PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

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

Maccor, Inc.

4322 S. 49th W. Avenue, Tulsa, OK 74107

and hereby declares that the Organization is accredited in accordance with the recognized International Standard:

ISO/IEC 17025:2017

Whereby, technical competence has been confirmed for the associated scope supplement, in the fields of:

Electrical Calibration

(As detailed in the supplement)

Accreditation claims for conformity assessment activities shall only be made from the addresses referenced within this certificate and shall apply solely to those activities identified in the related scope. This Accreditation is granted subject to the Accreditation Body rules governing the Accreditation referred to above, and the Organization hereby commits to observing and complying with those rules in their entirety.

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 24, 2019	October 09, 2025	December 31, 2027

Accreditation No.:	*Certificate No.:*
76376	L25-758

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

Maccor, Inc.
4322 S. 49th W. Avenue, Tulsa, OK 74107
Contact Name: Mike Baker Phone: 918-202-9692

Accreditation is granted to the facility to perform the following conformity assessment activities:

FIELD OF CALIBRATION	MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	EXPANDED MEASUREMENT UNCERTAINTY (±) [1]	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED	FLEX CODE	LOCATION OF ACTIVITY
Electrical	Equipment to Measure Resistance	Up to 0.1 Ω	1.8 μΩ/Ω	OHM-Labs MRS Fluke 8588A	LOP-72-01 LOP-72-02 LOP-72-03	F1, F3	F
Electrical	Equipment to Measure Resistance	0.1 Ω to 1 Ω	2.5 μΩ/Ω	OHM-Labs MRS Fluke 8588A	LOP-72-01 LOP-72-02 LOP-72-03	F1, F3	F
Electrical	Equipment to Measure Resistance	1 Ω to 10 Ω	0.7 μΩ/Ω	OHM-Labs MRS Fluke 8588A	LOP-72-01 LOP-72-02 LOP-72-03	F1, F3	F
Electrical	Equipment to Measure Resistance	10 Ω to 100 Ω	0.6 μΩ/Ω	OHM-Labs MRS Fluke 8588A	LOP-72-01 LOP-72-02 LOP-72-03	F1, F3	F
Electrical	Equipment to Measure Resistance	100 Ω to 500 Ω	0.9 μΩ/Ω	OHM-Labs MRS Fluke 8588A	LOP-72-01 LOP-72-02 LOP-72-03	F1, F3	F
Electrical	Equipment to Measure Resistance	500 Ω to 10 kΩ	0.4 μΩ/Ω	OHM-Labs MRS Fluke 8588A	LOP-72-01 LOP-72-02 LOP-72-03	F1, F3	F
Electrical	Equipment to Measure Resistance	10 kΩ to 50 kΩ	0.7 μΩ/Ω	OHM-Labs MRS Fluke 8588A	LOP-72-01 LOP-72-02 LOP-72-03	F1, F3	F
Electrical	Equipment to Measure Resistance	Up to 100 μΩ	21 μΩ/Ω	OHM-Labs MCS Fluke 8588A	LOP-72-02 LOP-72-03	F1, F3	F
Electrical	Equipment to Measure Resistance	100 μΩ to 1 mΩ	14 μΩ/Ω	OHM-Labs MCS Fluke 8588A	LOP-72-02 LOP-72-03	F1, F3	F
Electrical	Equipment to Measure Resistance	1 mΩ to 10 mΩ	10 μΩ/Ω	OHM-Labs MCS Fluke 8588A	LOP-72-02 LOP-72-03	F1, F3	F
Electrical	Equipment to Measure Resistance	10 mΩ to 100 mΩ	1.8 μΩ/Ω	OHM-Labs MCS Fluke 8588A	LOP-72-02 LOP-72-03	F1, F3	F

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Electrical	Equipment to Measure Resistance	100 mΩ to 1 Ω	3.8 µΩ/Ω	OHM-Labs MCS Fluke 8588A	LOP-72-02 LOP-72-03	F1, F3	F
Electrical	Equipment to Measure DC Voltage	100 mV	0.48 µV/V	Fluke 8588A	LOP-72-04	F1, F3	F
Electrical	Equipment to Measure DC Voltage	1 V	16 µV/V	Fluke 8588A	LOP-72-04	F1, F3	F
Electrical	Equipment to Measure DC Voltage	10 V	3 µV/V	Fluke 8588A	LOP-72-04	F1, F3	F
Electrical	Equipment to Measure DC Voltage	100 V	2.6 µV/V	Fluke 8588A	LOP-72-04	F1, F3	F
Electrical	Equipment to Measure DC Voltage	1 000 V	3 µV/V	Fluke 8588A	LOP-72-04	F1, F3	F
Electrical	Equipment to Measure DC Voltage	100 mV	4.1 µV/V	Keysight 34470A	LOP-72-04	F1, F3	F, O
Electrical	Equipment to Measure DC Voltage	1 V	2.1 µV/V	Keysight 34470A	LOP-72-04	F1, F3	F, O
Electrical	Equipment to Measure DC Voltage	10 V	1.4 µV/V	Keysight 34470A	LOP-72-04	F1, F3	F, O
Electrical	Equipment to Measure DC Voltage	100 V	3.3 µV/V	Keysight 34470A	LOP-72-04	F1, F3	F, O
Electrical	Equipment to Measure DC Voltage	1 000 V	3.9 µV/V	Keysight 34470A	LOP-72-04	F1, F3	F, O
Electrical	Equipment to Measure DC Current	Up to <30 µA	2.6 µA/A	Isotek Shunt RUG-Z 1mΩ RUG-Z 10mΩ Keysight 34470A Maccor Auto-Calibrator	LOP-72-06	F1, F3	F, O
Electrical	Equipment to Measure DC Current	30 µA to <150 µA	2.6 µA/A	Isotek Shunt RUG-Z 1mΩ RUG-Z 10mΩ Keysight 34470A Maccor Auto-Calibrator	LOP-72-06	F1, F3	F, O
Electrical	Equipment to Measure DC Current	150 µA to <1 mA	2.7 µA/A	Isotek Shunt RUG-Z 1mΩ RUG-Z 10mΩ Keysight 34470A Maccor Auto-Calibrator	LOP-72-06	F1, F3	F, O

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Electrical	Equipment to Measure DC Current	1 mA to <5 mA	2.5 µA/A	Isotek Shunt RUG-Z 1mΩ RUG-Z 10mΩ Keysight 34470A Maccor Auto-Calibrator	LOP-72-06	F1, F3	F, O
Electrical	Equipment to Measure DC Current	5 mA to <30 mA	3.4 µA/A	Isotek Shunt RUG-Z 1mΩ RUG-Z 10mΩ Keysight 34470A Maccor Auto-Calibrator	LOP-72-06	F1, F3	F, O
Electrical	Equipment to Measure DC Current	30 mA to <150 mA	3.4 µA/A	Isotek Shunt RUG-Z 1mΩ RUG-Z 10mΩ Keysight 34470A Maccor Auto-Calibrator	LOP-72-06	F1, F3	F, O
Electrical	Equipment to Measure DC Current	150 mA to <1 A	6.2 µA/A	Isotek Shunt RUG-Z 1mΩ RUG-Z 10mΩ Keysight 34470A Maccor Auto-Calibrator	LOP-72-06	F1, F3	F, O
Electrical	Equipment to Measure DC Current	1 A to <5 A	6.2 µA/A	Isotek Shunt RUG-Z 1mΩ RUG-Z 10mΩ Keysight 34470A Maccor Auto-Calibrator	LOP-72-06	F1, F3	F, O
Electrical	Equipment to Measure DC Current	5 A to <60 A	6.2 µA/A	Isotek Shunt RUG-Z 1mΩ RUG-Z 10mΩ Keysight 34470A Maccor Auto-Calibrator	LOP-72-06	F1, F3	F, O

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Electrical	Equipment to Measure DC Current	60 A to <200 A	14 µA/A	Isotek Shunt RUG-Z 1mΩ RUG-Z 10mΩ Keysight 34470A Maccor Auto-Calibrator	LOP-72-06	F1, F3	F, O
Electrical	Equipment to Measure DC Current	200 A to <300 A	3 µA/A	OHM-Labs CS-500 CS-1000 Keysight 34470A	LOP-72-06	F1, F3	F, O
Electrical	Equipment to Measure DC Current	300 A to <400 A	7 µA/A	OHM-Labs CS-500 CS-1000 Keysight 34470A	LOP-72-06	F1, F3	F, O
Electrical	Equipment to Measure DC Current	400 A to <500 A	7 µA/A	OHM-Labs CS-500 CS-1000 Keysight 34470A	LOP-72-06	F1, F3	F, O
Electrical	Equipment to Measure DC Current	500 A to <600 A	26 µA/A	OHM-Labs CS-500 CS-1000 Keysight 34470A	LOP-72-06	F1, F3	F, O
Electrical	Equipment to Measure DC Current	600A to <800 A	15 µA/A	OHM-Labs CS-500 CS-1000 Keysight 34470A	LOP-72-06	F1, F3	F, O
Electrical	Equipment to Measure DC Current	800 A to <1 000 A	8 µA/A	OHM-Labs CS-500 CS-1000 Keysight 34470A	LOP-72-06	F1, F3	F, O

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Electrical	Equipment to Measure DC Current	1 000 A to <3 000 A	110 µA/A	EMPRO 3000A Shunt S/N: TC0508 Keysight 34470A	LOP-72-06	F1, F3	F, O

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. Location of activity:

Location Code	Location
F	Conformity assessment activity is performed at the CABs fixed facility
O	Conformity assessment activity is performed onsite at the CABs customer location

4. 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.