



CERTIFICATE OF ACCREDITATION

ANSI-ASQ National Accreditation Board

500 Montgomery Street, Suite 625, Alexandria, VA 22314, 877-344-3044

This is to certify that

**Kanawha Scales and Systems
Carnegie Branch
61A Weirton Street
Carnegie, PA 15106**

has been assessed by ANAB
and meets the requirements of international standard

ISO/IEC 17025:2005

while demonstrating technical competence in the fields of

CALIBRATION

Refer to the accompanying Scope of Accreditation for information regarding the types of calibrations and/or tests to which this accreditation applies.

L1166.09-1

Certificate Number


ANAB Approval

Certificate Valid: 03/15/2018-03/27/2019
Version No. 001 Issued: 03/15/2018



This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. 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 17025:2005

Kanawha Scales & Systems

Carnegie Branch
 61A Weirton Street
 Carnegie, PA 15106
 Gary Young
 412-279-6155

CALIBRATION

Valid to: **March 27, 2019**

Certificate Number: **L1166.09-1**

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	0.013% of reading + 0.08 μ A	Transmille 3041A
	(0.2 to 2.02) mA	0.012% of reading + 0.000 27 mA	
	(2 to 20.2) mA	0.006 7% of reading + 0.002 5 mA	
	(20 to 202) mA	0.008 4% of reading + 0.025 mA	
	(0.2 to 2.02) A (2 to 30) A	0.013% of reading + 0.000 26 A 0.05% of reading + 0.002 6 A	
AC Current ¹ Source	(0 to 202) μ A	0.29% of reading + 0.45 μ A	Transmille 3041A
	(10 to 44) Hz	0.13% of reading + 0.45 μ A	
	(45 to 999) Hz	1.8% of reading + 0.45 μ A	
	(1 to 10) kHz		
	(0.2 to 2.02) mA	0.29% of reading + 0.000 9 mA	
	(10 to 44) Hz	0.12% of reading + 0.000 69 mA	
	(45 to 999) Hz	1% of reading + 0.001 2 mA	
	(1 to 10) kHz		
(2 to 20.2) mA	0.29% of reading + 0.01 mA	Transmille 3041A	
(10 to 44) Hz	0.12% of reading + 0.008 7 mA		
(45 to 999) Hz	0.67% of reading + 0.015 mA		
(1 to 10) kHz			
(20 to 202) mA	0.29% of reading + 0.1 mA	Transmille 3041A	
(10 to 44) Hz	0.12% of reading + 0.087 mA		
(45 to 999) Hz	0.67% of reading + 0.15 mA		
(1 to 10) kHz			



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AC Current ¹ Source	(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	Transmille 3041A
	(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	
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	
	(0.3 to 3) A (10 to 44) Hz (45 to 999) Hz (1 to 10) kHz	1.6 mA 20 mA 20 mA	
Resistance RTD Simulation 3 Wire Configuration ¹			Druck TRX-II; Electronic Calibration of Temperature Indicating Devices
Pt 50	(-200 to 850) °C	1.1 °C	
Pt 100	(-200 to 850) °C	0.8 °C	
Pt 200	(-200 to 850) °C	1 °C	
Pt 500	(-200 to 850) °C	0.8 °C	
Pt 1 000	(-200 to 400) °C	0.7 °C	
D 100	(-200 to 510) °C	0.7 °C	
D 100	(510 to 645) °C	0.7 °C	
Ni 100	(-60 to 250) °C	0.7 °C	
Ni 120	(-80 to 260) °C	0.8 °C	
Cu 10	(-200 to 850) °C	2.4 °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



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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	



Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
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
AC Voltage Measure ¹	(0 to 30) mV (20 to 45) Hz (46 to 100) Hz (101 to 20) kHz	32 μV 97 μV 5.6 μV	Hewlett Packard 3457A
	(0 to 300) mV (20 to 45) Hz (46 to 100) Hz (101 to 20) kHz	130 μV 90 μV 130 μV	
	(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
Steel Rules ¹	(0 to 72) in	0.011 in	Gage Blocks / Rule Standard
Dial / Digital Indicator ¹	(0 to 2) in	150 μin	Gage Blocks
Outside Micrometers ¹	(0 to 12) in (12 to 48) in	840 μin 0.003 4 in	Gage Blocks
Inside Micrometers ¹	(0 to 1) in (2 to 48) in	129 μin 740 μin	Ring Gages



Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
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	
Weighing System ¹ (0.1 μg Resolution)	(0 to 2) g	1.7 μg	ASTM E617 Class 1 Weights and NIST Handbook 44 utilized for the calibration of the Weighing System
(1 μg Resolution)	(0 to 5) g	6 μg	
(0.01 mg Resolution)	(0 to 20) g	0.02 mg	
(0.1 mg Resolution)	(0 to 400) g	0.13 mg	
(1 mg Resolution)	(0 to 2 000) g	2 mg	ASTM E617 Class 2 Weights and NIST Handbook 44 utilized for the calibration of the Weighing System
(0.01 g Resolution)	(0 to 1 000) g	0.02 g	
(0.1 g Resolution)	(0 to 60 000) g	0.1 g	



Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Weighing System ¹ (1 g Resolution)	(0 to 120 000) g	1.25 g	ASTM E617 Class 4 Weights and NIST Handbook 44 utilized for the calibration of the Weighing System
(0.01 lb Resolution)	(0 to 300) lb	0.01 lb	NIST Handbook 105-1 Class F Weights and NIST Handbook 44 utilized for the calibration of the Weighing System
(0.1 lb Resolution)	(0 to 1 000) lb	0.12 lb	
(1 lb Resolution)	(0 to 30 000) lb	1.21 lb	
(10 lb Resolution)	(0 to 200 000) lb	12 lb	
(20 lb Resolution)	(0 to 400 000) lb	25 lb	
(100 lb Resolution)	(0 to 1 000 000) lb	123 lb	
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	

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. This scope is formatted as part of a single document including Certificate of Accreditation No. L1166.09-1.



Vice President