



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

BHD INSTRUMENTATION LTD.  
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CALIBRATION

Valid To: December 31, 2020

Certificate Number: 5037.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations<sup>1,5</sup>:

I. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC <sup>2,3</sup> (±)	Comments
DC Voltage – Generate	(0 to 330) mV (0 to 3.3) V (0 to 33) V (30 to 330) V (100 to 1020) V	14 µV/V + 2.8 µV 7.8 µV/V + 9 µV 8.3 µV/V + 100 µV 14 µV/V + 1500 µV 13 µV/V + 9000 µV	Fluke 5522A
DC Voltage – Measure	200 mV 2 V 20 V 200 V 1000 V  (1050 to 150 000) V	5.4 µV/V + 0.14 µV 3.7 µV/V + 0.60 µV 3.3 µV/V + 6.5 µV 5.3 µV/V + 57 µV 5.3 µV/V + 590 µV  0.15 % + 1 V	Fluke 8508A  High Voltage Inc. DVR-150, Fluke 8508A
DC Current – Generate	(0 to 330) µA (330 to 3.3) mA (3.3 to 33) mA (33 to 330) mA 330 mA to 3 A (3 to 20) A	0.012 % + 0.015 µA 0.0082 % + 0.036 µA 0.082 % + 0.18 µA 0.0092 % + 7.4 µA 0.030 % + 39 µA 0.095 % + 1100 µA	Fluke 5522A

Parameter/Equipment	Range	CMC <sup>2,3</sup> (±)	Comments
DC Current – Measure	200 µA 2 mA 20 mA 200 mA 2 A 20 A	11 µA/A + 0.000 52 µA 12 µA/A + 0.0032 µA 14 µA/A + 0.032 µA 47 µA/A + 0.62 µA 0.018 % + 13 µA 0.042 % + 320 µA	Fluke 8508A
Resistance – Generate	(0 to 11) Ω (11 to 33) Ω (33 to 110) Ω (110 to 330) Ω 330 Ω to 1.1 kΩ (3.3 to 11) kΩ (11 to 33) kΩ (33 to 110) kΩ (110 to 330) kΩ 330 kΩ to 1.1 MΩ (1.1 to 3.3) MΩ (3.3 to 11) MΩ (11 to 33) MΩ (33 to 110) MΩ (110 to 330) MΩ 330 MΩ to 1.1 GΩ  1 kΩ 10 kΩ 100 kΩ 1 MΩ 10 MΩ 100 MΩ 1 GΩ 10 GΩ 100 GΩ 1 TΩ	0.0028 % + 0.000 81 Ω 0.0021 % + 0.0012 Ω 0.0010 % + 0.0025 Ω 0.0021 % + 0.0017 Ω 0.0028 % + 0.000 39 Ω 0.0020 % + 0.043 Ω 0.0023 % + 0.21 Ω 0.0026 % + 0.17 Ω 0.0025 % + 0.85 Ω 0.0018 % + 6.5 Ω 0.0033 % + 31 Ω 0.010 % + 43 Ω 0.017 % + 1.7 kΩ 0.021 % + 24 kΩ 0.41 % + 100 kΩ 0.041 % + 4.8 MΩ  0.000 030 kΩ 0.000 10 kΩ 0.0021 kΩ 0.000 091 MΩ 0.000 77 MΩ 0.0076 MΩ 0.0062 GΩ 0.034 GΩ 0.95 GΩ 0.040 TΩ	Fluke 5522A, IET Labs VRS-100
Resistance – Measure	2 Ω 20 Ω 200 Ω 2 kΩ 20 kΩ 200 kΩ 2 MΩ 20 MΩ 200 MΩ 2 GΩ	20 µΩ/Ω + 5.2 µΩ 9.6 µΩ/Ω + 15 µΩ 8.3 µΩ/Ω + 63 µΩ 7.8 µΩ/Ω + 640 µΩ 7.1 µΩ/Ω + 14 mΩ 8 µΩ/Ω + 52 mΩ 12 µΩ/Ω + 1.6 Ω 20 µΩ/Ω + 100 Ω 0.014 % + 0.95 MΩ 0.14 % + 0.95 MΩ	Fluke 8508A

Parameter/Equipment	Range	CMC <sup>2,3</sup> (±)	Comments
Capacitance – Generate	(220 to 400) pF (0.4 to 1.1) nF (1.1 to 3.3) nF (3.3 to 11) nF (11 to 33) nF (33 to 110) nF (110 to 330) nF (0.33 to 1.1) μF (1.1 to 3.3) μF (3.3 to 11) μF (11 to 33) μF (33 to 110) μF (110 to 330) μF (0.33 to 1.1) mF (1.1 to 3.3) mF (3.3 to 11) mF (11 to 33) mF (33 to 110) mF	0.41 % + 10 pF 0.32 % + 0.10 nF 0.34 % + 0.010 nF 0.018 % + 0.010 nF 0.085 % + 0.10 nF 0.18 % + 0.10 nF 0.17 % + 0.30 nF 0.18 % + 0.0010 μF 0.22 % + 0.0030 μF 0.18 % + 0.010 μF 0.31 % + 0.030 μF 0.34 % + 0.10 μF 0.34 % + 0.30 μF 0.38 % + 0.0010 mF 0.35 % + 0.0030 mF 0.35 % + 0.010 mF 0.57 % + 0.030 mF 0.84 % + 0.10 mF	Fluke 5522A
Electrical Simulation of Thermocouple – Generate & Measure			
Type E	(-250 to -100) °C (-100 to -25) °C (-25 to 350) °C (350 to 650) °C (650 to 1000) °C	0.46 °C 0.28 °C 0.28 °C 0.28 °C 0.30 °C	Fluke 5522A
Type J	(-210 to -100) °C (-100 to -30) °C (-30 to 150) °C (150 to 760) °C (760 to 1200) °C	0.33 °C 0.28 °C 0.28 °C 0.29 °C 0.31 °C	
Type K	(-200 to -100) °C (-100 to -25) °C (-25 to 120) °C (120 to 1000) °C (1000 to 1372) °C	0.36 °C 0.29 °C 0.28 °C 0.32 °C 0.40 °C	
Type T	(-250 to -150) °C (-150 to 0) °C (0 to 120) °C (120 to 400) °C	0.55 °C 0.32 °C 0.28 °C 0.28 °C	

Parameter/Range	Frequency	CMC <sup>2,3</sup> (±)	Comments
AC Voltage – Generate			
(1 to 33) mV	(10 to 45) Hz (0.045 to 10) kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	0.060 % + 0.0060 mV 0.0088 % + 0.0060 mV 0.012 % + 0.0060 mV 0.075 % + 0.0060 mV 0.28 % + 0.012 mV 0.65 % + 0.050 mV	Fluke 5522A
(33 to 330) mV	(10 to 45) Hz (0.045 to 10) kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	0.032 % + 0.0080 mV 0.013 % + 0.0080 mV 0.016 % + 0.0080 mV 0.032 % + 0.0080 mV 0.068 % + 0.032 mV 0.15 % + 0.070 mV	
(0.33 to 3.3) V	(10 to 45) Hz (0.045 to 10) kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	0.033 % + 0.000 050 V 0.011 % + 0.000 060 V 0.014 % + 0.000 060 V 0.028 % + 0.000 050 V 0.076 % + 0.000 13 V 0.20 % + 0.000 60 V	
(3.3 to 33) V	(10 to 45) Hz (0.045 to 10) kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	0.031 % + 0.000 65 V 0.023 % + 0.000 60 V 0.018 % + 0.000 60 V 0.023 % + 0.000 60 V 0.031 % + 0.000 60 V 0.071 % + 0.0016 V	
(33 to 330) V	(10 to 45) Hz (0.045 to 10) kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.015 % + 0.0020 V 0.015 % + 0.0060 V 0.021 % + 0.0060 V 0.026 % + 0.0060 V 0.015 % + 0.050 V	
(330 to 1020) V	(45 to 1000) Hz (1 to 5) kHz (5 to 10) kHz	0.030 % + 0.010 V 0.028 % + 0.010 V 0.027 % + 0.010V	

Parameter/Range	Frequency	CMC <sup>2, 3</sup> (±)	Comments	
AC Voltage – Measure				
200 mV	(10 to 10) Hz (10 to 40) Hz (40 to 100) Hz (100 to 2000) Hz (2 to 10) kHz (30 to 100) kHz	0.016 % + 0.014 mV 0.013 % + 0.0040 mV 0.011 % + 0.0020 mV 0.014 % + 0.0040 mV 0.042 % + 0.0080 mV 0.070 % + 0.020 mV	Fluke 8508A	
2 V	(1 to 10) Hz (10 to 40) Hz (40 to 100) Hz (100 to 2000) Hz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz (100 to 300) kHz (300 to 1000) kHz	0.014 % + 0.00012 V 0.011 % + 0.000 020 V 0.0086 % + 0.000 020 V 0.078 % + 0.000 020 V 0.012 % + 0.000 040 V 0.040 % + 0.000 20 V 0.059 % + 0.0020 V 0.22 % + 0.0020 V 0.79 % + 0.020 V		
20 V	(1 to 10) Hz (10 to 40) Hz (40 to 100) Hz (100 to 2000) Hz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz (100 to 300) kHz (300 to 1000) kHz	0.014 % + 0.0012 V 0.011 % + 0.000 020 V 0.0086 % + 0.000 020 V 0.0078 % + 0.000 020 V 0.0012 % + 0.000 020 V 0.040 % + 0.00040 V 0.059 % + 0.00020 V 0.22 % + 0.0020 V 0.79 % + 0.020 V		
200 V	(1 to 10) Hz (10 to 40) Hz (40 to 100) Hz (100 to 2000) Hz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz	0.014 % + 0.012 V 0.010 % + 0.0020 V 0.009 % + 0.0020 V 0.0079 % + 0.0020 V 0.011 % + 0.0020 V 0.020 % + 0.00040 V 0.050 % + 0.020 V		
1000 V	(1 to 10) Hz (10 to 40) Hz (40 to 10 000) Hz (10 to 30) kHz (30 to 100) kHz	0.015 % + 0.070 V 0.013 % + 0.020 V 0.011 % + 0.0020 V 0.020 % + 0.040 V 0.057 % + 0.20 V		
(1050 to 150 000) V	-----	0.41 % + 0.016 kV		High Voltage Inc. DVR-150, Fluke 8508A

Parameter/Range	Frequency	CMC <sup>2,3</sup> (±)	Comments
AC Current – Generate			
(29 to 330) µA	(10 to 20) Hz (20 to 45) Hz (45 to 1000) Hz (5 to 10) kHz (10 to 30) kHz	0.17 % + 0.10 µA 0.093 % + 0.10 µA 0.23 % + 0.15 µA 0.61 % + 0.20 µA 1.2 % + 0.40 µA	Fluke 5522A
(0.33 to 3.3) mA	(10 to 20) Hz (20 to 45) Hz (45 to 1000) Hz (5 to 10) kHz (10 to 30) kHz	0.16 % + 0.15 µA 0.096 % + 0.15 µA 0.15 % + 0.20 µA 0.39 % + 0.30 µA 0.77 % + 0.60 µA	
(3.3 to 33) mA	(10 to 20) Hz (20 to 45) Hz (45 to 1000) Hz (5 to 10) kHz (10 to 30) kHz	0.15 % + 2.0 µA 0.69 % + 2.0 µA 0.061 % + 0.20 µA 0.15 % + 3 µA 0.31 % + 4 µA	
(33 to 330) mA	(10 to 20) Hz (20 to 45) Hz (45 to 1000) Hz (5 to 10) kHz (10 to 30) kHz	0.14 % + 2.0 µA 0.080 % + 2.0 µA 0.010 % + 5.0 µA 0.18 % + 100 µA 0.32 % + 200 µA	
(0.33 to 3) A	(10 to 45) Hz (45 to 1000) Hz (1 to 5) kHz (5 to 10) kHz	0.16 % + 100 µA 0.057 % + 100 µA 0.46 % + 1000 µA 2.0 % + 5000 µA	
(3 to 20) A	(45 to 100) Hz (1 to 5) kHz (5 to 10) kHz	0.090 % + 0.0050 A 0.12 % + 0.0050 A 2.8 % + 0.0050 A	

Parameter/Range	Frequency	CMC <sup>2, 3</sup> (±)	Comments
AC Current – Measure			
200 µA	(1 to 10) Hz 10 Hz to 10 kHz (10 to 30) kHz (30 to 100) kHz	0.026 % + 0.024 µA 0.023 % + 0.024 µA 0.082 % + 0.024 µA 0.30 % + 0.024 µA	Fluke 8508A
2 mA	(1 to 10) Hz 10 Hz to 10 kHz (10 to 30) kHz (30 to 100) kHz	0.026 % + 0.024 µA 0.024 % + 0.024 µA 0.059 % + 0.024 µA 0.30 % + 0.024 µA	
20 mA	(1 to 10) Hz 10 Hz to 10 kHz (10 to 30) kHz (30 to 100) kHz	0.028 % + 0.024 µA 0.023 % + 0.024 µA 0.059 % + 0.024 µA 0.30 % + 0.024 µA	
200 mA	(1 to 10) Hz 10 Hz to 10 kHz (10 to 30) kHz	0.026 % + 0.024 µA 0.023 % + 0.024 µA 0.055 % + 0.024 µA	
2 A	(1 to 10) Hz 10 Hz to 10 kHz (10 to 30) kHz	0.052 % + 0.024 µA 0.075 % + 0.024 µA 0.28 % + 0.024 µA	
20 A	10 Hz to 20 kHz (20 to 100) kHz	0.067 % + 0.024 µA 0.021 % + 0.024 µA	

## II. Mechanical

Parameter/Equipment	Range	CMC <sup>2, 4</sup> (±)	Comments
Pneumatic Pressure – Generate & Measure	Up to 15 kPa Up to 350 kPa	0.0082 % + 0.000 10 kPa 0.0094 % + 0.000 76 kPa	DHI PPC4
	Up to 7 MPa	0.0091 % + 0.020 kPa	DHI PPC3
Hydraulic Pressure – Generate & Measure	Up to 112 MPa	0.0032 % + 0.000 036 MPa	DHI PG7302-2
	Up to 280 MPa	0.0034 % + 0.000 067 MPa	DHI PG7302-5

### III. Time & Frequency

Parameter/Equipment	Frequency	CMC <sup>2,3</sup> ( $\pm$ )	Comments
Frequency – Measuring Equipment	(0.01 to 120) Hz (120 to 1200) Hz (1.2 to 12) kHz (12 to 120) kHz (120 to 1200) kHz (1.2 to 2) MHz	0.012 Hz + 5 $\mu$ Hz 0.12 Hz + 5 $\mu$ Hz 0.0012 kHz + 5 $\mu$ Hz 0.12 kHz + 5 $\mu$ Hz 0.12 kHz + 5 $\mu$ Hz 0.0012 MHz + 5 $\mu$ Hz	Fluke 5522A

<sup>1</sup> This laboratory offers commercial calibration service.

<sup>2</sup> 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.

<sup>3</sup> 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.

<sup>4</sup> The type of instrument or material being calibrated is defined by the parameter. This indicates the laboratory is capable of calibrating instruments that measure or generate the values in the ranges indicated for the listed measurement parameter.

<sup>5</sup> This scope meets A2LA's *P112 Flexible Scope Policy*.





## *Accredited Laboratory*

A2LA has accredited

### **BHD INSTRUMENTATION LTD.**

*Edmonton, Alberta, CANADA*

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 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 28<sup>th</sup> of November 2018.

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

President and CEO  
For the Accreditation Council  
Certificate Number 5037.01  
Valid to December 31, 2020

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



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

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CALIBRATION

Valid To: December 31, 2020

Certificate Number: 5037.02

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations<sup>1,5</sup>:

I. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC <sup>2,3</sup> (±)	Comments
DC Voltage – Generate	(0 to 330) mV (0 to 3.3) V (0 to 33) V (30 to 330) V (110 to 1020) V	38 $\mu$ V/V + 2.8 $\mu$ V 23 $\mu$ V/V + 0.01 $\mu$ V 26 $\mu$ V/V + 0.1 $\mu$ V 43 $\mu$ V/V + 1.5 $\mu$ V 10 $\mu$ V/V + 8.9 $\mu$ V	Fluke 5522A
DC Voltage – Measure	200 mV 2 V 20 V 200 V 1000 V	10 $\mu$ V/V + 0.14 $\mu$ V 1.3 $\mu$ V/V + 0.50 $\mu$ V 3.6 $\mu$ V/V + 3.3 $\mu$ V 5.5 $\mu$ V/V + 33 $\mu$ V 5.5 $\mu$ V/V + 400 $\mu$ V	Fluke 8508A
DC Current – Generate	(0 to 330) $\mu$ A 330 $\mu$ A to 3.3 mA (3.3 to 33) mA (33 to 330) mA 330 mA to 3) A (3 to 20) A	0.012 % + 0.14 $\mu$ A 0.007 % + 0.19 $\mu$ A 0.0077 % + 1.7 $\mu$ A 0.0076 % + 17 $\mu$ A 0.037 % + 200 $\mu$ A 0.081 % + 9100 $\mu$ A	Fluke 5522A



Parameter/Equipment	Frequency	CMC <sup>2,3</sup> (±)	Comments
Capacitance – Generate	(220 to 400) pF (0.4 to 1.1) nF (1.1 to 3.3) nF (3.3 to 11) nF (11 to 33) nF (33 to 110) nF (110 to 330) nF (0.33 to 1.1) μF (1.1 to 3.3) μF (3.3 to 11) μF (11 to 33) μF (33 to 110) μF (110 to 330) μF (0.33 to 1.1) mF (1.1 to 3.3) mF (3.3 to 11) mF (11 to 33) mF (33 to 110) mF	0.23 % + 10 pF 0.16 % + 0.010 nF 0.34 % + 0.010 nF 0.18 % + 0.010 nF 0.08 % + 0.10 nF 0.18 % + 0.10 nF 0.17 % + 0.30 nF 0.18 % + 0.0010 μF 0.22 % + 0.0030 μF 0.18 % + 0.010 μF 0.31 % + 0.030 μF 0.34 % + 0.10 μF 0.34 % + 0.30 μF 0.38 % + 0.0010 mF 0.35 % + 0.0030 mF 0.35 % + 0.010 mF 0.57 % + 0.030 mF 0.84 % + 0.10 mF	Fluke 5522A
Electrical Simulation of Thermocouple – Generate & Measure			
Type E	(-250 to -100) °C (-100 to -25) °C (-25 to 350) °C (350 to 650) °C (650 to 1000) °C	0.41 °C 0.19 °C 0.17 °C 0.18 °C 0.24 °C	Fluke 5522A
Type J	(-210 to -100) °C (-100 to -30) °C (-30 to 150) °C (150 to 760) °C (760 to 1200) °C	0.26 °C 0.19 °C 0.18 °C 0.19 °C 0.22 °C	
Type K	(-200 to -100) °C (-100 to -25) °C (-25 to 120) °C (120 to 1000) °C (1000 to 1372) °C	0.30 °C 0.21 °C 0.20 °C 0.27 °C 0.35 °C	
Type T	(-250 to -150) °C (-150 to 0) °C (0 to 120) °C (120 to 400) °C	0.51 °C 0.23 °C 0.18 °C 0.17 °C	

Parameter/Range	Frequency	CMC <sup>2,3</sup> (±)	Comments
AC Voltage – Generate			
(1 to 33) mV	(10 to 45) Hz (0.045 to 10) kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	0.058 % + 0.0060 mV 0.0087 % + 0.0060 mV 0.013 % + 0.0060 mV 0.076 % + 0.0060 mV 0.29 % + 0.012 mV 0.62 % + 0.050 mV	Fluke 5522A
(33 to 330) mV	(10 to 45) Hz (0.045 to 10) kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	0.023 % + 0.0080 mV 0.012 % + 0.0080 mV 0.012 % + 0.0080 mV 0.029 % + 0.0080 mV 0.064 % + 0.032 mV 0.16 % + 0.070 mV	
(0.33 to 3.3) V	(10 to 45) Hz (0.045 to 10) kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	0.023 % + 0.000 050 V 0.012 % + 0.000 060 V 0.016 % + 0.000 060 V 0.031 % + 0.000 050 V 0.084 % + 0.000 13 V 0.19 % + 0.000 60 V	
(3.3 to 33) V	(10 to 45) Hz (0.045 to 10) kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.023 % + 0.000 65 mV 0.014 % + 0.000 60 mV 0.019 % + 0.000 60 mV 0.027 % + 0.000 60 mV 0.069 % + 0.0016 mV	
(33 to 330) V	(10 to 45) Hz (0.045 to 10) kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.016 % + 0.0020 V 0.017 % + 0.0060 V 0.023 % + 0.0060 V 0.025 % + 0.0060 V 0.16 % + 0.050 V	
(330 to 1020) V	(45 to 1000) Hz (1 to 5) kHz (5 to 10) kHz	0.025 % + 0.010 V 0.019 % + 0.010 V 0.023 % + 0.010V	

Parameter/Range	Frequency	CMC <sup>2,3</sup> (±)	Comments
AC Voltage – Measure			
200 mV	(10 to 40) Hz (40 to 100) Hz (100 to 2000) Hz (2 to 10) kHz (30 to 100) kHz	0.003 % + 0.0140 mV 0.011 % + 0.0040 mV 0.010 % + 0.0020 mV 0.013 % + 0.0040 mV 0.083 % + 0.0080 mV	Fluke 8508A
2 V	(10 to 40) Hz (40 to 100) Hz (100 to 2000) Hz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz (300 to 1000) kHz	0.0037 % + 0.000 12 mV 0.0090 % + 0.000 020 mV 0.0070 % + 0.000 020 mV 0.0012 % + 0.000 020 V 0.040 % + 0.000 040 mV 0.058 % + 0.000 20 mV 2.5 % + 0.0020 V	
20 V	(10 to 40) Hz (40 to 100) Hz (100 to 2000) Hz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz (300 to 1000) kHz	0.00042 % + 0.0012 mV 0.009 % + 0.000 20 mV 0.0070 % + 0.000 20 mV 0.0012 % + 0.000 20 V 0.040 % + 0.000 40 mV 0.058 % + 0.0020 mV 1.2 % + 0.20 V	
200 V	(10 to 40) Hz (40 to 100) Hz (100 to 2000) Hz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz	0.0010 % + 0.012 mV 0.009 % + 0.0020 mV 0.0074 % + 0.0020 V 0.011 % + 0.0020 mV 0.020 % + 0.000 40 mV 0.049 % + 0.020 V	
1000 V	(1 to 10) Hz (10 to 40) Hz (40 to 10 000) Hz (10 to 30) kHz (30 to 100) kHz	0.006 % + 0.070 V 0.011 % + 0.020 V 0.011 % + 0.0020 V 0.010 % + 0.040 V 0.006 % + 0.20 V	

Parameter/Range	Frequency	CMC <sup>2,3</sup> (±)	Comments
AC Current – Generate			
(29 to 330) µA	(10 to 20) Hz (20 to 45) Hz (45 to 1000) Hz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.18 % + 0.10 µA 0.11 % + 0.10 µA 0.096 % + 0.10 µA 0.25 % + 0.15 µA 0.61 % + 0.20 µA 1.2 % + 0.40 µA	Fluke 5522A
(0.33 to 3.3) mA	(10 to 20) Hz (20 to 45) Hz (45 to 1000) Hz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.17 % + 0.15 µA 0.096 % + 0.15 µA 0.077 % + 0.15 µA 0.15 % + 0.20 µA 0.39 % + 0.30 µA 0.77 % + 0.60 µA	
(3.3 to 33) mA	(10 to 20) Hz (20 to 45) Hz (45 to 1000) Hz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.15 % + 2.0 µA 0.069 % + 2.0 µA 0.030 % + 2.0 µA 0.061 % + 0.20 µA 0.15 % + 3.0 µA 0.31 % + 4.0 µA	
33 to 330 mA	(10 to 20) Hz (20 to 45) Hz (45 to 1000) Hz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.15 % + 2.0 µA 0.069 % + 2.0 µA 0.030 % + 2.0 µA 0.07 % + 5.0 µA 0.15 % + 100 µA 0.30 % + 200 µA	
0.33 to 3 A	(10 to 45) Hz (45 to 1000) Hz (1 to 5) kHz (5 to 10) kHz	0.14 % + 100 µA 0.046 % + 100 µA 0.46 % + 1000 µA 2.0 % + 5000 µA	
3 to 20 A	(45 to 100) Hz (1 to 5) kHz (5 to 10) kHz	0.090 % + 0.0050 A 0.12 % + 0.0050 A 2.4 % + 0.0050 A	

Parameter/Range	Frequency	CMC <sup>2,3</sup> (±)	Comments
AC Current – Measure			
200 µA	(10 to 5000) Hz	0.042 % + 0.024 µA	Fluke 8508A
2 mA	(10 to 10 000) Hz (10 to 30) kHz	0.021 % + 0.024 µA 0.06 % + 0.24 µA	
20 mA	(10 to 10 000) Hz (10 to 30) kHz	0.025 % + 2.4 µA 0.05 % + 2.4 µA	
200 mA	(10 to 10 000) Hz (10 to 30) kHz	0.024 % + 24 µA 0.049 % + 24 µA	
2 A	(10 to 2000) Hz (2 to 10) kHz	0.050 % + 240 µA 0.23 % + 240 µA	
20 A	(10 to 2000) Hz (2 to 10) kHz	0.065 % + 2400 µA 0.24 % + 2400 µA	

## II. Mechanical

Parameter/Equipment	Range	CMC <sup>2,4</sup> (±)	Comments
Pneumatic Pressure – Generate & Measure	Up to 350 kPa Up to 7 MPa	0.0086% + 3.8 Pa 0.0089% + 31 Pa	DHI PPC4

## III. Time & Frequency

Parameter/Equipment	Range	CMC <sup>2,3</sup> (±)	Comments
Frequency – Measuring Equipment	(0.01 to 120) Hz (120 to 1200) Hz (1.2 to 12) kHz (12 to 120) kHz (120 to 1200) kHz (1.2 to 2) MHz	0.012 Hz + 5 µHz 0.12 Hz + 5 µHz 0.0012 kHz + 5 µHz 0.12 kHz + 5 µHz 0.12 kHz + 5 µHz 0.0012 MHz + 5 µHz	Fluke 5522A

<sup>1</sup> This laboratory offers commercial and field calibration service.



- <sup>2</sup> 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.
- <sup>3</sup> 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.
- <sup>4</sup> The type of instrument or material being calibrated is defined by the parameter. This indicates the laboratory is capable of calibrating instruments that measure or generate the values in the ranges indicated for the listed measurement parameter.
- <sup>5</sup> This scope meets A2LA's *P112 Flexible Scope Policy*.



## *Accredited Laboratory*

A2LA has accredited

### **BHD INSTRUMENTATION LTD.**

*Richmond, British Columbia, CANADA*

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 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 5<sup>th</sup> of December 2018.

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

President and CEO  
For the Accreditation Council  
Certificate Number 5037.02  
Valid to December 31, 2020

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