



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

SERVO INNOVATIONS, LLC
2560 S Patterson Rd
Wayland, MI 49348
Troy Diller Phone: 269 792 9279 Ext. 111

CALIBRATION

Valid To: February 28, 2025

Certificate Number: 2444.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations^{1,5}:

I. Dimensional

Parameter/Equipment	Range	CMC ² (±)	Comments
Calipers	Up to 12 in	270 µin	Caliper checker
Micrometers	Up to 1 in	120 µin	Gage blocks
Height Gage	Up to 12 in	270 µin	Caliper checker

II. Electrical – DC & Low Frequency

Parameter/Equipment	Range	CMC ^{2,4,6} (±)	Comments
DC Voltage – Generate ³	Up to 35 V	0.46 %	BK Precision 1770
DC Voltage – Measure	Up to 30 V	0.14 %	Fluke 45

III. Fluid Quantities

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Liquid Flow Meters ³	(5 to 50) gpm	0.38 %	Flow technology, FT-16AEUS-LEAHR

IV. Mechanical

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Accelerometers			
Up to 1 g	6.8 Hz to 10 kHz	0.01 %	Dytran 3120B
Hydraulic Actuators ³ –			
Force – Compression	(0.0010 to 20) lbf Up to 112 lbf Up to 500 lbf Up to 2000 lbf Up to 5000 lbf	0.11 % 0.018 % 0.09 % 0.029 % 0.043 %	ASTM Class F weights, Interface SMT2-112 Servo S6500 HBM S9-10KN Lebow 3132-5K
	(5000 to 10 000) lbf (10 000 to 20 000) lbf	0.069 % 0.19 %	Interface 1210ACK-10K PCB 1204-02B, PCB 8159-0012A
	(20 000 to 50 000) lbf	0.05 %	Interface 1620AJH-50K, Interface 9840
	(50 000 to 100 000) lbf	0.13 %	PCB 1208-02A, PCB 8159-0012A
	(100 000 to 200 000) lbf (200 000 to 400 000) lbf (200 000 to 600 000) lbf	0.11 % 0.12 % 0.22 %	Interface 1250EAJ Strainsense SSTMINI604C
Force – Tension	Up to 110 lbf Up to 500 lbf Up to 2000 lbf	0.013 % 0.09 % 0.029 %	Interface SMT2-112 Servo S6500 HBM S9-10KN
	Up to 5000 lbf	0.094 %	Lebow 3132-5K
	(5000 to 10 000) lbf	0.069 %	Interface 1210ACK-10K

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Hydraulic Actuators ³ – (cont)			
Force – Tension	(5000 to 20 000) lbf	0.10 %	PCB 1204-02B, PCB 8159-0012A Interface 1620AJH-50K, Interface 9840
	(20 000 to 50 000) lbf	0.09 %	
	(50 000 to 100 000) lbf	0.09 %	
	(100 000 to 200 000) lbf (200 000 to 400 000) lbf	0.16 % 0.22 %	
Torque	Up to 500 lbf·in	0.11 %	Clockwise & CCW
	Up to 1000 lbf·in	0.099 %	CW & CCW (arm- weight)
	(500 to 20 000) lbf·in	0.08 %	PCB 2303-02, PCB 8159-0013A
	(20 000 to 100 000) lbf·in (100 000 to 300 000) lbf·in (300 000 to 1 200 000) lbf·in	0.25 % 0.048 % 0.072 %	PCB 1540-01A, PCB 8159-0012A, PCB 1204-02B, PCB 8159- 0012A, & torque arm
Displacement	(0 to 40) in	0.005 in	Newall DSA 1100
Angle	(0 to 360)°	0.28°	Trans-tek 0607-0001
Speed	(6 to 8299) rpm	3.1 rpm	Shimpo DT-205L tachometer
	(8299 to 24 999) rpm	6.9 rpm	
	(25 000 to 99 000) rpm	15 rpm	
Velocity	Up to 2 in/s	0.22 in/s	Stopwatch & Newal DATAQ & LVDT
	(2 to 600) in/s	0.035 in/s	
Pressure	Up to 300 psi	0.13 %	Druck PV 622, pressure Druck PV 623 Crystal XP21
	(300 to 1500) psi	0.11 %	
	(1500 to 10 000) psi	0.12 %	

V. Thermodynamics

Parameter/Equipment	Range	CMC ² (±)	Comments
Temperature ³ – Thermocouple Simulation B, E, J, K, N, R, S, T	(-10 to 122) °C	0.42 °C	Omega CL543
Temperature Probe	(-10 to 110) °C	0.41 °C	Fluke 9102S

¹ This laboratory offers commercial calibration service and field calibration service.

² 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 or nearly ideal measuring equipment. CMCs 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.

³ Field calibration service is available for this calibration. 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 actual 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.

⁴ In the statement of CMC, % is defined as the percentage of full scale unless otherwise noted.

⁵ Fluke This scope meets A2LA's *P112 Flexible Scope Policy*.

⁶ 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 fraction/percentage of the reading plus a fixed floor specification.



Accredited Laboratory

A2LA has accredited

SERVO INNOVATIONS, LLC

Wayland, MI

for technical competence in the field of

Calibration

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 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 28th day of November 2023.

A blue ink signature of Trace McInturff, written in a cursive style.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2444.01
Valid to February 28, 2025

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