PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

Perry Johnson Laboratory Accreditation, Inc. has assessed the Laboratory of:

Wayac Scales & Calibration, Inc.

2899 Hilliard Rome Road, Hilliard, OH 43026

(Hereinafter called the Organization) and hereby declares that Organization 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
(as outlined by the joint ISO-ILAC-IAF Communiqué dated January 2009):

Dimensional, Mass, Force, Weighing, Time & Frequency, Mechanical, Thermodynamic, and Electrical Calibration

(As detailed in the supplement)

Accreditation claims for such testing and/or calibration services shall only be made from addresses referenced within this certificate. This Accreditation is granted subject to the system rules governing the Accreditation referred to above, and the Organization hereby covenants with the Accreditation body's duty to observe and comply with the said rules.

For PJLA:

Tracy Szerszen
President/Operations Manager

Perry Johnson Laboratory Accreditation, Inc. (PJLA)
755 W. Big Beaver, Suite 1325
Troy, Michigan 48084

Initial Accreditation Date:	*Issue Date:*	*Expiration Date:*
April 8, 2003	November 2, 2017	November 2, 2019

Accreditation No.:	*Certificate No.:*
59301	L17-478

The validity of this certificate is maintained through ongoing assessments based on a continuous accreditation cycle. The validity of this certificate should be confirmed through the PJLA website: www.pjlabs.com

Certificate of Accreditation: Supplement

Wayac Scales & Calibration, Inc.
2899 Hilliard Rome Road, Hilliard, OH 43026
Tim Jarrell Phone: 614-529-4556

Accreditation is granted to the facility to perform the following calibrations:

Dimensional

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Calipers [FO]	1.27 mm to 914.4 mm (0.05 in to 36 in)	(2.82 + .127L) µm [(111 + 5L) µin]	Gage Blocks Length Standards Ring Gage
Height Gages [FO]	1.27 mm to 914.4 mm (0.05 in to 36 in)	(11.3 + .0254L) µm [(445 + 1L) µin]	Gage Blocks Length Standards
Outside Micrometers [FO]	1.27 mm to 914.4 mm (0.05 in to 36 in)	(1.57+ .0762L) µm [(62 + 3L) µin]	Gage Blocks Length Standards
Depth Micrometers [FO]	1.27 mm to 457.2 mm (0.05 in to 12 in)	(1.78 + .152L) µm [(70 + 6L) µin]	Gage Blocks Length Standards
Inside Micrometers [FO]	1.27 mm to 914.4 mm (0.05 in to 36 in)	(1.14 + .102L) µm [(45 + 4L) µin]	Gage Blocks
Indicators [FO]	1.27 mm to 50.8 mm (0.05 in to 2 in)	(.763 + 153L) µm [(30 + 6L) µin]	Indicator Calibrator
Pin Gages [F]	0.279 4 mm to 25.4 mm (0.011 in to 1 in)	0.000 86 mm (0.000 034 in)	Super-Micrometer with Grade 1 Gage Blocks
Smooth Plug Gages [F]	0.279 4 mm to 127 mm (0.011 in to 5 in)	0.000 86 mm (0.000 034 in)	Super-Micrometer with Grade 1 Gage Blocks
Thread Plug Gages / Pitch Diameter [F]	1.0 x 0.2 to 127 x 10 (0-80 to 5-5 inches)	0.003 8 mm (0.001 5 in)	Super-Micrometer with Thread Wires
Smooth Ring Gages [F]	3.175 mm to 76.2 mm (0.012 5 in to 3 in)	0.000 48 mm (0.000 019 in)	Super-Micrometer with Grade 1 Gage Blocks
Rules & Tapes [FO] Error of Indication	9 144 mm maximum (360 in maximum)	0.39 mm (0.016 in)	Master Ruler Gage Blocks
Surface Plates [FO] Repeat Reading	0.000 26 mm to 0.508 mm (0.000 01 in to 0.02 in)	0.001 3 mm (0.000 05 in)	Repeat-O-Meter
Surface Plates [FO] Flatness	152.4 mm to 1 219.2 mm (6 in to 48 in)	0.000 76 mm (0.000 03 in)	Planekator Grade AA 24”
Protractors [FO]	Up to 90°	0.20°	Gage Blocks, Surface Plate and Sine Bar

Electrical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Equipment to Source DC Voltage [FO]	0.2 V to 2.00 V	0.003 % of reading + 7 µV	Transmille 3041A
	2.1 V to 20.0 V	0.002 5 % of reading + 480 µV	
	21 V to 200 V	0.003 % of reading + 4 300 µV	
	201 V to 1 000 V	0.003 % of reading + 4 800 µV	

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AC Voltage- Source [FO] at listed Frequences			Transmille 3041A
10 Hz to 44 Hz	20 mV to 202 mV	0.2 % of reading + 51 µV	
45 Hz to 999 Hz	20 mV to 202 mV	0.04 % of reading + 88 µV	
1 kHz to 19.999 kHz	20 mV to 202 mV	0.09 % of reading + 38 µV	
20 kHz to 99.999 kHz	20 mV to 202 mV	0.3 % of reading + 71 µV	
100 kHz to 500 kHz	20 mV to 202 mV	0.8 % of reading + 1 281 µV	
AC Voltage- Source [FO] at listed Frequences			
10 Hz to 44Hz	0.2 V to 2.02 V	0.2 % of reading + 363 µV	
45 Hz to 999 Hz	0.2 V to 2.02 V	0.04 % of reading + 152 µV	
1 kHz to 19.999 kHz	0.2 V to 2.02 V	0.09 % of reading + 194 µV	
20 kHz to 99.999 kHz	0.2 V to 2.02 V	0.25 % of reading + 2 303 µV	
100 kHz to 500 kHz	0.2 V to 2.02 V	0.45 % of reading + 4 032 µV	
AC Voltage- Source [FO] at listed Frequences			
10 Hz to 44 Hz	2 V to 20.2 V	0.2 % of reading + 7 000 µV	
45Hz to 999 Hz	2 V to 20.2 V	0.035 % of reading + 2 921 µV	
1 kHz to 19.999 kHz	2 V to 20.2 V	0.07 % of reading + 1 463 µV	
20 kHz to 100 kHz	2 V to 20.2 V	0.22 % of reading + 37 300 µV	
AC Voltage- Source [FO] at listed Frequences			Transmille 3041A
30 Hz to 44 Hz	20 V to 202 V	0.06 % of reading + 52 mV	
45 Hz to 999 Hz	20 V to 202 V	0.04 % of reading + 53 mV	
1 kHz to 20 kHz	20 V to 202 V	0.09 % of reading + 257 mV	
AC Voltage- Source [FO] at listed Frequences			
30 Hz to 45 Hz	200 V to 1 020 V	0.06 % of reading + 256 mV	
45 Hz to 999 Hz	200 V to 1020 V	0.04 % of reading + 163 mV	
1 kHz to 10 kHz	200 V to 1 020 V	0.15 % of reading + 472 mV	
DC Current - Source [FO]	20 µA to 202 µA	0.01 % of reading + 21 µA	
	0.2 mA to 2.02 mA	0.008 % of reading + 29 µA	
	2 mA to 20.2 mA	0.005 % of reading + 90 µA	
	20 mA to 202 mA	0.008 % of reading + 1 281 µA	
	0.2 A to 2.02 A	0.015 % of reading + 1 005 µA	
	2 A to 30 A	0.04 % of reading + 2 660 µA	

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AC Current – Source [FO] at the listed Frequency			Transmille 3041A
10 Hz to 44 Hz	20 µA to 202 µA	0.2 % of reading + 60 µA	
45 Hz to 999 Hz	20 µA to 202 µA	0.07 % of reading + 59 µA	
1 kHz to 10 kHz	20 µA to 202 µA	0.8 % of reading + 62 µA	
10 Hz to 44 Hz	0.2 mA to 2.02 mA	0.2 % of reading + 53 µA	
AC Current – Source [FO] at the listed Frequency			
45 Hz to 999 Hz	0.2 mA to 2.02 mA	0.06 % of reading + 33 µA	
1 kHz to 10kHz	0.2 mA to 2.02 mA	0.7 % of reading + 15 µA	
10 Hz to 44 Hz	2 mA to 20.2 mA	0.2 % of reading + 48 µA	
45 Hz to 999 Hz	2 mA to 20.2 mA	0.06 % of reading + 28 µA	
1 kHz to 10 kHz	2 mA to 20.2 mA	0.5 % of reading + 30 µA	
AC Current – Source [FO] at the listed Frequency			
10 Hz to 44 Hz	20 mA to 202 mA	0.2 % of reading + 510 µA	
45 Hz to 999 Hz	20 mA to 202 mA	0.06 % of reading + 330 µA	
1 kHz to 5 kHz	20 mA to 202 mA	0.6 % of reading + 1 250 µA	
AC Current – Source [FO] at the listed Frequency			
30 Hz to 44Hz	2 A to 30 A	0.2 % of reading + 62 400 µA	
45 Hz to 99 Hz	2 A to 30 A	0.09 % of reading + 31 900 µA	
100 Hz to 5 kHz	2 A to 30 A	0.3 % of reading + 4 000 µA	
Equipment to Source Resistance [FO]	0 to100 Ω	0.005 % of reading + 0.0052 Ω	Transmille 3041A
	100 Ω to 1 k Ω	0.004 % of reading + 0.0407 Ω	
	1 k Ω to 10 k Ω	0.004 % of reading + 0.407 Ω	
	10 k Ω to 100 k Ω	0.004 % of reading + 4.075 Ω	
	100 k Ω to 1 M Ω	0.01 % of reading + 121 Ω	
	1 M Ω to 10 M Ω	0.035 % of reading + 449 Ω	
	10 M Ω to 100 M Ω	0.5 % of reading + 6 850 Ω	
Frequency - Source [FO]	10 Hz to 500 kHz	0.4 % of reading	
DC Voltage Measure [FO]	100 mV to 1 000 V	0.014 % of reading	HP 34401A

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AC Voltage Measure at listed frequencies [FO]			HP 34401A
5 Hz to 10 Hz	10 mV to 100 mV	0.048 % of reading	
10 Hz to 20 kHz	10 mV to 100 mV	0.039 % of reading	
20 kHz to 50 kHz	10 mV to 100 mV	0.041 % of reading	
50 kHz to 100 kHz	10 mV to 100 mV	0.22 % of reading	
100 kHz to 300 kHz	10 mV to 100 mV	0.5 % of reading	
10 Hz	100 mV to 1 V	0.45 % of reading	
20 kHz	100 mV to 1 V	0.177 % of reading	
AC Voltage Measure at listed frequencies [FO]			HP 34401A
50 kHz	100 mV to 1 V	0.188 % of reading	
100 kHz	100 mV to 1 V	0.704 % of reading	
50 Hz	1 V to750 V	1.6 % of reading	
10 kHz	1 V to 750 V	1.54 % of reading	
DC Current - Measure [FO]	up to 10 mA	1.3 % of reading	
	10 mA to 100 mA	0.78 % of reading	
	100 mA to 1.0 A	0.174 % of reading	
	1.0 A to 3.0 A	0.93 % of reading	
AC Current – Measure [FO] at listed frequencies			
10 Hz	up to 1.0 A	0.81 % of reading	
5 kHz	up to 1.0 A	2.0 % of reading	
AC Current – Measure [FO] at listed frequencies			
10 Hz	1.0 A to 3.0 A	1.29 % of reading	
5 kHz	1.0 A to 3.0 A	2.38 % of reading	
Resistance - Measure [FO]	up to 100.0 Ω	1.74 % of reading	HP 34401A
	100.0 Ω to 1.0 k Ω	0.014 % of reading	
	1.0 k Ω to 10.0 k Ω	0.14 % of reading	
	10.0 k Ω to 100.0 k Ω	1.41 % of reading	
	100.0 k Ω to 1.0 M Ω	0.027 1 % of reading	
	1.0 M Ω to 10.0 M Ω	1.44 % of reading	
	10.0 M Ω to 100.0 M Ω	10.2 % of reading	

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Frequency – Measure at Listed Voltages [FO]			HP 34401A
100 mV	10 Hz	0.58 % of reading	
100 mV	40 Hz	2.3% of reading	
100 mV	300 kHz	0.43 % of reading	
Frequency – Measure at Listed Voltages [FO]			
750 V	50 Hz	3.1 % of reading	
750 V	10 kHz	16 % of reading	
Oscilloscope – Flatness Relative to 50 kHz signal [FO]	250 kHz to 100 MHz	1.0 %	Tektronix SG 503
	100 MHz to 250 MHz	3.0 %	
Oscilloscope – Time Marks Horizontal Calibration [FO]	5 s to 1 ns	(1×10^{-7}) s	Tektronix TG 501
Oscilloscope – Band Width Vertical Calibration [FO]	0.2 V to 2.00 V	0.003 % of reading + 7 µV	Transmille 3041A
	2.1 V to 20.0 V	0.002 5 % of reading + 480 µV	
	21 V to 200 V	0.003 % of reading + 4 300 µV	
	201 V to 1 000 V	0.003 % of reading + 4 800 µV	

Mass, Force, and Weigh Devices

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Weigh Balances [FO]	0.1 mg to 1 g	0.000 63g	Class 1 Weights
	1 g to 32 000 g		
Weigh Scales [FO]	226.796 g to 22 679.62 g (0.5 lb to 50 lb)	7.71g (0.017 lb)	F Class Weights
	45.36 g to 2 267.96 kg (100 lb to 5 000 lb)	1 723 g (3.8 lb)	
	2 721.55 kg to 18 143.69 kg (6 000 lb to 40 000 lb)	1 905 g (4.2 lb)	
	22 679.62 kg to 90 718.47 kg (50 000 lb to 200 000 lb)		
Tension Compression [FO]	2.22 N to 4 448.222 N (0.5 lb to 1 000 lb)	10.68 N (2.4 lb)	Indicator with NTEP Approved Load Cells
	222.41 kN to 44 482 22 kN (50 lb to 10 000 lb)	0.0862 kN (19.38 lb)	Indicator with NTEP Approved Load Cells

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Mechanical

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Indirect Verification of Rockwell Hardness Testers HRB[FO]	HRB	2 HRB	Certified Rockwell Test Blocks
	15 HRB to 31 HRB		
	31 HRB to 71 HRB		
	71 HRB to 100 HRB		
Electronic or Dial Pressure Gages, Commercial Grade, Medium Grade and Test Grade Transducers Stated values are gage pressure [FO]	3.1 kPa to 2 068.4 kPa (0.45 psi to 300 psi)	1.1 kPa (0.16 psi)	Druck DPI104-300
	2 075.32 kPa to 20 684.27 kPa (301 psi to 3 000 psi)	10.48 kPa (1.6 psi)	Druck DPI104-3000
	20 691.2 kPa to 68 947.6 kPa (3 001 to 10 000 psi)	38 kPa (5.5 psi)	Druck DPI104-10000
Magnahelics and Photohelics Gages[FO]	0.01 Pa to 249.088 Pa (0.13 in H_2O to 1 in H_2O)	3.74 Pa (0.015 in H_2O)	Manometers
	0.03 Pa to 996.356 Pa (0.135 in H_2O to 4 in H_2O)	11.21 Pa (0.045 in H_2O)	
Vacuum[FO]	-91.43 kPa to 0 kPa (-27 inHg to 0 inHg)	1.05 kPa (0.31 inHg)	Druck DPI104-300
Torque Wrenches, Torque Drivers[FO]	0.282 4 N·m to 2.824 N·m (40 ozf·in to 400 ozf·in)	0.026 N·m (3.7 ozf·in)	Torque Standards
	0.564 9 N·m to 5.649 N·m (5 lbf·in to 50 lbf·in)	0.19 N·m (1.7 lbf·in)	
	0.282 46 N·m to 28.246 N·m (25 lbf·in 250 lbf·in)	0.23 N·m (2.0 lbf·in)	
	11.298 5 N·m to 112.985 N·m (100 lbf·in to 1 000 lbf·in)	0.80 N·m (7.1 lbf·in)	
	81.349 1 N·m to 813.491 N·m (720 lbf·in to 7 200 lbf·in)	5.54 N·m (49 lbf·in)	
Durometers [FO] Direct Verification of Indentor Extension Types A, B, C, D, DO, O, OO	2.44 mm to 2.54 mm (0.096 in to 0.1 in)	0.0153 2 mm (0.000 603 in)	Gage Blocks
Durometers [FO] Indentor Spring Force Types A, B, C, D, DO, O, OO	0 kg to 4.53 kg	2.0 g	Electronic Force gage

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Thermodynamics

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Thermometers [FO]	33 °C to 300 °C (92 °F to 572 °F)	0.12 ° C (.22 ° F)	Fluke 2620A, Dry Block and PRT Omega CL-27 Omega BB703 Black Body
Digital Temperature [FO] Controllers	0 °C to 1 260 °C (32 °F to 2 300 °F)	0.34 °C (0.61 °F)	
Non-Contact Infrared Temperature Thermometers, Pyrometers [FO]	-6.6 °C to 400 °C (20.12 °F to 752 °F)	1.61 °C (2.9 °F)	
Relative Humidity [FO]	15% to 95% RH Non-condensing	4.9% RH	Psychrometer
Humidity Meters [FO]	5% and 95% RH	2% RH	Vaisala Salt Chamber
	20 °C	0.52 °C	PRT with Salts Chamber

Time and Frequency

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Digital/Mechanical Tachometer [FO]	40 rpm to 99 999 rpm	(1.18 + 0.003 % of reading) rpm	Tachometer
Stopwatches / Timers [FO]	60 s. to 24 hr	0.5 s	Universal Counter

1. The CMC (Calibration and Measurement Capability) stated for calibrations included on this scope of accreditation represents the smallest measurement uncertainty attainable by the laboratory when performing a more or less routine calibration of a nearly ideal device under nearly ideal conditions. It is typically expressed at a confidence level of 95 % using a coverage factor *k* (usually equal to 2). The actual measurement uncertainty associated with a specific calibration performed by the laboratory will typically be larger than the CMC for the same calibration since capability and performance of the device being calibrated and the conditions related to the calibration may reasonably be expected to deviate from ideal to some degree.

2. The laboratories range of calibration capability for all disciplines for which they are accredited is the interval from the smallest calibrated standard to the largest calibrated standard used in performing the calibration. The low end of this range must be an attainable value for which the laboratory has or has access to the standard referenced. Verification of an indicated value of zero in the absence of a standard is common practice in the procedure for many calibrations but by its definition it does not constitute calibration of zero capacity.

3. The presence of a superscript F means that the laboratory performs calibration of the indicated parameter at its Fixed location. Example: Outside Micrometer[F] would mean that the laboratory performs this calibration at its Fixed location.

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4. The presence of a superscript FO means that the laboratory performs calibration of the indicated parameter both at its Fixed location and Onsite at customer locations. Example: Outside Micrometer^{FO} would mean that the laboratory performs this calibration at its Fixed location and Onsite at customer locations.

5. Measurement uncertainties obtained for calibrations performed at customer sites can be expected to be larger than the measurement uncertainties obtained at the laboratories Fixed location for similar calibrations. This is due to the effects of transportation of the standards and equipment and upon environmental conditions at the customer site which are typically not controlled as closely as at the laboratories fixed location.

6. The term R represents radius in inches or millimeters as appropriate to the uncertainty statement.