PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

Quality Surveillance, Inc.

1200 Yarnell Place, Oxnard, CA 93033

(Hereinafter called the Organization) and hereby declares that Organization 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
(as outlined by the joint ISO-ILAC-IAF Communiqué dated April 2017):

Electrical, Time &Frequency, Dimensional, Thermodynamic and Mechanical 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

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

Initial Accreditation Date:	*Issue Date:*	*Expiration Date:*
June 25, 2002	March 01, 2024	April 30, 2026

Accreditation No:	*Certificate No.:*
59169	L24-174

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

Quality Surveillance, Inc.
1200 Yarnell Place, Oxnard, CA 93033
Contact Name: Steve Perez Phone: 805-240-2448

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

Electrical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Equipment to Output DC Voltage [FO]	10 mV to 100 mV	11 µV/V + 350 nV	HP 3458A	GIDEP
	100 mV to 1 V	10 µV/V + 380 nV		
	1 V to 10 V	10 µV/V + 0.6 µV		
	10 V to 100 V	12 µV/V + 35 µV		
	100 V to 1 000 V	12 µV/V + 120 µV		
Equipment to Output DC Resistance [FO]	1 Ω to 10 Ω	18.2 µΩ/Ω + 60 µΩ		
	10 Ω to 100 Ω	14.9 µΩ/Ω + 570 µΩ		
	100 Ω to 1 kΩ	13.2 µΩ/Ω + 500 µΩ		
	1 kΩ to 10 kΩ	13 µΩ/Ω + 6 mΩ		
	10 kΩ to 100 kΩ	13 µΩ/Ω + 60 mΩ		
	100 kΩ to 1 MΩ	18.3 µΩ/Ω + 2.3 Ω		
	1 MΩ to 10 MΩ	58.1 µΩ/Ω + 116 Ω		
	10 MΩ to 100 MΩ	578 µΩ/Ω + 1.16 kΩ		
	100 MΩ to 1 GΩ	5.8 mΩ/Ω + 11.6 kΩ		
Equipment to Output DC Current [FO]	10 µA to 100 µA	51 µA/A + 1.6 nA		
	100 µA to 1mA	51 µA/A + 10 nA		
	1 µA to 10 mA	51 µA/A + 100 nA		
	10 mA to 100 mA	81 µA/A + 1 µA		
	100 mA to 1 A	231 µA/A + 20 µA		
Equipment to Output AC Current (at the listed frequencies) [FO]				
10 Hz to 20 Hz	10 µA to 100 µA	4.7 mA/A + 34.7 nA		
20 Hz to 45 Hz	10 µA to 100 µA	1.8 mA/A + 34.7 nA		
45 Hz to 100 Hz	10 µA to 100 µA	693 µA/A + 34.7 nA		
100 Hz to 5 kHz	10 µA to 100 µA	693 µA/A + 34.7 nA		
Equipment to Output AC Current (at the listed frequencies) [FO]			HP 3458A	
10 Hz to 20 Hz	100 µA to 1 mA	4.7 mA/A + 231 nA		
20 Hz to 45 Hz	100 µA to 1 mA	1.8 mA/A + 231 nA		
45 Hz to 100 Hz	100 µA to 1 mA	693 µA/A + 231 nA		
100 Hz to 5 kHz	100 µA to 1 mA	347 µA/A + 231 nA		
5 kHz to 20 kHz	100 µA to 1 mA	693 µA/A + 231 nA		

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Equipment to Output AC Current (at the listed frequencies) FO			HP 3458A	GIDEP
20 kHz to 50 kHz	100 µA to 1 mA	4.7 mA/A + 462 nA		
50 kHz to 100 kHz	100 µA to 1 mA	6.4 mA/A + 1.8 µA		
Equipment to Output AC Current (at the listed frequencies) FO				
10 Hz to 20 Hz	1 mA to 10 mA	4.7 mA/A + 2.31 µA		
20 Hz to 45 Hz	1 mA to 10 mA	1.8 mA/A + 2.31 µA		
45 Hz to 100 Hz	1 mA to 10 mA	693 µA/A + 2.31 µA		
100 Hz to 5 kHz	1 mA to 10 mA	347 µA/A + 2.31 µA		
5 kHz to 20 kHz	1 mA to 10 mA	693 µA/A + 2.31 µA		
20 kHz to 50 kHz	1 mA to 10 mA	4.7 mA/A + 4.62 µA		
50 kHz to 100 kHz	1 mA to 10 mA	6.4 mA/A + 17.33 µA		
Equipment to Output AC Current (at the listed frequencies) FO				
10 Hz to 20 Hz	10 mA to 100 mA	4.7 mA/A + 23.1 µA		
20 Hz to 45 Hz	10 mA to 100 mA	1.8 mA/A + 23.1 µA		
45 Hz to 100 Hz	10 mA to 100 mA	693 µA/A + 23.1 µA		
100 Hz to 5 kHz	10 mA to 100 mA	347 µA/A + 23.1 µA		
5 kHz to 20 kHz	10 mA to 100 mA	693 µA/A + 23.1 µA		
20 kHz to 50 kHz	10 mA to 100 mA	4.7 mA/A + 46.2 µA		
50 kHz to 100 kHz	10 mA to 100 mA	6.4 mA/A + 173.3 µA		
Equipment to Output AC Current (at the listed frequencies) FO				
10 Hz to 20 Hz	100 mA to 1 A	4.7 mA/A + 231 µA		
20 Hz to 45 Hz	100 mA to 1 A	1.9 mA/A + 231 µA		
45 Hz to 100 Hz	100 mA to 1 A	924 µA/A + 231 µA		
100 Hz to 5 kHz	100 mA to 1 A	1.2 mA/A + 231 µA		
5 kHz to 20 kHz	100 mA to 1 A	3.5 mA/A + 231 µA		
20 kHz to 50 kHz	100 mA to 1 A	11.6 mA/A + 462 µA		
Equipment to Output AC Voltage (at the listed frequencies) FO				
1 Hz to 40 Hz	1 mV to 10 mV	347 µV/V + 3.47 µV		
40 Hz to 1 kHz	1 mV to 10 mV	231 µV/V + 1.27 µV		

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Equipment to Output AC Voltage (at the listed frequencies) FO			HP 3458A	GIDEP
1 kHz to 20 kHz	1 mV to 10 mV	347 µV/V + 1.27 µV		
20 kHz to 50 kHz	1 mV to 10 mV	1.2 mV/V + 1.27 µV		
50 kHz to 100 kHz	1 mV to 10 mV	5.8 mV/V + 1.27 µV		
100 kHz to 300 kHz	1 mV to 10 mV	46.2 mV/V + 2.31 µV		
Equipment to Output AC Voltage (at the listed frequencies) FO				
1 Hz to 40 Hz	10 mV to 100 mV	80.9 µV/V + 4.7 µV		
40 Hz to 1 kHz	10 mV to 100 mV	80.9 µV/V + 2.4 µV		
1 kHz to 20 kHz	10 mV to 100 mV	162 µV/V + 2.4 µV		
20 kHz to 50 kHz	10 mV to 100 mV	347 µV/V + 2.4 µV		
50 kHz to 100 kHz	10 mV to 100 mV	924 µV/V + 2.4 µV		
100 kHz to 300 kHz	10 mV to 100 mV	3.5 mV/V + 11.6 µV		
300 kHz to 1 MHz	10 mV to 100 mV	11.6 mV/V + 11.6 µV		
1 MHz to 2 MHz	10 mV to 100 mV	17.4 mV/V + 11.6 µV		
Equipment to Output AC Voltage (at the listed frequencies) FO				
1 Hz to 40 Hz	100 mV to 1 V	80.9 µV/V + 47 µV		
40 Hz to 1 kHz	100 mV to 1 V	80.9 µV/V + 24 µV		
1 kHz to 20 kHz	100 mV to 1 V	162 µV/V + 24 µV		
20 kHz to 50 kHz	100 mV to 1 V	347 µV/V + 24 µV		
50 kHz to 100 kHz	100 mV to 1 V	924 µV/V + 24 µV		
100 kHz to 300 kHz	100 mV to 1 V	3.5 mV/V + 116 µV		
300 kHz to 1 MHz	100 mV to 1 V	11.6 mV/V + 116 µV		
1 MHz to 2 MHz	100 mV to 1 V	17.4 mV/V + 116 µV		
Equipment to Output AC Voltage (at the listed frequencies) FO				
1 Hz to 40 Hz	1 V to 10 V	80.9 µV/V + 470 µV		
40 Hz to 1 kHz	1 V to 10 V	80.9 µV/V + 240 µV		
1 kHz to 20 kHz	1 V to 10 V	162 µV/V + 240 µV		
20 kHz to 50 kHz	1 V to 10 V	347 µV/V + 240 µV		
50 kHz to 100 kHz	1 V to 10 V	924 µV/V + 240 µV		

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Equipment to Output AC Voltage (at the listed frequencies) FO			HP 3458A	GIDEP
100 kHz to 300 kHz	1 V to 10 V	3.5 mV/V + 1.16 mV		
300 kHz to 1 MHz	1 V to 10 V	11.6 mV/V + 1.16 mV		
1 MHz to 2 MHz	1 V to 10 V	17.4 mV/V + 1.16 mV		
Equipment to Output AC Voltage (at the listed frequencies) FO				
1 Hz to 40 Hz	10 V to 100 V	231 µV/V + 4.7 mV		
40 Hz to 1 kHz	10 V to 100 V	231 µV/V + 2.4 mV		
1 kHz to 20 kHz	10 V to 100 V	231 µV/V + 2.4 mV		
20 kHz to 50 kHz	10 V to 100 V	405 µV/V + 2.4 mV		
50 kHz to 100 kHz	10 V to 100 V	1.4 mV/V + 2.4 mV		
100 kHz to 300 kHz	10 V to 100 V	4.7 mV/V + 11.6 mV		
300 kHz to 1 MHz	10 V to 100 V	17.4 mV/V + 11.6 mV		
Equipment to Output AC Voltage (at the listed frequencies) FO				
1 Hz to 40 Hz	100 V to 700 V	465 µV/V + 33 mV		
40 Hz to 1 kHz	100 V to 700 V	465 µV/V + 33 mV		
1 kHz to 20 kHz	100 V to 700 V	696 µV/V + 33 mV		
20 kHz to 50 kHz	100 V to 700 V	1.4 mV/V + 33 mV		
50 kHz to 100 kHz	100 V to 700 V	3.5 mV/V + 33 mV		
Equipment to Measure Capacitance FO At the listed frequencies (50 Hz to 1 kHz)	330 pF to 11 nF	5.8 pF/nF + 11.6 pF	Fluke 5500A	GIDEP
	11 nF to 110 nF	2.9 pF/nF + 115.6 pF		
	110 nF to 330 nF	2.9 pF/nF + 346.5 pF		
	330 nF to 1.1 µF	2.9 nF/µF + 1.2 nF		
	1.1 µF to 3.3 µF	4.1 nF/µF + 3.5 nF		
	3.3 µF to 11 µF	4.1 nF/µF +11.6 nF		
	11 µF to 33 µF	4.7 nF/µF + 34.7 nF		
	33 µF to 110 µF	5.8 nF/µF + 115.6 nF		
	110 µF to 330 µF	8.1 nF/µF + 346.5 nF		
	330 µF to 1.1 mF	11.6 µF/mF + 347 nF		

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Thermodynamic

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
RH Meters/Recorders Fixed Points [FO]	75.3 % RH	1 % RH at 25 °C	Salt Solutions - Sodium Chloride	GIDEP
	75.5 % RH	1 % RH at 20 °C		
	32.8 % RH	1 % RH at 25 °C	Salt Solutions – Magnesium Chloride	GIDEP
	33.1 % RH	1 % RH at 20 °C		

Dimensional

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Gage Block [F]	0.1 in to 0.95 in	(3 + 1.3L) µin	Federal 130B-16	GIDEP
	1 in to 4 in	(2.8 + 2L) µin		
Outside Micrometer [FO]	0.1 in to 4 in	(38 + 5L) µin	Gage Blocks	GIDEP
	5 in to 20 in	(28 + 8L) µin		
	21 in to 40 in	(539 + 3L) µin		
Depth Micrometer [FO]	0.1 in to 6 in	(53 + 5L) µin		
	7 in to 12 in	(40 + 6L) µin		
Drop Indicator [FO]	0.000 5 in to 2 in	(72 + 11L) µin		
Micrometer Head [FO]	0.1 in to 2 in	(47 + 9L) µin		
Test Indicator [FO]	0.000 5 in to 0.008 in	(58 + 0.7L) µin		
Height Gage [FO]	0.1 in to 40 in	(301 + 4L) µin		
Caliper [FO]	0.1 in to 40 in	(295 + 8L) µin		
Height Master [F]	1 in to 12 in	(84 + 2L) µin		
	12 in to 24 in	(62 + 4L) µin		
Super Micrometer [F]	0.1 in to 1 in	37 µin		
Cylindrical Plug/Pin [FO]	0.01 in to 1 in	52 µin	Mahr 828	GIDEP

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

Mechanical

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Pressure Gauge [FO]	-30 inHg to 0 inHg	0.018 inHg	Ruska 6220-05A	GIDEP
	Up to 15 psi	0.012 psi		
	15 psi to 30 psi	0.045 psi	Ametek RK-300	GIDEP
	30 psi to 60 psi	0.066 psi		
	60 psi to 150 psi	0.12 psi		
	150 psi to 300 psi	0.29 psi		
	300 psi to 1 500 psi	1.2 psi	Heise HQS-2/FM -	GIDEP
	1 500 psi to 5 000 psi	5.7 psi	Heise 901B	GIDEP
	5 000 psi to 10 000 psi	29 psi	Seegars SS-2170-1000	GIDEP
Torque Wrench/Driver [FO]	2.5 ozf·in to 25 ozf·in	0.6 ozf·in	Sturtevant-Richmont System 5 TT25I0	
	25 ozf·in to 80 ozf·in	1.5 ozf·in	Sturtevant-Richmont System 5 TT-100I0 GIDEP	GIDEP
	80 ozf·in to 160 ozf·in	3 ozf·in	Sturtevant-Richmont System 5 T400I0	GIDEP
	10 lbf·in to 25 lbf·in	0.35 lbf·in	Sturtevant-Richmont System 5 TT100I	GIDEP
	25 lbf·in to 50 lbf·in	0.62 lbf·in		
	50 lbf·in to 100 lbf·in	1.5 lbf·in		
	100 lbf·in to 300 lbf·in	3.1 lbf·in	Sturtevant-Richmont System 5 TT300I	GIDEP
	300 lbf·in to 600 lbf·in	8.1 lbf·in		
	600 lbf·ft to 1 800 lbf·ft	16 lbf·ft	Sturtevant-Richmont System 5 TT-150	GIDEP
	150 lbf·ft to 250 lbf·ft	3 lbf·ft	Sturtevant-Richmont System 5 TT-250	GIDEP
Torque Wrench[FO]	250 lbf·ft to 600 lbf·ft	3.9 lbf·ft	Sturtevant-Richmont System 5 TT-1000	GIDEP
	600 lbf·ft to 1 000 lbf·ft	6.7 lbf·ft		

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Torque Analyzer-[FO]	5 in·lbs to 50 in·lbs	(0.11 + 0.001 6 T) in·lbs	Class F weights/Torque Arms	GIDEP
	180 in·lbs to 1 800 in·lbs	(3.9 + 0.001 6 T) in·lbs		
	300 in·lbs to 3 000 in·lbs	(6.5 + 0.001 6 T) in·lbs		
	3 000 in·lbs to 12 000 in·lbs	(25.8 + 0.001 6 T) in·lbs		
Rockwell Hardness Tester [O]	(10 to 30) HRC	1.6 HRC	HRC, HR15N	GIDEP
	(60 to 70) HRC	1.6 HRC		
	(70 to 77) HR15N	2.1 HR15N		
	(89 to 94) HR15N	2.2 HR15N		
	(63 to 77) HR45N	2.2 HR45N		
Accelerometer [F] 1G @ 20 Hz to 10 000 Hz	20 Hz to 100 Hz	3.80 %	Reference Accelerometer/Vibration Controller	GIDEP
	100 Hz to 2 500 Hz	3.1 %		
	2 500 Hz to 10 kHz	5.3 %		

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.

4. The presence of a superscript O means that the laboratory performs calibration of the indicated parameter 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 L represents length in inches or millimeters as appropriate to the uncertainty statement.