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

CRYSTAL ENGINEERING CORPORATION, AN AMETEK INC. COMPANY
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CALIBRATION

Valid To: September 30, 2017 Certificate Number: 2601.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations[1]:

I. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC[2, 3] (±)	Comments
DC Voltage – Measure	(0 to 12) V (>12 to 30) V (>30 to 100) V	0.00018 % + 0.00058 V 0.00043 % + 0.00055 V 0.00080 % + 0.00044 V	Agilent 3458A DMM
DC Voltage – Generate	(0 to 12) V (>12 to 30) V (>30 to 110) V	0.00012 % + 0.00058 V 0.00047 % + 0.00054 V 0.00080 % + 0.00044 V	Analog system (DC voltage source & Agilent 3458A DMM) (to characterize product -20 to 50°C)
DC Current – Generate	(0 to 10) mA (>10 to 100) mA	0.0011 % + 0.00057 mA 0.0039 % + 0.00074 mA	Analog system (DC current source & Agilent 3458A DMM) (to characterize product -20 to 50°C)

Parameter/Equipment	Range	CMC[2, 3] (±)	Comments
DC Current - Measure	(0 to 10) mA (>10 to 100) mA	0.00090 % + 0.00056 mA 0.0039 % + 0.00065 mA	Agilent 3458A DMM
Resistance – Generate Fixed Value (Four Terminal)	0.0010 Ω 100 Ω 200 Ω 400 Ω	5.8 mΩ 5.8 mΩ 5.8 mΩ 5.8 mΩ	Company resistor box
Resistance - Measure	(0.0010 to 100) Ω (>100 to 400) Ω	0.000034 % + 0.0058 Ω 0.00078 % + 0.0049 Ω	Agilent 3458A DMM

II. Mechanical

Parameter/Equipment	Range	CMC[2] (±)	Comments
Pressure – Gas	(-14.5 to 0) psi	[0.000033 % of rdg]^2 + 0.00013 % + 0.000058 psi	DHI PG7601 base with 10 kPa/kg piston (to characterize product -20 to 50°C)
	(0 to 55) psi	[0.0000082 % of rdg]^2 + 0.00011 % + 0.000057 psi	
	(0 to 145) psi	[0.0000026 % of rdg]^2 + 0.0013 % + 0.00043 psi	DHI PG7601 base with 100 kPa/kg piston (to characterize product -20 to 50°C)
	(145 to 550) psi	[0.0000010 % of rdg]^2 + 0.00069 % + 0.052 psi	
	(0 to 1450) psi	[0.00000019 % of rdg]^2 + 0.00014 % + 0.0039 psi	DHI PG 7202 base with 200 kPa/kg piston (to characterize product -20 to 50°C)
	(1450 to 3000) psi	[0.00000017 % of rdg]^2 + 0.00034 % + 0.056 psi	
	(0 to 15 000) psi	[0.000000024 % of rdg]^2 + 0.0030 % + 0.037 psi	DHI PG7202 base with 1 MPa/kg piston (to characterize product -20 to 50°C)

[1] This laboratory does not normally offer 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] In the statement of CMC, percentages are percentage of reading, unless otherwise indicated.

Accredited Laboratory

A2LA has accredited

CRYSTAL ENGINEERING CORPORATION, AN AMETEK INC. COMPANY

San Luis Obispo, 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/NCSLI Z540-1-1994 and any additional program requirements in the field of calibration. 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 September 2015.

President & CEO
For the Accreditation Council
Certificate Number 2601.01
Valid to September 30, 2017

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