



CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

Kanawha Scales and Systems, Inc.

**243 West Alexander Road
Valley Grove, WV 26060**

Fulfills the requirements of

ISO/IEC 17025:2017

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 read 'R. Douglas Leonard Jr.', is positioned above a horizontal line.

R. Douglas Leonard Jr., VP, PILR SBU

Expiry Date: 27 March 2023

Certificate Number: L1166.08-1



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

Kanawha Scales and Systems, Inc.

243 West Alexander Road
 Valley Grove, WV 26060
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 304-464-5312

CALIBRATION

Valid to: **March 27, 2023**

Certificate Number: **L1166.08-1**

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
DC Current ¹ Source	(0 to 202) μ A (0.2 to 2.02) mA (2 to 20.2) mA (20 to 202) mA (0.2 to 2.02) A (2 to 30) A	0.013% of reading + 0.08 μ A 0.012% of reading + 0.000 27 mA 0.006 7% of reading + 0.002 5 mA 0.008 4% of reading + 0.025 mA 0.013% of reading + 0.000 26 A 0.05% of reading + 0.002 6 A	Transmille 3041A
AC Current ¹ Source	(0 to 202) μ A (10 to 44) Hz (45 to 999) Hz (1 to 10) kHz	0.29% of reading + 0.45 μ A 0.13% of reading + 0.45 μ A 1.8% of reading + 0.45 μ A	Transmille 3041A
	(0.2 to 2.02) mA (10 to 44) Hz (45 to 999) Hz (1 to 10) kHz	0.29% of reading + 0.000 9 mA 0.12% of reading + 0.000 69 mA 1% of reading + 0.001 2 mA	
	(2 to 20.2) mA (10 to 44) Hz (45 to 999) Hz (1 to 10) kHz	0.29% of reading + 0.01 mA 0.12% of reading + 0.008 7 mA 0.67% of reading + 0.015 mA	
	(20 to 202) mA (10 to 44) Hz (45 to 999) Hz (1 to 10) kHz	0.29% of reading + 0.1 mA 0.12% of reading + 0.087 mA 0.67% of reading + 0.15 mA	
	(0.2 to 2.02) A (10 to 44) Hz (45 to 999) Hz (1 to 10) kHz	0.29% of reading + 0.000 9 A 0.13% of reading + 0.000 69 A 0.84% of reading + 0.001 2 A	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Current ¹ Source	(2 to 30) A (30 to 44) Hz (45 to 99) Hz (100 to 1) kHz	0.25% of reading + 0.01 A 0.059% of reading + 0.006 2 A 0.42% of reading + 0.009 7 A	Transmille 3041A
DC Current ¹ Measure	300 μA 3 mA 30 mA 300 mA 1 A	240 nA 2 μA 20 μA 65 μA 2.1 mA	Hewlett Packard 3457A
AC Current ¹ Measure	(0 to 30) mA (10 to 44) Hz (45 to 999) Hz (1 to 10) kHz	31 μA 28 μA 21 μA	
	(30 to 300) mA (10 to 44) Hz (45 to 999) Hz (1 to 10) kHz	180 μA 270 μA 270 μA	
Resistance RTD Simulation 3 Wire Configuration ¹	(0.3 to 3) A (10 to 44) Hz (45 to 999) Hz (1 to 10) kHz	1.6 mA 20 mA 20 mA	Druck TRX-II; Electronic Calibration of Temperature Indicating Devices
	Pt 50 Pt 100 Pt 200 Pt 500 Pt 1 000 D 100 D 100 Ni 100 Ni 120 Cu 10	(-200 to 850) °C (-200 to 850) °C (-200 to 850) °C (-200 to 850) °C (-200 to 400) °C (-200 to 510) °C (510 to 645) °C (-60 to 250) °C (-80 to 260) °C (-200 to 850) °C	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Resistance RTD Simulation 4 Wire Configuration ¹ Pt 50 Pt 100 Pt 200 Pt 500 Pt 1 000 D 100 D 100 Ni 100 Ni 120 Cu 10	(-200 to 850) °C (-200 to 850) °C (-200 to 850) °C (-200 to 850) °C (-200 to 400) °C (-200 to 510) °C (510 to 645) °C (-60 to 250) °C (-80 to 260) °C (-200 to 850) °C	0.8 °C 0.7 °C 0.9 °C 0.8 °C 0.6 °C 0.7 °C 0.7 °C 0.6 °C 0.6 °C 2.4 °C	Druck TRX-II; Electronic Calibration of Temperature Indicating Devices
Resistance 2 Wire Configuration ¹ Source	0 Ω 0.1 Ω 1 Ω 10 Ω 100 Ω 1 kΩ 10 kΩ 100 kΩ 1 MΩ 10 MΩ 100 MΩ 1 000 MΩ	0.006 Ω 0.006 Ω 0.006 4 Ω 0.009 5 Ω 0.034 Ω 0.000 31 kΩ 0.003 1 kΩ 0.03 kΩ 0.000 4 MΩ 0.007 5 MΩ 0.71 MΩ 16 MΩ	Transmille 3041A
Resistance 4 Wire Configuration ¹ Measure	30 Ω 300 Ω 3 kΩ 30 kΩ 300 kΩ 3 MΩ 30 MΩ	640 uΩ 1.9 mΩ 10 mΩ 91 mΩ 1.2 Ω 30 Ω 610 Ω	Hewlett Packard 3457A
DC Voltage ¹ Source	(0 to 202) mV (0.2 to 2.02) V (2 to 20.2) V (20 to 202) V (200 to 1 025) V	0.003 6% of reading + 0.034 mV 0.003 6% of reading + 0.000 21 mV 0.003% of reading + 0.002 mV 0.003 6% of reading + 0.02 mV 0.003 6% of reading + 0.2 mV	Transmille 3041A

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
DC Voltage ¹ Measure	(0 to 30) mV (0 to 300) mV (0 to 3) V (0 to 30) V (0 to 300) V	10 μV 3.3 μV 52 μV 300 μV 21 mV	Hewlett Packard 3457A
Thermocouple Millivolt Simulation ¹	Type K (-270 to 1 370) °C Type J (-210 to 1 200) °C Type T (-270 to 400) °C Type B (50 to 1 820) °C Type R (-50 to 1 769) °C Type S (-50 to 1 769) °C Type E (-270 to 1 500) °C Type C (-150 to 2 320) °C Type D (0 to 2 495) °C	1.3 °C 0.7 °C 0.8 °C 2.5 °C 1.9 °C 1.6 °C 0.8 °C 1.3 °C 2.2 °C	Druck TRX-II; Electronic Calibration of Temperature Indicating Devices
AC Voltage Source ¹	(20.2 to 202) mV (10 to 45) Hz (45 to 1 000) Hz (1 to 20) kHz (20 to 100) kHz (100 to 500) kHz	0.28 % of reading + 0.074 mV 0.04 % of reading + 0.048 mV 0.11 % of reading + 0.057 mV 0.28 % of reading + 0.65 mV 0.86 % of reading + 0.76 mV	Transmille 3041A
	(0.202 to 2.02) V (10 to 45) Hz (45 to 1 000) Hz (1 to 20) kHz (20 to 100) kHz (100 to 500) kHz	0.28 % of reading + 0.59 mV 0.046 % of reading + 0.18 mV 0.089 % of reading + 0.35 mV 0.27 % of reading + 5.1 mV 0.6 % of reading + 6.3 mV	
	(2.02 to 20.2) V (10 to 45) Hz (45 to 1 000) Hz (1 to 20) kHz (20 to 100) kHz	0.29 % of reading + 4.4 mV 0.041 % of reading + 2.3 mV 0.073 % of reading + 3.7 mV 0.25 % of reading + 55 mV	
	(20.2 to 202) V (30 to 45) Hz (45 to 1 000) Hz (1 to 20) kHz	0.057 % of reading + 44 mV 0.043 % of reading + 21 mV 0.11 % of reading + 58 mV	
AC Voltage Source ¹	(202 to 1 020) V (30 to 45) Hz (45 to 1 000) Hz (1 to 10) kHz	0.06 % of reading + 310 mV 0.048 % of reading + 93 mV 0.19 % of reading + 480 mV	Transmille 3041A

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage Measure ¹	(0 to 30) mV (20 to 45) Hz (46 to 100) Hz (101 to 20) kHz	32 μ V 97 μ V 5.6 μ V	Hewlett Packard 3457A
	(0 to 300) mV (20 to 45) Hz (46 to 100) Hz (101 to 20) kHz	130 μ V 90 μ V 130 μ V	
	(0 to 3) V (20 to 45) Hz (46 to 100) Hz (101 to 20) kHz	11 mV 1.4 mV 1.6 mV	
	(0 to 30) V (20 to 45) Hz (46 to 100) Hz (101 to 20) kHz	14 mV 9.9 mV 14 mV	
	(0 to 300) V (20 to 45) Hz (46 to 100) Hz (101 to 20) kHz	120 mV 79 mV 120 mV	

Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Tape Measure ¹	(0 to 100) ft	0.149 in	Comparison with Standard Gage Blocks / Rule Standard
Steel Rules ¹	(0 to 72) in	0.011 in	
Length Standards	(0 to 18) in	260 μ in	Comparison with Length Standards & OD Micrometer
	(19 to 48) in	930 μ in	
	(49 to 70) in	0.001 43 in	
	(71 to 90) in	0.001 74 in	
Dial / Digital Indicator ¹	(0 to 2) in	150 μ in	Gage Blocks
Outside Micrometers ¹	(0 to 12) in (12 to 48) in	840 μ in 0.003 4 in	Gage Blocks

Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Inside Micrometers ¹	(0 to 1) in (2 to 48) in	129 μin 740 μin	Ring Gages
Depth Micrometers ¹	(0 to 12) in	880 μin	Depth Master
Calipers ¹	(0 to 12) in (12 to 48) in	500 μin 0.001 7 in	Gage Blocks
Height Gages ¹	(0 to 24) in (24 to 48) in	240 μin 0.001 2 in	Gage Blocks and Surface Plate

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Air Speed ¹	(30 to 4 000) fpm	12.1 fpm + 5% of Reading	Hot Wire Anemometer
Airflow ¹	(0 to 200) ft ³ /min	1.2 ft ³ /min + 5% of Reading	
Oven Air Exchanges ¹	(0 to 1) m ³ /min	0.055 m ³ /min	ASTM E145
Pressure/Vacuum Gages ¹	(0 to 65) psia	0.002 5 % rdg + 0.000 78 psi	ASME B40.100 Mensor CPC 6000 Fluke P3114-PSI
	(0 to 1 000) psi	0.002 1 % rdg + 0.003 8 psi	
	(200 to 10 000) psi	0.008 % rdg + 0.061 psi	
Torque Wrench ¹	(4 to 50) lbf·in	0.75 % of reading	CDI Torque Calibration System
	(30 to 400) lbf·in	0.75 % of reading	
	(80 to 1000) lbf·in	0.75 % of reading	
	(20 to 250) lbf·ft	0.75 % of reading	
	(60 to 600) lbf·ft	0.75 % of reading	
Class F Mass Standards (Test Weights)	500 mg	13 μg	Mass Comparison using Modified Substitution
	1 g	16 μg	
	2 g	30 μg	

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Class F Mass Standards (Test Weights)	3 g	42 µg	Mass Comparison using Modified Substitution
	5 g	42 µg	
	10 g	65 µg	
	20 g	66 µg	
	30 g	0.104 mg	
	50 g	0.145 mg	
	100 g	0.317 mg	
	200 g	0.432 mg	
	300 g	1.13 mg	
	500 g	1.11 mg	
	1 kg	10 mg	
	2 kg	14 mg	
	3 kg	16 mg	
	5 kg	91 mg	
	6 kg	92 mg	
	7 kg	94 mg	
	8 kg	95 mg	
	10 kg	96 mg	
	20 kg	121 mg	
	30 kg	151 mg	
0.5 lb	1.4 mg		
1 lb	1.7 mg		
2 lb	9.4 mg		

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Class F Mass Standards (Test Weights)	3 lb	9.6 mg	Mass Comparison using Modified Substitution
	4 lb	9.8 mg	
	5 lb	10.5 mg	
	10 lb	15.3 mg	
	15 lb	95.4 mg	
	20 lb	118.7 mg	
	25 lb	105 mg	
	30 lb	112 mg	
	50 lb	147 mg	
	10 000 lb	0.26 lb	
Weight Cart NIST HB 105-8 Table 1. Tolerances	10 000 lb	0.91 lb	
Weighing Systems ^{1,3} Class I, Unmarked and High Precision Lab Balances	(0.002 to 20) g (20.1 to 50 000) g	0.000 61 % of Applied Load 0.000 31 % of Applied Load	ASTM E617 Class 1 Weights and NIST Handbook 44 utilized for the calibration of the Weighing System
Class II, Unmarked and High Precision Balances & Scales ^{1,3}	(0.003 to 10) g (10.1 to 31 900) g	0.000 91 % of Applied Load 0.000 63 % of Applied Load	ASTM E617 Class 2 Weights and NIST Handbook 44 utilized for the calibration of the Weighing System
Class III, Unmarked and High Precision Balances & Scales ^{1,2,3}	(0.50 to 80.5) lb	0.005 % of Applied Load	ASTM E617 Class 4 Weights and NIST Handbook 44 utilized for the calibration of the Weighing System
Class III, Unmarked & Equivalent Industrial Scales ^{1,2,3}	(0.001 to 500 000) lb (0.000 5 to 1000) kg	0.01 % of Applied Load 0.01 % of Applied Load	NIST Class F and/or ASTM E617 Class 6 Weights and NIST Handbook 44 utilized for the calibration of the Weighing System

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Class III Vehicle and Hopper Scales ³	(500 to 30 000) lb (30 001 to 500 000) lb	0.017 % of Applied Load 0.038 % of Applied Load	NIST Class F and/or ASTM E617 Class 6 Weights and NIST Handbook 44 utilized for the calibration of the Weighing System

Thermodynamic

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Humidity Indicators ¹	(10 to 90) % RH	3% RH	Thermohygrometer
Temperature Measure ¹	(-77 to 550) °C	0.18 °C	SPRT Standards Venus Stirred Liquid Bath ASL Bath
Liquid in Glass Thermometers ¹	(0 to 140) °C	0.23 °C	Isotech TTI-7 Indicator SPRT Standards Venus Stirred Liquid Bath
Ovens, Furnaces, Freezers ¹	(0 to 250) °C	0.7 °C	ASTM E145

Time and Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Stopwatches	elapsed time up to 24 hours	0.07 sec	NIST WWVB signal
Oven Time Constant ¹	(0 to 1 200) sec	0.26 sec	ASTM E145
Frequency Sourcing	100 Hz 1 KHz 10 KHz 20 KHz 50 KHz 100 KHz	1 mHz 7 mHz 20 mHz 40 mHz 40 mHz 100 mHz	Transmille 3041A
Frequency Measure ¹	(10 to 400) Hz	5 mHz	Hewlett Packard 3457A
	400 Hz to 1.5 MHz	48 mHz	

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. Industrial Scales include but not limited to lab balances, bench and floor scales, tank and hopper scales and vehicle scales
3. The CMCs for balances and scales are highly dependent on the resolution of the unit under test. The CMCs presented here do not include the resolution of the unit under test. The resolution will be included in the reported uncertainty at the time of calibration.
4. Laboratory offers custom (specific scale) uncertainty budget when requested by client
5. This scope is formatted as part of a single document including Certificate of Accreditation No. L1166.08-1.



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