



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):

Calibration of Electrical, Frequency, Dimensional, Thermodynamic and Mechanical Devices
(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:

June 25, 2002

Revision Date:

January 18, 2021

Issue Date:

November 20, 2019

Accreditation No.:

59169

Expiration Date:

November 20, 2021

Certificate No.:

L19-590-R1

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.pjilabs.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 (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Equipment to Output DC Voltage ^{FO}	10 mV to 100 mV	11 μ V/V + 350 nV	HP 3458A GIDEP
	100 mV to 1 V	10 μ V/V + 380 nV	
	1 V to 10 V	10 μ V/V + 0.6 μ V	
	10 V to 100 V	12 μ V/V + 35 μ V	
	100 V to 1 000 V	12 μ V/V + 120 μ V	
Equipment to Output DC Resistance ^{FO}	1 Ω to 10 Ω	18.2 $\mu\Omega/\Omega$ + 60 $\mu\Omega$	
	10 Ω to 100 Ω	14.9 $\mu\Omega/\Omega$ + 570 $\mu\Omega$	
	100 Ω to 1 k Ω	13.2 $\mu\Omega/\Omega$ + 500 $\mu\Omega$	
	1 k Ω to 10 k Ω	13 $\mu\Omega/\Omega$ + 6 m Ω	
	10 k Ω to 100 k Ω	13 $\mu\Omega/\Omega$ + 60 m Ω	
	100 k Ω to 1 M Ω	18.3 $\mu\Omega/\Omega$ + 2.3 Ω	
	1 M Ω to 10 M Ω	58.1 $\mu\Omega/\Omega$ + 116 Ω	
	10 M Ω to 100 M Ω	578 $\mu\Omega/\Omega$ + 1.16 k Ω	
100 M Ω to 1 G Ω	5.8 m Ω/Ω + 11.6 k Ω		
Equipment to Output DC Current ^{FO}	10 μ A to 100 μ A	51 μ A/A + 1.6 nA	
	100 μ A to 1mA	51 μ A/A + 10 nA	
	1 μ A to 10 mA	51 μ A/A + 100 nA	
	10 mA to 100 mA	81 μ A/A + 1 μ A	
	100 mA to 1 A	231 μ A/A + 20 μ A	
Equipment to Output AC Current (at the listed frequencies) ^{FO}			
10 Hz to 20 Hz	10 μ A to 100 μ A	4.7 mA/A + 34.7 nA	
20 Hz to 45 Hz	10 μ A to 100 μ A	1.8 mA/A + 34.7 nA	
45 Hz to 100 Hz	10 μ A to 100 μ A	693 μ A/A + 34.7 nA	
100 Hz to 5 kHz	10 μ A to 100 μ A	693 μ A/A + 34.7 nA	



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 (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Equipment to Output AC Current (at the listed frequencies) ^{FO}			HP 3458A GIDEP
10 Hz to 20 Hz	100 μ A to 1 mA	4.7 mA/A + 231 nA	
20 Hz to 45 Hz	100 μ A to 1 mA	1.8 mA/A + 231 nA	
45 Hz to 100 Hz	100 μ A to 1 mA	693 μ A/A + 231 nA	
100 Hz to 5 kHz	100 μ A to 1 mA	347 μ A/A + 231 nA	
5 kHz to 20 kHz	100 μ A to 1 mA	693 μ A/A + 231 nA	
Equipment to Output AC Current (at the listed frequencies) ^{FO}			
20 kHz to 50 kHz	100 μ A to 1 mA	4.7 mA/A + 462 nA	
50 kHz to 100 kHz	100 μ A to 1 mA	6.4 mA/A + 1.8 μ A	
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 μ A	
20 Hz to 45 Hz	1 mA to 10 mA	1.8 mA/A + 2.31 μ A	
45 Hz to 100 Hz	1 mA to 10 mA	693 μ A/A + 2.31 μ A	
100 Hz to 5 kHz	1 mA to 10 mA	347 μ A/A + 2.31 μ A	
5 kHz to 20 kHz	1 mA to 10 mA	693 μ A/A + 2.31 μ A	
20 kHz to 50 kHz	1 mA to 10 mA	4.7 mA/A + 4.62 μ A	
50 kHz to 100 kHz	1 mA to 10 mA	6.4 mA/A + 17.33 μ A	
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 μ A	
20 Hz to 45 Hz	10 mA to 100 mA	1.8 mA/A + 23.1 μ A	
45 Hz to 100 Hz	10 mA to 100 mA	693 μ A/A + 23.1 μ A	
100 Hz to 5 kHz	10 mA to 100 mA	347 μ A/A + 23.1 μ A	
5 kHz to 20 kHz	10 mA to 100 mA	693 μ A/A + 23.1 μ A	
20 kHz to 50 kHz	10 mA to 100 mA	4.7 mA/A + 46.2 μ A	
50 kHz to 100 kHz	10 mA to 100 mA	6.4 mA/A + 173.3 μ A	



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 (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Equipment to Output AC Current (at the listed frequencies) ^{FO}			HP 3458A GIDEP
10 Hz to 20 Hz	100 mA to 1 A	4.7 mA/A + 231 μ A	
20 Hz to 45 Hz	100 mA to 1 A	1.9 mA/A + 231 μ A	
45 Hz to 100 Hz	100 mA to 1 A	924 μ A/A + 231 μ A	
100 Hz to 5 kHz	100 mA to 1 A	1.2 mA/A + 231 μ A	
5 kHz to 20 kHz	100 mA to 1 A	3.5 mA/A + 231 μ A	
20 kHz to 50 kHz	100 mA to 1 A	11.6 mA/A + 462 μ A	
Equipment to Output AC Voltage (at the listed frequencies) ^{FO}			
1 Hz to 40 Hz	1 mV to 10 mV	347 μ V/V + 3.47 μ V	
40 Hz to 1 kHz	1 mV to 10 mV	231 μ V/V + 1.27 μ V	
Equipment to Output AC Voltage (at the listed frequencies) ^{FO}			
1 kHz to 20 kHz	1 mV to 10 mV	347 μ V/V + 1.27 μ V	
20 kHz to 50 kHz	1 mV to 10 mV	1.2 mV/V + 1.27 μ V	
50 kHz to 100 kHz	1 mV to 10 mV	5.8 mV/V + 1.27 μ V	
100 kHz to 300 kHz	1 mV to 10 mV	46.2 mV/V + 2.31 μ V	
Equipment to Output AC Voltage (at the listed frequencies) ^{FO}			
1 Hz to 40 Hz	10 mV to 100 mV	80.9 μ V/V + 4.7 μ V	
40 Hz to 1 kHz	10 mV to 100 mV	80.9 μ V/V + 2.4 μ V	
1 kHz to 20 kHz	10 mV to 100 mV	162 μ V/V + 2.4 μ V	
20 kHz to 50 kHz	10 mV to 100 mV	347 μ V/V + 2.4 μ V	
50 kHz to 100 kHz	10 mV to 100 mV	924 μ V/V + 2.4 μ V	
100 kHz to 300 kHz	10 mV to 100 mV	3.5 mV/V + 11.6 μ V	
300 kHz to 1 MHz	10 mV to 100 mV	11.6 mV/V + 11.6 μ V	
1 MHz to 2 MHz	10 mV to 100 mV	17.4 mV/V + 11.6 μ V	



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 (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Equipment to Output AC Voltage (at the listed frequencies) ^{FO}			HP 3458A GIDEP
1 Hz to 40 Hz	100 mV to 1 V	80.9 μ V/V + 47 μ V	
40 Hz to 1 kHz	100 mV to 1 V	80.9 μ V/V + 24 μ V	
1 kHz to 20 kHz	100 mV to 1 V	162 μ V/V + 24 μ V	
20 kHz to 50 kHz	100 mV to 1 V	347 μ V/V + 24 μ V	
50 kHz to 100 kHz	100 mV to 1 V	924 μ V/V + 24 μ V	
100 kHz to 300 kHz	100 mV to 1 V	3.5 mV/V + 116 μ V	
300 kHz to 1 MHz	100 mV to 1 V	11.6 mV/V + 116 μ V	
1 MHz to 2 MHz	100 mV to 1 V	17.4 mV/V + 116 μ V	
Equipment to Output AC Voltage (at the listed frequencies) ^{FO}			
1 Hz to 40 Hz	1 V to 10 V	80.9 μ V/V + 470 μ V	
40 Hz to 1 kHz	1 V to 10 V	80.9 μ V/V + 240 μ V	
1 kHz to 20 kHz	1 V to 10 V	162 μ V/V + 240 μ V	
20 kHz to 50 kHz	1 V to 10 V	347 μ V/V + 240 μ V	
50 kHz to 100 kHz	1 V to 10 V	924 μ V/V + 240 μ V	
Equipment to Output AC Voltage (at the listed frequencies) ^{FO}			
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 μ V/V + 4.7 mV	
40 Hz to 1 kHz	10 V to 100 V	231 μ V/V + 2.4 mV	
1 kHz to 20 kHz	10 V to 100 V	231 μ V/V + 2.4 mV	
20 kHz to 50 kHz	10 V to 100 V	405 μ V/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	



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 (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Equipment to Output AC Voltage (at the listed frequencies) ^{FO}			HP 3458A GIDEP
1 Hz to 40 Hz	100 V to 700 V	465 μ V/V + 33 mV	
40 Hz to 1 kHz	100 V to 700 V	465 μ V/V + 33 mV	
1 kHz to 20 kHz	100 V to 700 V	696 μ V/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 DC Resistance Fixed Points ^{FO}	1 Ω	26 $\mu\Omega$	L&N 4020 GIDEP
	1 k Ω	12 m Ω	L&N 4035 GIDEP
	1 M Ω	24 Ω	L&N 4050 GIDEP
Equipment to Output Inductance ^{FO} At the listed frequency 120 Hz	100 μ H to 1 000 μ H	2.3 mH/H + 3 μ H	HP 4262A GIDEP
	1 mH to 10 mH	2.3 mH/H + 30 μ H	
	10 mH to 100 mH	2.3 mH/H + 300 μ H	
	100 mH to 1 000 mH	2.3 mH/H + 3 mH	
	1 H to 10 H	2.3 mH/H + 30 mH	
	10 H to 100 H	11.6 mH/H + 300 mH	
	100 H to 1 000 H	11.6 mH/H + 3 H	
Equipment to Output Inductance ^{FO} At the listed frequency 1 kHz	10 μ H to 100 μ H	2.3 mH/H + 300 nH	
	100 μ H to 1 000 μ H	2.3 mH/H + 3 μ H	
	1 mH to 10 mH	2.3 mH/H + 30 μ H	
	10 mH to 100 mH	2.3 mH/H + 300 μ H	
	100 mH to 1 000 mH	2.3 mH/H + 3 mH	
	1 H to 10 H	11.6 mH/H + 30 mH	
	10 H to 100 H	11.6 mH/H + 300 mH	
Equipment to Output Inductance ^{FO} At the listed frequency 10 kHz	1 mH to 10 mH	3.5 mH/H + 30 nH	
	10 μ H to 100 μ H	2.3 mH/H + 300 nH	
	100 μ H to 1 000 μ H	2.3 mH/H + 3 μ H	
	1 mH to 10 mH	2.3 mH/H + 30 μ H	
	10 mH to 100 mH	2.3 mH/H + 300 μ H	
	100 mH to 1 000 mH	11.6 mH/H + 3 mH	
	1 H to 10 H	585 mH/H + 30 mH	



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 (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Equipment to Output Capacitance ^{FO} At the listed frequency 120 Hz	100 pF to 1 000 pF	2.3 mF/F + 2 pF	HP 4262A GIDEP
	1 nF to 10 nF	2.3 mF/F + 20 pF	
	10 nF to 100 nF	2.3 mF/F + 200 pF	
	100 nF to 1 000 nF	2.3 mF/F + 2 nF	
	1 μ F to 10 μ F	2.3 mF/F + 20 nF	
	10 μ F to 100 μ F	3.5 mF/F + 300 nF	
	100 μ F to 1 000 μ F	5.8 mF/F + 3 μ F	
	1 mF to 10 mF	11.6 mF/F + 30 μ F	
Equipment to Output Capacitance ^{FO} At the listed frequency 1 kHz	10 pF to 100 pF	2.3 mF/F + 0.2 pF	HP 4262A GIDEP
	100 pF to 1 000 pF	2.3 mF/F + 2 pF	
	1 nF to 10 nF	2.3 mF/F + 20 pF	
	10 nF to 100 nF	2.3 mF/F + 200 pF	
	100 nF to 1 000 nF	2.3 mF/F + 2 nF	
	1 μ F to 10 μ F	2.3 mF/F + 20 nF	
	10 μ F to 100 μ F	3.5 mF/F + 300 nF	
	100 μ F to 1 000 μ F	5.8 mF/F + 3 μ F	
Equipment to Output Capacitance ^{FO} At the listed frequency 10 kHz	1 pF to 10 pF	5.8 mF/F + 0.04 pF	HP 4262A GIDEP
	10 pF to 100 pF	2.3 mF/F + 0.2 pF	
	100 pF to 1 000 pF	2.3 mF/F + 2 pF	
	1 nF to 10 nF	2.3 mF/F + 20 pF	
	10 nF to 100 nF	2.3 mF/F + 200 pF	
	100 nF to 1 000 nF	3.5 mF/F + 3 nF	
	1 μ F to 10 μ F	11.6 mF/F + 30 nF	
	10 μ F to 100 μ F	57.8 mF/F + 300 nF	
Equipment to Measure Capacitance ^{FO} At the listed frequency 1 kHz	100 pF to 1.111 μ F in steps of 100 pF	0.72 pF/nF + 0.07 pF	General Radio 1423-A GIDEP



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 (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
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 μ F	2.9 nF/ μ F + 1.2 nF	
	1.1 μ F to 3.3 μ F	4.1 nF/ μ F + 3.5 nF	
	3.3 μ F to 11 μ F	4.1 nF/ μ F + 11.6 nF	
	11 μ F to 33 μ F	4.7 nF/ μ F + 34.7 nF	
	33 μ F to 110 μ F	5.8 nF/ μ F + 115.6 nF	
	110 μ F to 330 μ F	8.1 nF/ μ F + 346.5 nF	
330 μ F to 1.1 mF	11.6 μ F/mF + 347 nF		
Equipment to Measure Amplitude / Sine Wave (at the listed frequencies) ^{FO}			HP 3325B GIDEP
0.1 Hz to 100 kHz	13.52 dB to 23.98 dB	0.1 dB	
100 kHz to 21 MHz	13.52 dB to 23.98 dB	0.4 dB	
Equipment to Measure Amplitude / Sine Wave (at the listed frequencies) ^{FO}			
0.1 Hz to 100 kHz	-16.02 dB to 13.52 dB	0.2 dB	
100 kHz to 21 MHz	-16.02 dB to 13.52 dB	0.6 dB	
Equipment to Measure Amplitude / Sine Wave (at the listed frequencies) ^{FO}			
0.1 Hz to 100 kHz	-56.02 dB to -16.02 dB	0.2 dB	
100 kHz to 10 MHz	-56.02 dB to -16.02 dB	0.6 dB	
10 MHz to 21 MHz	-56.02 dB to -16.02 dB	0.9 dB	
Equipment to Measure Amplitude / Sine Wave (at the listed frequencies) ^{FO}			HP 8657A GIDEP
100 kHz to 1 040 MHz	-127 dB to 7 dB	1 dB	
Equipment to Measure Amplitude / Sine Wave (at the listed frequencies) ^{FO}			
100 kHz to 1 MHz	7 dB to 10 dB	1.5 dB	
Equipment to Measure Amplitude / Sine Wave (at the listed frequencies) ^{FO}			
1 MHz to 1 040 MHz	7 dB to 13 dB	1.5 dB	



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 (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Equipment to Measure Amplitude / Sine Wave (at the listed frequencies) ^{FO}			HP 8340B GIDEP
2.3 GHz to 20 GHz	18 dB to 10 dB	1.8 dB	
20 GHz to 26.5 GHz	18 dB to 10 dB	2.3 dB	
Equipment to Measure Amplitude / Sine Wave (at the listed frequencies) ^{FO}			
10 MHz to 2.3 GHz	10 dB to -9.95 dB	0.9 dB	
2.3 GHz to 20 GHz	10 dB to -9.95 dB	1.5 dB	
20 GHz to 26.5 GHz	10 dB to -9.95 dB	2 dB	
Equipment to Measure Amplitude / Sine Wave (at the listed frequencies) ^{FO}			HP 8340B GIDEP
10 MHz to 2.3 GHz	-10 dB to -19.95 dB	1.2 dB	
2.3 GHz to 20 GHz	-10 dB to -19.95 dB	2 dB	
20 GHz to 26.5 GHz	-10 dB to -19.95 dB	2.5 dB	
Equipment to Measure Amplitude / Sine Wave (at the listed frequencies) ^{FO}			
10 MHz to 2.3 GHz	- 20 dB to - 49.95 dB	1.5 dB	
2.3 GHz to 20 GHz	- 20 dB to - 49.95 dB	2.3 dB	
20 GHz to 26.5 GHz	- 20 dB to - 49.95 dB	2.8 dB	
Equipment to Measure Amplitude / Sine Wave (at the listed frequencies) ^{FO}			HP 8340B GIDEP
10 MHz to 2.3 GHz	- 50 dB to - 79.95 dB	1.8 dB	
2.3 GHz to 20 GHz	- 50 dB to - 79.95 dB	2.6 dB	
20 GHz to 26.5 GHz	- 50 dB to - 79.95 dB	3.1 dB	
Equipment to Measure Amplitude / Sine Wave (at the listed frequencies) ^{FO}			
10 MHz to 2.3 GHz	- 80 dB to -100 dB	2.1 dB	
2.3 GHz to 20 GHz	- 80 dB to -100 dB	2.9 dB	
20 GHz to 26.5 GHz	- 80 dB to -100 dB	3.4 dB	
Oscilloscope – Amplitude ^{FO}	V _{pp} = 5 mV to 5.5 V	X1: 3 % of reference output X0.1: 4 % of reference output X0.01: 5 % of reference output	Tektronix SG503 GIDEP
Oscilloscope - Amplitude Flatness ^{FO}	250 kHz to 100 MHz	1 % of the reference frequency amplitude	
	100 MHz to 250 MHz	3 % of the reference frequency amplitude	



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 (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Oscilloscope – Amplitude ^{FO}	V _{pp} = 0.5 V to 4 V	3 % of reference output	Tektronix SG504 GIDEP
Oscilloscope - Amplitude Flatness ^{FO}	250 MHz to 1 050 MHz	4 % of the reference frequency amplitude	
Oscilloscope – Amplitude ^{FO} (1 M Ω Output Impedance)	V _{pp} = 200 μ V to 100 V	0.25 % + 1 μ V	Tektronix PG506 GIDEP
Oscilloscope – Amplitude ^{FO} (50 Ω Output Impedance)	V _{pp} = 100 μ V to 5 V	0.25 % + 1 μ V	
Oscilloscope - Time Markers ^{FO}	1 ns to 5 s in a 1, 2, 5 sequence	1 200 μ s/s	Tektronix TG501 GIDEP
Frequency Modulation – Peak Deviation (at the listed frequencies) ^{FO}			HP 8902A GIDEP
Frequency range of 250 kHz to 10 MHz and a rate of 20 Hz to 10 kHz	300 Hz to 4 kHz	2 % of reading + 1 Hz	
Frequency range of 10 MHz to 1 300 MHz and a rate of 20 Hz to 50 Hz	300 Hz to 4 kHz	5 % of reading + 1 Hz	
Frequency range of 10 MHz to 1 300 MHz and a rate of 50 Hz to 100 kHz	300 Hz to 4 kHz	1 % of reading + 1 Hz	
Frequency range of 10 MHz to 1 300 MHz and a rate of 100 kHz to 200 kHz	300 Hz to 4 kHz	5 % of reading + 1 Hz	
Frequency Modulation – Peak Deviation (at the listed frequencies) ^{FO}			
Frequency range of 250 kHz to 10 MHz and a rate of 20 Hz to 10 kHz	4 kHz to 40 kHz	2 % of reading + 10 Hz	
Frequency range of 10 MHz to 1 300 MHz and a rate of 20 Hz to 50 Hz	4 kHz to 40 kHz	5 % of reading + 10 Hz	
Frequency range of 10 MHz to 1 300 MHz and a rate of 50 Hz to 100 kHz	4 kHz to 40 kHz	1 % of reading + 10 Hz	
Frequency range of 10 MHz to 1 300 MHz and a rate of 100 kHz to 200 kHz	4 kHz to 40 kHz	5 % of reading + 10 Hz	



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 (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Frequency Modulation – Peak Deviation (at the listed frequencies) ^{FO}			HP 8902A GIDEP
Frequency range of 10 MHz to 1 300 MHz and a rate of 20 Hz to 50 Hz	40 kHz to 400 kHz	5 % of reading + 100 Hz	
Frequency range of 10 MHz to 1 300 MHz and a rate of 50 Hz to 100 kHz	40 kHz to 400 kHz	1 % of reading + 100 Hz	
Frequency Modulation – Peak Deviation (at the listed frequencies) ^{FO}			HP 8902A GIDEP
Frequency range of 10 MHz to 1 300 MHz and a rate of 100 kHz to 200 kHz	40 kHz to 400 kHz	5 % of reading + 100 Hz	
Amplitude Modulation – Peak Depth (at the listed frequencies) ^{FO}			
Frequency range of 150 kHz to 10 MHz and a rate of 50 Hz to 10 kHz	5 % to 40 %	2 % of reading + 0.01 % AM	
Frequency range of 150 kHz to 1 300 MHz and a rate of 20 Hz to 50 Hz	5 % to 40 %	3 % of reading + 0.01 % AM	
Frequency range of 10 MHz to 1 300 MHz and a rate of 50 Hz to 50 kHz	5 % to 40 %	1 % of reading + 0.01 % AM	
Frequency range of 10 MHz to 1 300 MHz and a rate of 50 kHz to 100 kHz	5 % to 40 %	3 % of reading + 0.01 % AM	
Amplitude Modulation – Peak Depth (at the listed frequencies) ^{FO}			
Frequency range of 150 kHz to 10 MHz and a rate of 50 Hz to 10 kHz	40 % to 99 %	2 % of reading + 0.1 % AM	
Frequency range of 150 kHz to 1 300 MHz and a rate of 20 Hz to 50 Hz	40 % to 99 %	3 % of reading + 0.1 % AM	
Frequency range of 10 MHz to 1 300 MHz and a rate of 50 Hz to 50 kHz	40 % to 99 %	1 % of reading + 0.1 % AM	
Frequency range of 150 kHz to 1 300 MHz and a rate of 50 kHz to 100 kHz	40 % to 99 %	3 % of reading + 0.1 % AM	



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 (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
RF Power (at the listed frequencies) ^{FO}			HP 438A with HP 8485D Sensor GIDEP
50 MHz to 100 MHz	0.1 nW to 1 μ W	3.82 % of reading	
100 MHz to 2.3 GHz	0.1 nW to 1 μ W	3.31 % of reading	
2.3 GHz to 4 GHz	0.1 nW to 1 μ W	5.01 % of reading	
4 GHz to 12 GHz	0.1 nW to 1 μ W	6.11 % of reading	
12 GHz to 18 GHz	0.1 nW to 1 μ W	7.66 % of reading	
18 GHz to 20 GHz	0.1 nW to 1 μ W	8.8 % of reading	
20 GHz to 26.5 GHz	0.1 nW to 1 μ W	12.32 % of reading	
RF Power (at the listed frequencies) ^{FO}			HP 438A with HP 8482A Sensor GIDEP
100 kHz to 300 kHz	1 μ W to 2.24 mW	13.27 % of reading	
300 kHz to 1 MHz	1 μ W to 2.24 mW	5.39 % of reading	
1 MHz to 10 MHz	1 μ W to 2.24 mW	3.09 % of reading	
RF Power (at the listed frequencies) ^{FO}			HP 438A with HP 8481A Sensor GIDEP
100 kHz to 300 kHz	2.24 mW to 10 mW	21.88 % of reading	
300 kHz to 1 MHz	2.24 mW to 10 mW	8.77 % of reading	
1 MHz to 10 MHz	2.24 mW to 10 mW	4.74 % of reading	
RF Power (at the listed frequencies) ^{FO}			HP 438A with HP 8481A Sensor GIDEP
10 MHz to 2 GHz	1 μ W to 10 mW	2.33 % of reading	
2 GHz to 12.4 GHz	1 μ W to 10 mW	5.85 % of reading	
12.4 GHz to 18 GHz	1 μ W to 10 mW	8.35 % of reading	
RF Power (at the listed frequencies) ^{FO}			HP 438A with HP 8485A Sensor GIDEP
2 GHz to 12.4 GHz	10 mW to 100 mW	6.57 % of reading	
12.4 GHz to 18 GHz	10 mW to 100 mW	8.88 % of reading	
RF Power (at the listed frequencies) ^{FO}			HP 438A with HP 8485A Sensor GIDEP
18 GHz to 26.5 GHz	1 μ W to 10 mW	10.9 % of reading	
18 GHz to 26.5 GHz	10 mW to 100 mW	11.3 % of reading	



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 (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Equipment to Measure Relative Tuned RF Power Level At the listed frequencies ^{FO} (10 MHz to 1 300 MHz)	100 μ W to 1 mW	4.02 % of reading	HP 8902A with HP 11722A Sensor Module GIDEP
	10 μ W to 100 μ W	4.06 % of reading	
	1 μ W to 10 μ W	4.09 % of reading	
	100 nW to 1 μ W	4.13 % of reading	
	10 nW to 100 nW	4.81 % of reading	
	1 nW to 10 nW	4.89 % of reading	
	100 pW to 1 nW	4.95 % of reading	
	10 pW to 100 pW	7.33 % of reading	
	1 pW to 10 pW	7.96 % of reading	
	100 fW to 1 pW	8.03 % of reading	
	10 fW to 100 fW	8.1 % of reading	
	1 fW to 10 fW	8.15 % of reading	
	0.2 fW to 1 fW	10.03 % of reading	

Time and Frequency

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Equipment to Measure Frequency Fixed Point ^{FO}	100 kHz	7 parts in 10^{12} of reading	HP 5061A GIDEP
	1 MHz	7 parts in 10^{12} of reading	
	5 MHz	7 parts in 10^{12} of reading	
Equipment to Measure Frequency ^{FO}	0.1 Hz to 21 MHz	5 parts in 10^6 of reading	HP 3325B GIDEP
	100 kHz to 1 040 MHz	7 parts in 10^9 of reading	HP 8657A GIDEP
	10 MHz to 26.5 GHz	2.5 parts in 10^7 of reading	HP 8340B GIDEP
Equipment to Output Frequency ^{FO}	20 Hz to 500 MHz	50 Hz	HP 5345A GIDEP
	500 MHz to 1.5 GHz	200 Hz	HP 5345A 5355A GIDEP
	1.5 GHz to 18 GHz	1.8 kHz	HP 5345A 5356A GIDEP
	18 GHz to 26.5 GHz	32 kHz	HP 5361B GIDEP
Stopwatches/Timers ^F	10 s to 24 hrs	38 mS	HP 8657A/HP5345A GIDEP



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:

Thermodynamic

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Thermocouple Type J ^{FO}	50 °C	2.7 °C	Ametek 650SE Dry Well, HP 3458A, Fluke 5500A, RTD Probe GIDEP
	100 °C	2.8 °C	
	150 °C	2.9 °C	
	200 °C	3.0 °C	
	250 °C	3.1 °C	
	300 °C	3.3 °C	
Thermocouple Type K ^{FO}	50 °C	2.7 °C	
	100 °C	2.8 °C	
	150 °C	2.9 °C	
	201 °C	3.0 °C	
	250 °C	3.1 °C	
	300 °C	3.3 °C	
Thermocouple Type T ^{FO}	50 °C	1.5 °C	
	100 °C	1.6 °C	
	150 °C	1.8 °C	
	200 °C	2.3 °C	
	250 °C	2.8 °C	
	300 °C	3.3 °C	
RH Meters/Recorders Fixed Points ^{FO}	75.3 % RH	1 % RH at 25 °C	Salt Solutions - GIDEP Sodium Chloride
	75.5 % RH	1 % RH at 20 °C	
	32.8 % RH	1 % RH at 25 °C	Salt Solutions - GIDEP Magnesium Chloride
	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 (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Gage Block ^F	0.1 in to 0.95 in	(3 + 1.3L) μ in	Federal 130B-16 GIDEP
	1 in to 4 in	(2.8 + 2L) μ in	
Outside Micrometer ^F	0.1 in to 4 in	(38 + 5L) μ in	Gage Blocks GIDEP
	5 in to 20 in	(28 + 8L) μ in	
	21 in to 40 in	(539 + 3L) μ in	
Depth Micrometer ^F	0.1 in to 6 in	(53 + 5L) μ in	Gage Blocks GIDEP
	7 in to 12 in	(40 + 6L) μ in	
Drop Indicator ^F	0.000 5 in to 2 in	(72 + 11L) μ in	Gage Blocks GIDEP



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:

Dimensional

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Micrometer Head ^F	0.1 in to 2 in	(47 + 9L) μ in	Gage Blocks GIDEP
Test Indicator ^F	0.000 5 in to 0.008 in	(58 + 0.7L) μ in	
Height Gage ^F	0.1 in to 40 in	(301 + 4L) μ in	
Caliper ^F	0.1 in to 40 in	(295 + 8L) μ in	
Height Master ^F	1 in to 12 in	(84 + 2L) μ in	
	12 in to 24 in	(62 + 4L) μ in	
Super Micrometer ^F	0.1 in to 1 in	37 μ in	Mahr 828 - GIDEP
Cylindrical Plug/Pin ^{FO}	0.01 in to 1 in	52 μ in	

Mechanical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Pressure Gage ^{FO}	-30 inHg to 0 inHg	0.018 inHg	Ruska 6220-05A GIDEP
	0 psi 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	Heise HQS-2/FM - GIDEP
	300 psi to 1 500 psi	1.2 psi	
	1 500 psi to 5 000 psi	5.7 psi	
	5 000 psi to 10 000 psi	29 psi	Seegars SS-2170-1000 GIDEP
Torque Gages ^{FO}	2.5 ozf-in to 25 ozf-in	0.6 ozf-in	Sturtevant-Richmont System 5 TT2510 GIDEP
	25 ozf-in to 80 ozf-in	1.5 ozf-in	
	80 ozf-in to 160 ozf-in	3 ozf-in	Sturtevant-Richmont System 5 T40010 GIDEP
	10 lbf-in to 25 lbf-in	0.35 lbf-in	
	25 lbf-in to 50 lbf-in	0.62 lbf-in	
	50 lbf-in to 100 lbf-in	1.5 lbf-in	Sturtevant-Richmont System 5 TT3001 GIDEP
	100 lbf-in to 300 lbf-in	3.1 lbf-in	
	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	



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:

Mechanical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Torque Gages ^{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	
Torque Calibrator ^{FO}	5 in·lbs to 50 in·lbs	(0.11 + 0.0016T) in·lbs	Class F weights/Torque Arms GIDEP
	180 in·lbs to 1 800 in·lbs	(3.9 + 0.0016T) in·lbs	
	300 in·lbs to 3 000 in·lbs	(6.5 + 0.0016T) in·lbs	
	1 in·lbs to 12 000 in·lbs	(25.8 + 0.0016T) in·lbs	
Rockwell Hardness Tester ^O	(10 to 30) HRC	1.6 HRC	Standards A, B, C, E, N, & T 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 5 Hz to 10 000 Hz	5 Hz to 20 Hz \pm 5.062 %	Reference Accelerometer/Vibration Controller GIDEP /Mfr Manuals
		20 Hz to 100 Hz \pm 3.80 %	
		100 Hz to 2 500 Hz \pm 3.014 %	
		2 500 Hz to 10 kHz \pm 5.261 %	

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 performed by the laboratory 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: Micrometer^F would mean that the laboratory performs this calibration 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. Example: Micrometer^O would mean that the laboratory performs this calibration onsite at the customer's location.



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:

5. 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.
6. 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.
7. The term L represents length in inches or millimeters as appropriate to the uncertainty statement.

