



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

ZETEC, INCORPORATED
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Snoqualmie, WA 98065
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CALIBRATION

Valid To: August 31, 2019

Certificate Number: 2734.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations¹:

I. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
DC Voltage ³ – Measure	(0 to 100) mV (0.1 to 1) V (1 to 10) V (10 to 100) V (100 to 1000) V	0.0069 % + 4.9 μV 0.0049 % + 15 μV 0.0041 % + 140 μV 0.0053 % + 1.9 mV 0.0052 % + 21 mV	Agilent 34410A
Resistance ³ – Measure	(0 to 100) Ω (0.1 to 1) kΩ (1 to 10) kΩ (10 to 100) kΩ (0.1 to 1) MΩ (1 to 10) MΩ	0.14 % + 6.0 mΩ 0.058 % + 29 mΩ 0.019 % + 290 mΩ 0.015 % + 2.9 Ω 0.041 % + 33 Ω 0.12 % + 1.2 kΩ	Agilent 34410A

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage ³ – Measure			
(0 to 100) mV	10 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz	0.12 % + 60 μV 0.15 % + 51 μV 0.70 % + 93 μV 4.7 % + 580 μV	Agilent 34410A
(0.1 to 1) V	10 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz	0.12 % + 390 μV 1.4 % + 560 μV 0.70 % + 1.2 mV 4.7 % + 6.4 mV	
(1 to 10) V	10 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz	0.11 % + 4 mV 0.15 % + 6 mV 0.70 % + 10 mV 4.7 % + 58 mV	
(10 to 100) V	10 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz	0.11 % + 38 mV 0.16 % + 57 mV 0.17 % + 98 mV 4.7 % + 580 mV	
(100 to 750) V	10 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz	0.11 % + 410 mV 0.16 % + 470 mV 0.70 % + 930 mV	

II. Magnetic (Eddy Current Instrumentation)

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Receiver Amplifier Linearity ³ – Eddy Current Instrumentation	(0 to 100) % of Full Scale	0.51 %	Agilent 33250A
Receiver Quadrature ³ – Eddy Current Instrumentation	(0 to 360)°	0.023°	Agilent 33250A, ZETEC ACM/frequency, Tektronix TDS-3054B

Parameter/Equipment	Range ⁵	CMC ^{2,4} (±)	Comments
Receiver Gain ³ – Eddy Current Instrumentation	(0 to 80) dB	0.26 %	Agilent 33250A, ZETEC ACM/frequency, Tektronix TDS- 3054 B

Parameter/Equipment	Frequency	CMC ^{2,4} (±)	Comments
Coil Driver Frequency ³ – Eddy Current Instrumentation	10 Hz to 6 MHz		Agilent 33250A, ZETEC ACM/frequency, Tektronix TDS- 3054 B & Agilent 34401A or 34410A
	JEAG-4208	0.0018 %	
	ASME BPVC Sections V & XI	0.12 %	
Receiver Frequency Bandwidth ³ – Eddy Current Instrumentation	(8 to 5000) Hz	0.23 %	Agilent 33250A, ZETEC ACM/frequency, Tektronix TDS- 3054 B

III. Time & Frequency

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
Frequency – Measure ³ (10 to 100) mV _{rms}	(3 to 5) Hz	1.2 % + 0.29 μHz	Agilent 34410A
	(5 to 10) Hz	0.59 % + 0.29 μHz	
	(10 to 40) Hz	0.36 % + 0.29 μHz	
	40 Hz to 300 kHz	0.12 % + 250 μHz	
> 100 mV _{rms}	(3 to 5) Hz	0.22 % + 0.29 μHz	Agilent 34410A, & 53132A
	(5 to 10) Hz	0.15 % + 0.29 μHz	
	(10 to 40) Hz	0.057 % + 0.29 μHz	
	40 Hz to 300 kHz	0.012 % + 240 μHz	

¹ This laboratory offers commercial 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 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 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, percentages represent percent of reading unless otherwise noted.

⁵ References to decibels (dB) refer to dB in voltage.



Accredited Laboratory

A2LA has accredited

ZETEC, INCORPORATED

Snoqualmie, WA

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 8 January 2009).



Presented this 7th day of July 2017.

A handwritten signature in black ink, written over a horizontal line.

President and CEO
For the Accreditation Council
Certificate Number 2734.01
Valid to August 31, 2019

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