CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

Antibus Scales & Systems, Inc.
705 W. Newton Rd.
Bowling Green, OH 43402

Fulfills the requirements of

ISO/IEC 17025:2017

and national standard

ANSI/NCSL Z540-1-1994 (R2002)

In the fields of

CALIBRATION and DIMENSIONAL MEASUREMENT

This certificate is valid only when accompanied by a current scope of accreditation document.
The current scope of accreditation can be verified at www.anab.org.

R. Douglas Leonard Jr., VP, PILR SBU

Expiry Date: 11 May 2024
Certificate Number: L2253.02

This laboratory 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 (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005 AND ANSI/NCSL Z540-1-1994 (R2002)

Antibus Scales & Systems, Inc.
705 W. Newton Rd.
Bowling Green, OH 43402
Bob Bennett
419-872-8628

CALIBRATION AND DIMENSIONAL MEASUREMRENT

Valid to: **May 11, 2024** Certificate Number: **L2253.02**

CALIBRATION

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Resistance Source & Measure [1]	(0 to 55) Ω (55 to 250) Ω (250 to 680) Ω	0.11 Ω 0.74 Ω 1 Ω	Fluke Series Process Calibrator
Electrical Simulation of RTD Indicating Devices [1] Pt 385 100 Ω	(-180 to 750) °C	0.63°C	Fluke Series Process Calibrator
Electrical Simulation of Thermocouple Indicating Devices [1]	Type K (-195 to 1 260) °C Type J (0 to 760) °C Type T (-195to 370) °C	0.87°C 0.87°C 0.87°C	Fluke Series Process Calibrator

Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-) [2]	Reference Standard, Method, and/or Equipment
End Standards	Up to 24 in	(21 + 1.7*L*) µin	Gage Blocks and ULM
Rules and Scales [1]	(0 to 72) in	0.016 in	Gage Blocks, Ruler, and Magnifier

Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-) [2]	Reference Standard, Method, and/or Equipment
Pin Gages [1]	Up to 1 in	31 µin 6.5 µin	Micrometer ULM and Setting Masters
Thread Wires (80 to 6) TPI	(0.007 to 0.097) in	19 µin	ULM and Setting Masters
Gage Blocks	(0.005 to 4) in (0 to 24) in	(2.7 + 1.6*L*) µin (5.5 + 1.4*L*) µin	Comparator and Gage Blocks ULM and Gage Blocks
OD Cylinder/Plug Gages	(0 to 23) in	(7.3 + 4.8*D*) µin	ULM and Gage Blocks
Plain Ring (ID) Gages	(0.02 to 0.75) in (0.75 to 4) in (4 to 17) in	(7.3 + 0.62*D*) µin (8.5 + 4*D*) µin (20 + 2*D*) µin	ULM/Master Rings/Probe ULM and Master Rings
Spheres and Precision Balls Diameter	(0 to 2) in	(30 + 2.1*D*) µin	ULM and Setting Masters
Thread Plugs Pitch Diameter (80 to 6) TPI Major Diameter	(0.007 to 0.097) in Up to 22 in	(106 + 2.7*D*) µin (59 + 1.9*D*) µin	ULM, Setting Masters, and Thread Wires
Adjustable Thread Rings Functional Fit	(0 to 9) in	587 µin	Setting Thread Plugs
Height Gages [1] 0.000 01 in resolution 0.000 5 in resolution 0.001 in resolution	(0 to 40) in	(63 +2.1L) µin (295 + 0.37*L*) µin (581 + 0.36*L*) µin	Gage Blocks
Indicators [1] 0.000 05 in resolution 0.000 5 in resolution 0.000 1 in resolution 0.001 in resolution	(0 to 6) in	(50 + 7.4*L*) µin (297 + 0.09*L*) µin (88 + 10.5*L*) µin (588 + 0.19*L*) µin	Gage Blocks and Indicator Stand
Calipers [1] 0.000 5 in resolution 0.001 in resolution	(0 to 60) in	(291 + 1.1*L*) µin (580 + 0.6 *L*) µin	Gage Blocks
OD Micrometers [1] 0.000 005 in resolution 0.000 05 in resolution 0.000 1 in resolution 0.001 in resolution	(0 to 1) in (0 to 4) in (0 to 12) in (0 to 24) in	(34 + 0.05*L*) µin (70 + 0.07*L*) µin (84 + 0.83*L*) µin (581 + 0.22*L*) µin	Gage Blocks
ID Micrometers [1] 0.001 in resolution	(0 to 23) in	(638 + 1.13*L*) µin	PLM and Gage Blocks

Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-) [2]	Reference Standard, Method, and/or Equipment
Depth Gages [1] 0.000 1 in resolution 0.000 5 in resolution 0.001 in resolution	(0 to 12) in	(104 + 0.86*L*) µin (373 + 6.5*L*) µin (570 + 0.14*L*) µin	Gage Blocks
Bore Gages [1] 0.000 5 in resolution 0.001 in resolution	(0.25 to 4) in (0.25 to 4) in	(373 + 39*L*) µin 578 µin	Master Rings and Gage Blocks
Profilometers for Ra [1] 0.1 µin resolution 1.0 µin resolution	(16 to 120) µin (16 to 120) µin	2.5 µin 9 µin	Master surface finish roughness specimen
Surface Roughness Specimen [1] Ra	(2 to 500) µin	4µin	Surface Finish Analyzer

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Force – Tension and Compression [1,6]	(0 to 100 000) lbf	1d + 0.20% load	Load Cells
Force Gages & Cells: UUTs with accuracies <= 0.1% [1,6]	(0 to 10 000) lbf	1d + 0.033% load	Class F/6 Weights
Force Gages & Cells: UUTs with accuracies > 0.1% [1,6]	(0 to 30 000) lbf	1d + 0.10% load	Class F/6 Weights
Class F/6 and lower Mass Standards	25 lb 50 lb 500 lb 1 000 lb 10 kg 20 kg 25 kg	0.000 52 lb 0.001 0 lb 0.011 lb 0.021 lb 0.23 g 0.41 g 0.51 g	Modified Substitution

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Lab Balances [1,6] (Five & Six Place Balances)	(0 to 500) g	1d + 0.004 1% of load	Class 1 Weights and NIST Handbook 44 utilized for the Calibration of Weighing Systems
(Four Place and Class 1 Equivalent Balances)	(0 to 4 100) g	1d + 0.000 3% of load	
(Class 2 & High Precision Scales)	(0 to 4 100) g	0.6d + 0.000 07% of load	
Lab Balances and High Precision Scales [1,6]	(0 to 35) kg	1d + 0.001 2% of load	Class 2 & 3 Weights and NIST Handbook 44 utilized for the Calibration of Weighing Systems
Lab Balances and High Precision Scales [1,6]	(0 to 150) kg	1d + 0.000 7% of load	Class 1 and Class 2 Weights with Substitution to range of use
High Resolution Unmarked Scales [1,6]	(0 to 5 000) kg (0 to 50 000) lb	1d + 0.012% of load 1d + 0.012% of load	Class F,6 Weights with Substitution to range of use
Industrial and Commercial Scales [1, 4, 6]	(0 to 5 000) kg (0 to 200 000) lb	1d + 0.004% of load 1d + 0.004% of load	Class F,6 Weights with Substitution to range of use
Torque Analyzers – Fixed Points [1]	(4 to 50) lbf·in (30 to 400) lbf·in (80 to 1 000) lbf·in (20 to 250) lbf·ft	0.076 % of reading 0.062 % of reading 0.071 % of reading 0.062 % of reading	Torque Arm and Class F/6 Weights
Torque Wrench [1] With Accuracies of 0 to 1.5% With Accuracies > 1.5%	(4 lbf·in to 250 lbf·ft) (4 lbf·in to 250 lbf·ft)	1.2 % of reading 2.6 % of reading	Torque Analyzer

Thermodynamic

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Temperature – Measure[1] (Ovens and Freezers)	(-195to 1 300) °C	1.3 °C	Fluke Series Process Calibrator

DIMENSIONAL MEASUREMENT

1 Dimensional

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-) [2]	Reference Standard, Method, and/or Equipment
Dimensional Measurement 1D [1]	(0 to 23) in	(39.97 + 6.71*L*) µin	PLM, Gage Blocks, Setting Masters, Master Rings
	(0 to 24) in	121 µin	Indicator and Gage Blocks
	(0 to 4) in	198 µin	Micrometers
	(0 to 18) in	1 275 µin	Calipers and Height Gages

Calibration and Measurement Capability (CMC) is expressed in terms of the measurement parameter, measurement range, expanded uncertainty of measurement and reference standard, method, and/or equipment. The expanded uncertainty of measurement is expressed as the standard uncertainty of the measurement multiplied by a coverage factor of 2 (k=2), corresponding to a confidence level of approximately 95%.

Notes:

1. On-site calibration service is available for this parameter, since on-site conditions are typically more variable than those in the laboratory, larger measurement uncertainties are expected on-site than what is reported on the accredited scope.
2. L = Length in inches, D = Diameter in inches
3. High Resolution Unmarked Scales include high resolution scales not complying with the accuracy class parameters of Table 3 of NIST Handbook 44.
4. Industrial Scales include but are not limited to lab balances, bench scales, floor scales, tank and hopper scales, and vehicle scales.
5. This scope is formatted as part of a single document including Certificate of Accreditation No. L2253.02.
6. When the uncertainty of measurement is significantly impacted by the UUT's resolution, then the uncertainty may be expressed as a formula using the UUT's resolution, represented by "d" above.

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