PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

Repair and Calibration Ltd.

Unit 1 Weighbridge Row, Cardiff Road Reading Berkshire RG1 8LX

(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 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:*
December 11, 2020	December 15, 2022	February 28, 2025

Accreditation No.:	*Certificate No.:*
110993	L22-853

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

Repair and Calibration Ltd.
Unit 1 Weighbridge Row, Cardiff Road Reading Berkshire RG1 8LX
Contact Name: Jonathan Lee Phone: 1189-588391

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

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 Output DC Voltage[F]	100 mV	2.1 µV	HP 3458A DMM Procedure NS02
	1 V	12 µV	
	10 V	70 µV	
	100 V	1.9 mV	
	1 kV	14 mV	
	10 kV	4 V (at 1.0 V output)	Fluke 80 Divider Procedure NS02
Equipment to Measure DC Voltage[F]	100 mV	0.04 mV	Datron 4700 Multi-Function Calibrator Procedure NS02
	1 V	0.02 mV	
	10 V	0.18 mV	
	100 V	1.9 mV	
	1 kV	19 mV	
	10 kV	4 V	
Equipment to Output DC Resistance[F]	10 Ω	1 mΩ	HP 3458A DMM Procedure NS01
	100 Ω	7 mΩ	
	1 kΩ	16 mΩ	
	10 kΩ	1.2 Ω	
	100 kΩ	78 Ω	
	1 MΩ	80 Ω	
	10 MΩ	200 Ω	
	100 MΩ	610 Ω	
Equipment to Measure DC Resistance[F]	10 Ω	0.6 mΩ	Datron 4700 Multi-Function Calibrator Procedure NS01
	100 Ω	2.5 mΩ	
	1 kΩ	25 mΩ	
	10 kΩ	250 mΩ	
	100 kΩ	3.5 Ω	
	1 MΩ	65 Ω	
	10 MΩ	1.2 kΩ	
	100 MΩ	50 kΩ	
Equipment to Output DC Current[F]	100 µA	24 nA	HP 3458A DMM Procedure NS03
	1 mA	6.5 µA	
	10 mA	11 µA	
	100 mA	41 µA	
	1 A	160 µA	
	10 A	8 mA	

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Equipment to Measure DC Current[F]	100 µA	32 nA	Datron 4700 Multi-Function Calibrator Procedure NS03 WaveTek 9100 w/ 50 Coil
	1 mA	320 nA	
	10 mA	3.2 µA	
	100 mA	45 µA	
	1 A	0.95 mA	
	10 A to 700 A	1.5 A	
Equipment to Output AC Voltage (at the listed frequencies)[F]			HP 3458A DMM Procedure NS04
10 Hz to 20 kHz	100 mV	48 µV	
10 Hz to 20 kHz	1 V	480 µV	
10 Hz to 20 kHz	10 V	4.8 mV	
10 Hz to 20 kHz	100 V	11 mV	
45 Hz to 20 kHz	1 kV	130 mV	
Equipment to Measure AC Voltage (at the listed frequencies)[F]			Datron 4700 Multi-Function Calibrator Procedure NS04
30 Hz to 30 kHz	100 mV	43. µV	
30 Hz to 30 kHz	1 V	450 µV	
30 Hz to 30 kHz	10	850 µV	
30 Hz to 30 kHz	100 V	11 mV	
45 Hz to 30 kHz	1 kV	55 mV	
Equipment to Output AC Current (at the listed frequencies)[F]			Wavetek 9100 w/ 50 Coil Procedure NS07
40 Hz to 400 Hz	10 A to 200 A	1.7 A	
40 Hz to 400 Hz	200 A to 700 A	11 A	
Equipment to Measure AC Current (at the listed frequencies)[F]			Datron 4700 Multi-Function Calibrator Procedure NS05
45 Hz to 1 kHz	100 µA	0.62 µA	
45 Hz to 1 kHz	1 mA	6.2 µA	
45 Hz to 1 kHz	10 mA	62 µA	
45 Hz to 1 kHz	100 mA	620 µA	
45 Hz to 1 kHz	1 A	7.6 mA	
45 Hz to 1 kHz	10 A	33 mA	

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Equipment to Measure AC Current (at the listed frequencies)[F]			HP3458A DMM Procedure NS05
45 HZ to 5 kHz	10 µA	78 nA	
45 HZ to 5 kHz	100 µA	520 nA	
45 HZ to 5 kHz	1 mA	7.2 µA	
45 HZ to 5 kHz	10 mA	52 µA	
45 HZ to 5 kHz	100 mA	0.16 mA	
45 HZ to 5 kHz	1 A	7.8 mA	
Frequency Generation and measurement			Racal Dana 9475 Rubidium Frequency Standard Procedure NS06 Agilent 53131A Counter Procedure NS06
Specific values[F]	0.1MHz	2 mHz	
	1 MHz	20 mHz	
	5 MHz	25 mHz	
	10 MHz	200 mHz	
Other Values[F]	10 Hz	10 nHz	
	100 Hz	10 nHz	
	1 kHz	12 mHz	
	10 kHz	1.2 mHz	
	100 kHz	2 mHz	
	1 MHz	20 mHz	
	5 MHz	25 mHz	
	10 MHz	200 mHz	
	100 MHz	330 mHz	
	160 MHz	310 mHz	
Oscilloscopes:			Fluke 9500 w/600 MHz Scope Module Procedure NS011
Time Interval[F]	2 ns	0.004 ns	
	10 ns	0.02 ns	
	100 ns	0.2 ns	
	10 µs	2 ns	
	100 µs	20 ns	
	1 ms	0.2 ns	
	10 ms	2.0 µs	
	100 ms	20 µs	
	1s	200 µs	

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Vertical Deflection[F]	1 mV	5 µV	Fluke 9500 w/600 MHz Scope Module Procedure NS011
	10 mV	50 µV	
	100 mV	500 µV	
	300 mV	5 mV	
	3 V	50 mV	
	30 V	300 mV	
	190 V	570 mV	
Bandwidth[F]	10 mV p-p to 5 V p-p	0.3 %	
	10 MHz to 400 MHz	3.0 %	

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.