



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005,
ANSI/NCSL Z540-1-1994

MEGGITT (ORANGE COUNTY), INC.
14600 Myford Road
Irvine, CA 92606
Gil Gonzalez Phone: 949 493 8181

CALIBRATION

Valid To: September 30, 2019

Certificate Number: 1761.01

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 – Measure	(0 to 100) mV 100 mV to 1 V (1 to 10) V (10 to 100) V (10 to 1000) V	1.7 µV 9.7 µV 100 µV 1.4 mV 14 mV	HP 3458A
DC Voltage – Generate	(0 to 220) mV 220 mV to 2.2 V (2.2 to 11) V (11 to 22) V (22 to 220) V (220 to 1100) V	2.4 µV 17 µV 55 µV 95 µV 1.6 mV 9.0 mV	Fluke 5720A
Resistance – Generate, Fixed Points	0 Ω (1, 1.9) Ω (10, 11) Ω (12, 190) Ω (1, 1.9, 10, 19) kΩ	48 µΩ 0.25 mΩ 0.32 mΩ 2.2 mΩ 0.20 Ω	Fluke 5720A

Parameter/Equipment	Range	CMC ^{2,4,5} (±)	Comments
Resistance – Generate, Fixed Points (cont)	(100, 190) kΩ 1 MΩ 1.9 MΩ 10 MΩ 19 MΩ 100 MΩ	2.5 Ω 24 Ω 48 Ω 480 Ω 5.5 kΩ 13 kΩ	Fluke 5720A
Resistance – Measure	(0.1 to 1) Ω (1 to 10) Ω (10 to 100) Ω (100 to 1000) Ω (1 to 10) kΩ (10 to 100) kΩ (100 to 1000) kΩ (1 to 10) MΩ (10 to 100) MΩ (100 to 1000) MΩ	48 μΩ 230 μΩ 2.0 mΩ 13 mΩ 130 mΩ 1.3 Ω 21 Ω 710 Ω 60 kΩ 5.8 MΩ	HP 3458A
Capacitance – Generate at 1 kHz, Fixed Points	0.1 μF 0.01 μF 1000 pF	0.59 % 0.59 % 0.59 %	GR-1409-T GR-1409-L GR-1409-F
Capacitance – Measure at 1 kHz	500 pF to 10 μF	0.61 %	HP 4284A LCR meter

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage – Measure			
(0 to 10) mV	40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz	3.8 µV 5.0 µV 13 µV 60 µV 0.47 mV	HP 3458A
(10 to 100) mV	40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz 300 kHz to 1 MHz	11 µV 38 µV 96 µV 0.36 mV 1.2 mV 1.8 mV	
100 mV to 1 V	40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz 300 kHz to 1 MHz	0.11 mV 0.38 mV 0.95 mV 3.6 mV 12 mV 18 mV	
(1 to 10) V	(1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz 300 kHz to 1 MHz	1.3 mV 1.1 mV 1.9 mV 3.8 mV 36 mV 0.12 V 0.18 V	
(10 to 100) V	40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz	26 mV 26 mV 43 mV 0.15 mV	
(100 to 1000) V	40 Hz to 1 kHz	0.72 V	

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage – Generate			
(0 to 2.2) mV	(10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz	5.4 μV 5.2 μV 5.5 μV 5.8 μV 15 μV 16 μV 29 μV 32 μV	Fluke 5720A
(2.2 to 22) mV	(10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz	7.1 μV 7.1 μV 10 μV 10 μV 39 μV 59 μV 60 μV 93 μV	
(22 to 220) mV	(10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz	32 μV 32 μV 59 μV 0.14 mV 0.26 mV 0.39 mV 0.74 mV 0.74 mV	
220 mV to 2.2 V	(10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz	0.27 mV 0.27 mV 0.23 mV 0.34 mV 1.2 mV 2.1 mV 4.7 mV 4.7 mV	
(2.2 to 22) V	(10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz	2.7 mV 2.7 mV 2.3 mV 3.0 mV 7.8 mV 28 mV 42 mV 42 mV	

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage – Generate (cont)			
(22 to 220) V	(10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz	27 mV 27 mV 18 mV 25 mV 43 mV	Fluke 5720A
	(100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz	0.25 V 1.2 V 2.2 V	Limited w/ 2.2x10 ⁷ V-Hz
(220 to 250) V (250 to 1000) V (250 to 1100) V	15 Hz 50 Hz 50 Hz to 1 kHz	32 mV 23 mV 65 mV	Fluke 5720A
(220 to 1100) V	40 Hz to 1 kHz (1 to 20) kHz (20 to 30) kHz	0.13 V 0.22 V 0.78 V	w/ Fluke 5725 amplifier
(220 to 750) V	30 kHz to 50 kHz (50 to 100) kHz	0.54 V 2.1 V	

II. Mechanical

Parameter/Equipment	Range ³	CMC ^{2,5} (±)	Comments
Acceleration Sensitivity at Reference Frequency	(100 to 160) Hz, 2 g	0.47 %	Tru-Sonic shaker in reciprocity mode
Acceleration Sensitivity/Frequency Response	1 Hz (0.25 to 10) g	1.0 % of output	Long stroke shaker with 7751-500 accelerometer
	(>1 to <100) Hz (0.25 to 10) g	1.0 % of output	
	(10 to 2500) Hz 10 g	1.0 % of output	Comparison system using Bouche shaker and 2270M8 or 2270M7A accelerometers
	(>2500 to 10 000) Hz 10 g	1.0 % of output	

Parameter/Equipment	Range ³	CMC ^{2,5} (±)	Comments
Acceleration Sensitivity/Frequency Response (cont)	(>10 000 to 15 000) Hz; 10 g	2.1 % of output	Comparison system using Bouche shaker and 2270M8 or 2270M7A accelerometers
	(>15 000 to 20 000) Hz; 10 g	3.5 % of output	
Acceleration Resonance Search	(20 000 to 50 000) Hz; 10 g	4.0 % of output	Bouche Shaker (Better uncertainty with finer frequency step)
Acceleration Sensitivity Deviation Due to Temperature	200 Hz; 3 g	2.0 % of output	DAC temperature chamber (-184 to 650) °C; with external shaker and reference accelerometer
Acceleration Transverse Sensitivity	At 11 Hz; 7 g	0.27 %	Transverse sensitivity console using Endeveco crosstalk system manual rotation
Acceleration Amplitude Linearity, Shock	(100 to 2000) g; (0.5 to 2) ms	1.7 % of output	Endevco 2925 exciter w/2270M8 as reference accelerometer
	(>2000 to 10 000) g; (0.1 to 0.5) ms	2.5 % of output	
Acoustic Pressure	140 dB SPL; (500 or 1000) Hz	3.3 % of output	Comparison to model 2510 in electrodynamic driver
Torque – Measure	(1 to 20) in·lbf	3.2 %	Norbar model TST calibrator w/ static transducer
	(1 to 100) in·lbf	2.2 %	
	(1 to 100) ft·lbf	1.6 %	

III. Thermodynamics

Parameter/Equipment	Range	CMC ² (±)	Comments
Temperature – Measure	(-184 to 650) °C	0.64 °C	Fluke Hydra system w/Hart 1502A and 5628

IV. Time & Frequency

Parameter/Equipment	Range	CMC ² (±)	Comments
Frequency – Measuring Equipment	10 MHz	1.2 parts in 10 ¹² Hz	Fluke GPS 910R, locked continuously to GPS

¹ This laboratory offers commercial 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 g is the standard acceleration due to gravity.

⁴ 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.

⁵ In the statement of CMC, percentages are to be read as percent of reading unless noted otherwise.



Accredited Laboratory

A2LA has accredited

MEGGITT (ORANGE COUNTY), INC.

Irvine, CA

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 the requirements of ANSI/NCSL Z540-1-1994 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 8 January 2009).



Presented this 29th day of December 2017.

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

President and CEO
For the Accreditation Council
Certificate Number 1761.01
Valid to September 30, 2019

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