



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017
& ANSI/NCSL Z540-1-1994

AUTOMATED PRECISION INC.
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CALIBRATION

Valid To: December 31, 2020

Certificate Number: 2229.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations^{1,3}:

I. Dimensional

| Parameter/Equipment | Range | CMC ² (±) | Comments |
|--|--|--|---|
| Active Target – Centering ADM Offset | Up to 1 mm Up to 100 mm | 0.23 µm 2.1 µm | Straightness sensor, laser tracking system |
| Angle Encoder | Up to 360° | 0.11 arc seconds | Polygon mirror, autocollimator |
| Autocollimator – | X, Y Angle Up to 20 arc seconds Up to 1000 arc seconds | 0.02 arc seconds 0.07 arc seconds | Trans. ref. laser |
| I-360, IntelliProbe 360, IntelliProbe 360 Wireless – I-Scan | Pitch: 80° Yaw: 360° Roll: 360° | 0.94 µm/m 0.94 µm/m 1.1 µm/m 1.7 µm | Laser tracking system, angle encoder |

| Parameter/Equipment | Range | CMC ² (±) | Comments |
|---|--|---|--|
| Laser Interferometer Measuring System With Weather Station (1D, 3D, 5D and 6D) – Displacement Angle Straightness | Up to 80 m Up to 1000 arc seconds Up to 3 mm | 0.1 µm/m 0.07 arc seconds 0.04 µm | 1 st ref. laser, frequency counter, 1 st ref. thermometer, 1 st ref. pressure sensor, trans. ref. laser, weather station |
| IFM Based Laser Tracking System (Radian,T3/T3+, T2/T2+) | Up to 80 m | 0.87 µm/m | 1 st ref. laser, frequency counter, trans. ref. laser, weather station, polygon mirror, autocollimator, angle encoder bundle |
| ADM Based Laser Tracking System (OT2,OT) | Up to 100 m | 0.97 µm/m | Trans. ref. laser, weather station, polygon mirror, autocollimator, angle encoder bundle |
| Pentaprism | 90° ± 600 arc seconds | 0.22 arc seconds | Manual autocollimator |
| Parallelism Kit | Yaw: 90° ± 600 arc seconds | 0.22 arc seconds | Autocollimator |
| Polygon Mirror | Up to 360° | 0.10 arc seconds | Autocollimator |
| Scale Bar | 800 mm | 0.15 µm/m | Trans. ref laser, weather station |

| Parameter/Equipment | Range | CMC ² (±) | Comments |
|---|---|--------------------------------------|--|
| Spherically Mounted Retro-Reflector (SMR) Centering Accuracy | Up to 1 mm 3D centering Up to 1 mm X-Y centering Up to 1 mm Z-depth centering | 0.25 µm 0.15 µm 0.20 µm | Straightness sensor |
| Spindle Analyzer | Up to 0.8 mm | 0.06 µm | Trans. ref. laser |
| Straightness Sensor | Up to 3 mm | 0.04 µm | Trans. ref. laser |
| Angle Sensor | Up to 800 arc seconds | 0.07 arc seconds | Trans. ref. laser |
| XD Level Reference | Up to 1° | 0.07 arc seconds | Trans. ref. laser |
| Swivel Check, Roto Check | Angle Encoder: 360° Level Sensor: 1.5° | 0.11 arc seconds 0.17 arc seconds | Polygon mirror, autocollimator, angle encoder |
| Telescoping Ballbar | Up to 6 mm | 0.06 µm | Trans. ref. laser |
| vProbe | Pitch: 80° Yaw: 80° Roll: 360° | 0.94 µm/m 0.94 µm/m 1.1 µm/m | Laser tracking system, angle encoder |
| SmartTrack Sensor | Pitch: ± 55° Yaw: ± 360° Roll: ± 60° | 1.5 arc seconds | Polygon mirror, autocollimator, angle encoder |
| Trans. Ref. Laser – Wavelength: Distance: | 633 nm Up to 80 m | 0.004 ppm 0.1 µm/m | 1 st ref. laser, frequency counter, 1 st ref. thermometer, 1 st ref. pressure sensor |

| Parameter/Equipment | Range | CMC ² (±) | Comments |
|---------------------|-------------------|----------------------|--------------------------------------|
| Weather Station – | | | |
| Temperature: | (-10 to 60) °C | 0.025 °C | 1 st ref. thermometer |
| Air Pressure: | (375 to 825) mmHg | 0.1 mmHg | 1 st ref. pressure sensor |

¹ Commercial calibration service is not normally available for this laboratory.

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. 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.

³ This scope meets A2LA's *P112 Flexible Scope Policy*.



Accredited Laboratory

A2LA has accredited

AUTOMATED PRECISION INC.

Rockville, MD

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 the requirements of ANSI/NC SLZ540-1-1994 and 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 13th day of May 2019.

A blue ink signature of the Vice President of Accreditation Services, written over a horizontal line.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2229.01
Valid to December 31, 2020

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