SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

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CALIBRATION

Valid to: **April 17, 2027** Certificate Number: **AC-2671**

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Current – Measure [1] (50/60 Hz)	Up to 0.5 A (0.5 to 4) A (4 to 40) A (40 to 100) A (100 to 200) A (200 to 400) A	17 mA 73 mA 0.73 A 2.1 A 5.5 A 19 A	Comparison to Extech 380947 AC/DC Clamp Meter
DC Current – Measure [1]	(0 to 5) A (5 to 20) A (20 to 40) A (40 to 100) A (100 to 150) A (150 to 200) A (200 to 400) A	82 mA 0.26 A 0.49 A 1.4 A 2 A 5.4 A 19 A	Comparison to Extech 380947 AC/DC Clamp Meter
Electrical Simulation of RTD Indicating Devices [1]	Pt 385, 100 Ω (-200 to -150) °C (-150 to 360) °C (360 to 740) °C (740 to 850) °C Pt 385, 1 000 Ω (-200 to 170) °C (170 to 470) °C (470 to 730) °C (730 to 850) °C	 0.045 °C 0.072 °C 0.14 °C 0.16 °C 0.047 °C 0.089 °C 0.14 °C 0.16 °C	Comparison to PIE 525B RTD and Thermocouple Calibrator

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Electrical Simulation of Thermocouple Indicating Devices [1]	Type J		Comparison to PIE 525B RTD and Thermocouple Calibrator
	(-200 to -150) °C	0.21 °C	
	(-150 to -50) °C	0.22 °C	
	(-50 to 300) °C	0.25 °C	
	(300 to 850) °C	0.3 °C	
	(850 to 1 200) °C	0.36 °C	
	Type K		
	(-230 to -100) °C	0.26 °C	
	(-100 to 600) °C	0.32 °C	
	(600 to 1 000) °C	0.35 °C	
	(1 000 to 1 371) °C	0.4 °C	
	Type R		
	(-18 to 250) °C	1.7 °C	
	(250 to 750) °C	1.8 °C	
	(750 to 1 600) °C	2 °C	
	(1 600 to 1 767) °C	2 °C	
	Type S		
	(-18 to 150) °C	1.7 °C	
	(150 to 500) °C	1.7 °C	
	(500 to 1 650) °C	1.9 °C	
	(1 650 to 1 767) °C	2 °C	
	Type T		
	(-260 to -240) °C	0.26 °C	
	(-240 to -210) °C	0.27 °C	
	(-210 to -100) °C	0.26 °C	
	(-100 to 50) °C	0.27 °C	
	(50 to 100) °C	0.32 °C	

Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Calipers [1]	Up to 6 in	300 µin	Direct measure using Gage Blocks
	(6 to 12) in	310 µin	
	(12 to 18) in	320 µin	
	(18 to 24) in	340 µin	
Depth Gauges [1]	Up to 2 in	33 µin	Direct measure using Gage Blocks
	(2 to 6) in	51 µin	
	(6 to 12) in	91 µin	

Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Dial and Test Indicators [1]	Up to 2 in (2 to 6) in (6 to 12) in	160 µin 160 µin 180 µin	Direct measure using Gage Blocks
Pin Gauges [1] (Diameter)	Up to 1 in	25 µin	Direct measure using Laser Micrometer
Laser Micrometers [1]	Up to 1 in	36 µin	Comparison to Master Pin Gauges
Height Gauges [1]	Up to 6 in (6 to 12) in (12 to 18) in (18 to 24) in	51 µin 91 µin 140 µin 180 µin	Direct measure using Gage Blocks
Length Bars [1]	(0.1 to 40) in	990 µin	Comparison to Standard Rule
Micrometers [1]	Up to 2 in (2 to 6) in (6 to 12) in	34 µin 51 µin 140 µin	Direct measure using Gage Blocks
Rules [1]	Up to 1 000 mm	12 µm	Comparison to Standard Rule
Rules [1]	Up to 40 in	990 µin	Comparison to Standard Rule
Thickness Gauges [1]	Up to 6 in (6 to 12) in (12 to 18) in (18 to 24) in	90 µin 81 µin 130 µin 170 µin	Direct measure using Gage Blocks

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Scales and Balances [1,2]	(0.001 to 120) g (120 to 200) g (220 to 5 000) g	2.2 mg 4 mg 90 mg	ASTM E617 Class 1 Weights and internal procedure CM-WHT01 utilized in the calibration of the weighing system.
Scales and Balances [1,2]	(1 to 50) lb (50 to 100) lb (100 to 300) lb (300 to 500) lb	0.005 8 lb 0.012 lb 0.035 lb 0.066 lb	NIST Class F Weights and internal procedure CM-WHT01 utilized in the calibration of the weighing system.

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Torque Measuring Devices [1]	Up to 90 lbf·in	0.58 lbf·in	Comparison to HIOS HP100 Digital Torque Meter
Pressure Devices [1]	Up to 15 psig (15 to 30) psig (30 to 100) psig (100 to 300) psig (300 to 500) psig (500 to 10 000) psig	0.018 psi 0.023 psi 0.072 psi 0.22 psi 0.36 psi 7.2 psi	Comparison to Master Pressure Gauges
Vacuum Devices [1]	(-15 to 0) psiv	0.053 psi	Comparison to Master Vacuum Gauges

Thermodynamic

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Temperature – Measure [1] (Temperature Indicating Devices)	(-100 to 200) °C	0.19 °C	Comparison to 4132 Platinum RTD Thermometer
Temperature – Measure [1] (Temperature Indicating Devices)	(200 to 500) °C (500 to 1 000) °C	2.4 °C 4.7 °C	Comparison to Type K Thermocouple Probe w/ Indicator
Relative Humidity – Measure [1]	(10 to 95) %RH	2.7 %RH	Direct Measure using Vaisala HM40/HMP113 Temperature and Humidity Meter

Time and Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
RPM Measure – Contact [1,3]	(0.5 to 500) rpm (500 to 1 000) rpm (1 000 to 2 000) rpm (2 000 to 3 000) rpm (3 000 to 4 000) rpm	0.42 rpm 0.96 rpm 2 rpm 2.7 rpm 3.1 rpm	Comparison to Extech 461995 Contact/Photo Tachometer

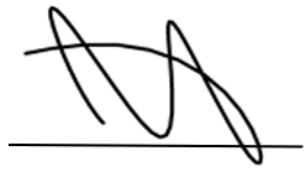
Time and Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
RPM Measure – Non-Contact [1,3]	(1 to 60) rpm (60 to 1 000) rpm (1 000 to 2 000) rpm (2 000 to 3 000) rpm (3 000 to 4 000) rpm (4 000 to 5 000) rpm (5 000 to 10 000) rpm (10 000 to 20 000) rpm (20 000 to 50 000) rpm (50 000 to 99 999) rpm	0.58 rpm 1.6 rpm 2.1 rpm 2.5 rpm 3.2 rpm 4.3 rpm 6.7 rpm 13 rpm 42 rpm 65 rpm	Comparison to Extech 461995 Contact/Photo Tachometer
Linear Distance Speed – Contact [1,3]	(5 to 50) ft/min (50 to 100) ft/min (100 to 200) ft/min (200 to 500) ft/min (500 to 1 000) ft/min (1 000 to 2 000) ft/min (2 000 to 3 000) ft/min (3 000 to 4 000) ft/min	0.74 ft/min 1.3 ft/min 2.5 ft/min 5.9 ft/min 12 ft/min 24 ft/min 35 ft/min 47 ft/min	Comparison to Extech 461995 Contact/Photo Tachometer
Timers and Stopwatches	60 s to 10 hr	0.42 s	Comparison to Control Company 1025 Digital Stopwatch

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 CMC for scales and balances is highly dependent upon the resolution of the unit under test. The CMC presented here does not include the resolution of the unit under test. The resolution will be included in the reported measurement uncertainty at the time of calibration.
3. rpm = revolutions per minute.
4. Unless otherwise specified in the far-right hand column, the calibration procedure being utilized by the laboratory was written internally.
5. This scope is formatted as part of a single document including Certificate of Accreditation No. AC-2671.



Jason Stine, Vice President