, Timers	Up to 599 s/mon	58 ms/d	Helmut Klein/Vibrograf TM-4500 Timometer
AC Duty Cycle – Source ¹ Square Wave: < 3.3 Vp-p Freq: 0.1 Hz to 100 kHz	(1 to 10) % Duty Cycle 10 μs to 100 s (10 to 49) % Duty Cycle 10 μs to 100 s 50 % Duty Cycle 10 μs to 100 s (51 to 90) % Duty Cycle 10 μs to 100 s (90 to 99) % Duty Cycle 10 μs to 100 s	0.039 % of reading + 78 ns 0.62 % of reading + 78 ns 0.001 6 % of reading + 78 ns 0.62 % of reading + 78 ns 0.039 % of reading + 78 ns	Fluke 5522A Multiproduct Calibrator

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. The uncertainties shown are for the most favorable conditions. There is an increase in uncertainty that corresponds to the laboratory's AC voltage and current uncertainties at different frequencies other than the ones shown. Power factors (PF) other than the one shown contribute to the power uncertainty. PF is related to the cosine of phase. Therefore, uncertainties track the laboratory's phase uncertainty closely at PF near one but are magnified heavily as PF approaches zero. The lab may also report reactive power, apparent power, and power factor under this accreditation. If needed, contact laboratory for more information regarding uncertainties at frequency and power factor combinations other than the ones shown.
3. The stated uncertainty is the laboratory's ability to source a fast rise pulse that is approximately 250 ps. In the typical application of measuring rise time of an oscilloscope, this value is one of the contributing factors, but other factors are derived from the DUT.
4. L = length in inches; DL = diagonal length in inches; " = arc-second; rpm = revolutions per minute.
5. These numbers are nominal in nature. Uncertainty will reflect actual values reported.
6. Transcat-Dayton is a part of the legal entity of Transcat, Inc.
7. This scope is formatted as part of a single document including Certificate of Accreditation No. AC-2489.06.

Jason Stine, Vice President