



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

CLOSED LOOP TECHNOLOGIES  
3203 Waldon Ridge Drive  
Orion Township, MI 48359  
Kim Zelkowski Phone: 248 421 7075

CALIBRATION

Valid To: February 28, 2021

Certificate Number: 5079.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations<sup>1, 5</sup>:

I. Dimensional

Parameter/Equipment	Range	CMC <sup>2</sup> (±)	Comments
Linear Displacement – Encoder <sup>3</sup>	(0.4 to 12) in	0.000 93 in	Boeckeler glass encoder

II. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC <sup>2, 4</sup> (±)	Comments
DC Voltage <sup>3</sup> – Measure	Up to 10 V	0.000 53 V	Agilent 34401A multimeter

Parameter/Range	Frequency	CMC <sup>2, 4</sup> (±)	Comments
AC Voltage <sup>3</sup> – Measure (1 to 750) V	5 Hz to 10 kHz	0.000 36 V	Agilent 34401A multimeter

### III. Mechanical

Parameter/Equipment	Range	CMC <sup>2, 6</sup> (±)	Comments
Accelerometers <sup>3</sup>	(5 to 3000) Hz	2.8 % FS	ISO/FDIS 16063-21:2003 (E)
Force – Load Cells <sup>3</sup>	(20 to 500) lbf (25 to 1100) lbf (200 to 5000) lbf (150 to 11 000) lbf (130 to 25 000) lbf (1100 to 50 000) lbf (3500 to 100 000) lbf	0.58 lbf 0.50 lbf 2.4 lbf 6.9 lbf 24 lbf 120 lbf 72 lbf	ASTM E4-16 Interface load cells
Torque <sup>3</sup> – Measure	(15 000 to 50 000) in-lbs	45 in-lbs	Honeywell Sensotech torque cell

### IV. Time & Frequency

Parameter/Equipment	Frequency	CMC <sup>2, 6</sup> (±)	Comments
Frequency <sup>3</sup> – Measure	5 Hz to 10 kHz	0.0055 Hz	Agilent 34401A multimeter

<sup>1</sup> This laboratory offers commercial calibration service and field calibration service.

<sup>2</sup> Calibration and Measurement Capability Uncertainty (CMC) is the smallest uncertainty of measurement that a laboratory can achieve within its scope of accreditation when performing more or less routine calibrations of nearly ideal measurement standards of nearly ideal measuring equipment. CMC's represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of  $k = 2$ . The actual measurement uncertainty of a specific calibration performed by the laboratory may be greater than the CMC due to the behavior of the customer's device and to influences from the circumstances of the specific calibration.

<sup>3</sup> Field calibration service is available for this calibration and this laboratory meets A2LA R104 – General Requirements: Accreditation of Field Testing and Field Calibration Laboratories for these calibrations. Please note the actual measurement uncertainties achievable on a customer's site can normally be expected to be larger than the CMC found on the A2LA Scope. Allowance must be made for aspects such as the environment at the place of calibration and for other possible adverse effects such as those caused by transportation of the calibration equipment. The usual allowance for the uncertainty introduced by the item being calibrated, (e.g. resolution) must also be considered and this, on its own, could result in the actual measurement uncertainty achievable on a customer's site being larger than the CMC.

<sup>4</sup> The stated measured values are determined using the indicated instrument (see Comments). This capability is suitable for the calibration of the devices intended to measure or generate the measured value in the ranges indicated. CMCs are expressed as either a specific value that covers the full range or as a percent or fraction of the reading plus a fixed floor specification.

<sup>5</sup> This scope meets A2LA's *P112 Flexible Scope Policy*.

<sup>6</sup> The type of instrument or material being calibrated is defined by the parameter. This indicates the laboratory is capable of calibrating instruments that measure or generate the values in the ranges indicated for the listed measurement parameter.



# Accredited Laboratory

A2LA has accredited

## CLOSED LOOP TECHNOLOGIES

*Orion Twp, MI*

for technical competence in the field of

## Calibration

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets R205 – *Specific Requirements: Calibration Laboratory Accreditation Program*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



Presented this 28<sup>th</sup> day of January 2019.

A blue ink signature of the Vice President of Accreditation Services.

Vice President, Accreditation Services  
For the Accreditation Council  
Certificate Number 5079.01  
Valid to February 28, 2021  
Revised February 19, 2021

*For the calibrations to which this accreditation applies, please refer to the laboratory's Calibration Scope of Accreditation.*