



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017  
& ANSI/NCSL Z540-1-1994

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CALIBRATION

Valid To: November 30, 2024

Certificate Number: 3601.02

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations<sup>1, 8</sup>:

I. Dimensional

| Parameter/Equipment        | Range                        | CMC <sup>2, 6</sup> (±) | Comments                                    | Location <sup>9</sup> |
|----------------------------|------------------------------|-------------------------|---------------------------------------------|-----------------------|
| Micrometers                | Up to 12 in<br>(12 to 40) in | 80 µin<br>590 µin       | Gage blocks                                 | BC                    |
| Calipers                   | Up to 40 in                  | 300 µin                 | Gage blocks                                 | BC                    |
| Length & Travel Indicators | Up to 1 in<br>Up to 6 in     | 26 µin<br>480 µin       | Gage blocks & granite surface plate         | BC                    |
| Height Gages               | Up to 24 in                  | 480 µin                 | Gage blocks & granite surface plate         | BC                    |
| Micrometer Standards       | Up to 10 in<br>(10 to 40) in | 35 µin<br>82 µin        | P&W Model C Supermic™ & Grade 0 gage blocks | BC                    |

## II. Electrical DC/Low Frequency

| Parameter/Equipment                   | Range                                                                                                       | CMC <sup>2,4</sup> ( $\pm$ )                                                                                                                                                              | Comments          | Location <sup>9</sup> |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------------|
| DC Voltage –<br>Generate <sup>3</sup> | (0 to 329.9999) mV<br>(0 to 3.299 999) V<br>(0 to 32.999 99) V<br>(30 to 329.9999) V<br>(100 to 1020) V     | 51 $\mu$ V/V + 2.3 $\mu$ V<br>38 $\mu$ V/V + 3.9 $\mu$ V<br>38 $\mu$ V/V + 39 $\mu$ V<br>44 $\mu$ V/V + 390 $\mu$ V<br>45 $\mu$ V/V + 1200 $\mu$ V                                        | Fluke 5502A       | BC                    |
| DC Current –<br>Generate <sup>3</sup> | Up to 330 $\mu$ A<br>(0.33 to 3.3) mA<br>(3.3 to 33) mA<br>(33 to 330) mA<br>(0.33 to 3) A<br>(3 to 20.5) A | 140 $\mu$ A/A + 0.016 $\mu$ A<br>110 $\mu$ A/A + 0.039 $\mu$ A<br>82 $\mu$ A/A + 0.19 $\mu$ A<br>100 $\mu$ A/A + 1.9 $\mu$ A<br>300 $\mu$ A/A + 34 $\mu$ A<br>870 $\mu$ A/A + 580 $\mu$ A | Fluke 5502A       | BC                    |
| DC Voltage –<br>Measure <sup>3</sup>  | Up to 100 mV<br>(0.1 to 1) V<br>(1 to 10) V<br>(10 to 100) V<br>(100 to 1050) V                             | 8.0 $\mu$ V/V + 0.30 $\mu$ V<br>7.3 $\mu$ V/V + 0.30 $\mu$ V<br>7.0 $\mu$ V/V + 0.5 $\mu$ V<br>9.4 $\mu$ V/V + 30 $\mu$ V<br>13 $\mu$ V/V + 100 $\mu$ V                                   | Keysight<br>3458A | BC                    |
| DC Current –<br>Measure <sup>3</sup>  | Up to 100 $\mu$ A<br>(0.1 to 1) mA<br>(1 to 10) mA<br>(10 to 100) mA<br>(0.1 to 1) A                        | 35 $\mu$ A/A + 0.000 80 $\mu$ A<br>18 $\mu$ A/A + 0.0050 $\mu$ A<br>20 $\mu$ A/A + 0.050 $\mu$ A<br>36 $\mu$ A/A + 0.50 $\mu$ A<br>100 $\mu$ A/A + 10 $\mu$ A                             | Keysight<br>3458A | BC                    |

| Parameter/Range                       | Frequency                                                                                                   | CMC <sup>2,4</sup> (±)                                                                                                                         | Comments       | Location <sup>9</sup> |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------------|
| AC Voltage –<br>Generate <sup>3</sup> |                                                                                                             |                                                                                                                                                |                |                       |
| Up to 33 mV                           | (10 to 45) Hz<br>45 Hz to 10 kHz<br>(10 to 20) kHz<br>(20 to 50) kHz<br>(50 to 100) kHz<br>(100 to 500) kHz | 0.12 % + 0.016 mV<br>0.078 % + 0.016 mV<br>0.12 % + 0.016 mV<br>0.16 % + 0.016 mV<br>0.31 % + 0.026 mV<br>0.84 % + 0.047 mV                    | Fluke<br>5502A | BC                    |
| (33 to 330) mV                        | (10 to 45) Hz<br>45 Hz to 10 kHz<br>(10 to 20) kHz<br>(20 to 50) kHz<br>(50 to 100) kHz<br>(100 to 500) kHz | 0.048 % + 0.016 mV<br>0.024 % + 0.016 mV<br>0.055 % + 0.016 mV<br>0.080 % + 0.016 mV<br>0.18 % + 0.13 mV<br>0.41 % + 0.26 mV                   |                |                       |
| (0.33 to 3.3) V                       | (10 to 45) Hz<br>45 Hz to 10 kHz<br>(10 to 20) kHz<br>(20 to 50) kHz<br>(50 to 100) kHz<br>(100 to 500) kHz | 0.045 % + 0.000 047 V<br>0.024 % + 0.000 047 V<br>0.055 % + 0.000 047 V<br>0.078 % + 0.000 047 V<br>0.19 % + 0.000 16 V<br>0.41 % + 0.000 70 V |                |                       |
| (3.3 to 33) V                         | (10 to 45) Hz<br>45 Hz to 10 kHz<br>(10 to 20) kHz<br>(20 to 50) kHz<br>(50 to 100) kHz                     | 0.045 % + 0.000 62 V<br>0.027 % + 0.000 47 V<br>0.055 % + 0.000 47 V<br>0.078 % + 0.000 47 V<br>0.18 % + 0.0016 V                              |                |                       |
| (33 to 330) V                         | 45 Hz to 1 kHz<br>(1 to 10) kHz<br>(10 to 20) kHz<br>(20 to 50) kHz<br>(50 to 100) kHz                      | 0.039 % + 0.0023 V<br>0.061 % + 0.0070 V<br>0.071 % + 0.0070 V<br>0.10 % + 0.0070 V<br>0.19 % + 0.062 V                                        |                |                       |
| (330 to 1000) V                       | 45 Hz to 1 kHz<br>(1 to 5) kHz<br>(5 to 10) kHz                                                             | 0.039 % + 0.016 V<br>0.062 % + 0.016 V<br>0.070 % + 0.016 V                                                                                    |                |                       |

| Parameter/Range                   | Frequency                                                                                                                                                                    | CMC <sup>2, 4</sup> (±)                                                                                                                                                                                                                 | Comments          | Location <sup>9</sup> |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------------|
| AC Voltage – Measure <sup>3</sup> |                                                                                                                                                                              |                                                                                                                                                                                                                                         |                   |                       |
| Up to 100 mV                      | (10 to 40) Hz<br>40 Hz to 1 kHz<br>(1 to 20) kHz<br>(20 to 50) kHz<br>(50 to 100) kHz<br>(100 to 300 kHz)<br>(0.3 to 1) MHz<br>(1 to 4) MHz<br>(4 to 8) MHz<br>(8 to 10) MHz | 0.0072 % + 0.0048 mV<br>0.0096 % + 0.0024 mV<br>0.017 % + 0.0024 mV<br>0.031 % + 0.0024 mV<br>0.092 % + 0.0024 mV<br>0.41 % + 0.012 mV<br>1.3 % + 0.012 mV<br>4.1 % + 0.084 mV<br>4.2 % + 0.096 mV<br>15 % + 0.12 mV                    | Keysight<br>3458A | BC                    |
| (0.1 to 1) V                      | (10 to 40) Hz<br>40 Hz to 1 kHz<br>(1 to 20) kHz<br>(20 to 50) kHz<br>(50 to 100) kHz<br>(100 to 300 kHz)<br>(0.3 to 1) MHz<br>(1 to 4) MHz<br>(4 to 8) MHz<br>(8 to 10) MHz | 0.0082 % + 0.000 048 V<br>0.0086% + 0.000 024 V<br>0.016 % + 0.000 024 V<br>0.036 % + 0.000 024 V<br>0.079 % + 0.000 024 V<br>0.32 % + 0.000 12 V<br>0.99 % + 0.000 12 V<br>4.0 % + 0.000 84 V<br>4.1 % + 0.000 96 V<br>15 % + 0.0012 V |                   |                       |
| (1 to 10) V                       | (10 to 40) Hz<br>40 Hz to 1 kHz<br>(1 to 20) kHz<br>(20 to 50) kHz<br>(50 to 100) kHz<br>(100 to 300 kHz)<br>(0.3 to 1) MHz<br>(1 to 4) MHz<br>(4 to 8) MHz<br>(8 to 10) MHz | 0.016 % + 0.000 48 V<br>0.0086% + 0.000 24 V<br>0.016 % + 0.000 24 V<br>0.033 % + 0.000 24 V<br>0.082 % + 0.000 24 V<br>0.32 % + 0.0012 V<br>0.99 % + 0.0012 V<br>4.0 % + 0.0084 V<br>4.0 % + 0.0096 V<br>15 % + 0.012 V                |                   |                       |
| (10 to 100) V                     | (10 to 40) Hz<br>40 Hz to 1 kHz<br>(1 to 20) kHz<br>(20 to 50) kHz<br>(50 to 100) kHz                                                                                        | 0.020 % + 0.0048 V<br>0.021% + 0.0024 V<br>0.022 % + 0.0024 V<br>0.036 % + 0.0024 V<br>0.12 % + 0.0024 V                                                                                                                                |                   |                       |
| (100 to 750) V                    | (10 to 40) Hz<br>40 Hz to 1 kHz<br>(1 to 20) kHz<br>(20 to 50) kHz<br>(50 to 100) kHz                                                                                        | 0.041 % + 0.040 V<br>0.047 % + 0.020 V<br>0.063 % + 0.020 V<br>0.12 % + 0.020 V<br>0.30 % + 0.020 V                                                                                                                                     |                   |                       |

| Parameter/Range                   | Frequency                                                                                           | CMC <sup>2, 4</sup> ( $\pm$ )                                                                                                                     | Comments    | Location <sup>9</sup> |
|-----------------------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------------------|
| AC Voltage – Measure <sup>3</sup> |                                                                                                     |                                                                                                                                                   |             |                       |
| (29 to 330) $\mu$ A               | (10 to 20) Hz<br>(20 to 45) Hz<br>45 Hz to 1 kHz<br>(1 to 5) kHz<br>(5 to 10) kHz<br>(10 to 30) kHz | 0.33% + 0.10 $\mu$ A<br>0.11 % + 0.10 $\mu$ A<br>0.097 % + 0.10 $\mu$ A<br>0.25 % + 0.15 $\mu$ A<br>0.61 % + 0.20 $\mu$ A<br>1.2 % + 0.40 $\mu$ A | Fluke 5502A | BC                    |
| (0.33 to 3.3) mA                  | (10 to 20) Hz<br>(20 to 45) Hz<br>45 Hz to 1 kHz<br>(1 to 5) kHz<br>(5 to 10) kHz<br>(10 to 30) kHz | 0.36 % + 0.000 15 mA<br>0.096 % + 0.000 15 mA<br>0.078 % + 0.000 15 mA<br>0.16 % + 0.000 20 mA<br>0.39 % + 0.000 30 mA<br>0.80 % + 0.000 60 mA    |             |                       |
| (3.3 to 33) mA                    | (10 to 20) Hz<br>(20 to 45) Hz<br>45 Hz to 1 kHz<br>(1 to 5) kHz<br>(5 to 10) kHz<br>(10 to 30) kHz | 0.33 % + 0.0020 mA<br>0.070 % + 0.0020 mA<br>0.030 % + 0.0020 mA<br>0.061 % + 0.0020 mA<br>0.16 % + 0.0030 mA<br>0.32 % + 0.0040 mA               |             |                       |
| (33 to 330) mA                    | (10 to 20) Hz<br>(20 to 45) Hz<br>45 Hz to 1 kHz<br>(1 to 5) kHz<br>(5 to 10) kHz<br>(10 to 30) kHz | 0.30 % + 0.020 mA<br>0.085 % + 0.020 mA<br>0.055 % + 0.020 mA<br>0.073% + 0.050 mA<br>0.16 % + 0.10 mA<br>0.33 % + 0.20 mA                        |             |                       |
| (0.33 to 3) A                     | (10 to 45) Hz<br>45 Hz to 1 kHz<br>(1 to 5) kHz<br>(5 to 10) kHz                                    | 0.14 % + 0.000 10 A<br>0.15 % + 0.000 10 A<br>0.47 % + 0.0010 A<br>2.0 % + 0.0050 A                                                               |             |                       |
| (3 to 20.5) A                     | (45 to 100) Hz<br>100 Hz to 1 kHz<br>(1 to 5) kHz                                                   | 0.10 % + 0.0050 A<br>0.16 % + 0.0050 A<br>2.3 % + 0.0050 A                                                                                        |             |                       |

| Parameter/Range                   | Frequency                                                                                                                 | CMC <sup>2, 4</sup> (±)                                                                                                         | Comments          | Location <sup>9</sup> |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------------|
| AC Current – Measure <sup>3</sup> |                                                                                                                           |                                                                                                                                 |                   |                       |
| (Up to 100) µA                    | (10 to 20) Hz<br>(20 to 45) Hz<br>(45 to 100) Hz<br>100 Hz to 5 kHz                                                       | 0.4 % + 0.03 µA<br>0.15 % + 0.03 µA<br>0.06 % + 0.03 µA<br>0.06 % + 0.03 µA                                                     | Keysight<br>3458A | BC                    |
| (0.1 to 1) mA                     | (10 to 20) Hz<br>(20 to 45) Hz<br>(45 to 100) Hz<br>100 Hz to 5 kHz<br>(5 to 20) kHz<br>(20 to 50) kHz<br>(50 to 100) kHz | 0.4 % + 0.3 µA<br>0.15 % + 0.2 µA<br>0.06 % + 0.2 µA<br>0.03 % + 0.2 µA<br>0.06 % + 0.2 µA<br>0.4 % + 0.4 µA<br>0.55 % + 1.5 µA |                   |                       |
| (1 to 10) mA                      | (10 to 20) Hz<br>(20 to 45) Hz<br>(45 to 100) Hz<br>100 Hz to 5 kHz<br>(5 to 20) kHz<br>(20 to 50) kHz<br>(50 to 100) kHz | 0.4 % + 0.3 µA<br>0.15 % + 0.3 µA<br>0.06 % + 0.3 µA<br>0.03 % + 0.2 µA<br>0.06 % + 0.2 µA<br>0.4 % + 0.4 µA<br>0.55 % + 1.5 µA |                   |                       |
| (10 to 100) mA                    | (10 to 20) Hz<br>(20 to 45) Hz<br>(45 to 100) Hz<br>100 Hz to 5 kHz<br>(5 to 20) kHz<br>(20 to 50) kHz<br>(50 to 100) kHz | 0.4 % + 3 µA<br>0.15 % + 3 µA<br>0.06 % + 3 µA<br>0.03 % + 2 µA<br>0.06 % + 2 µA<br>0.4 % + 4 µA<br>0.55 % + 15 µA              |                   |                       |
| (0.1 to 1) A                      | (10 to 20) Hz<br>(20 to 45) Hz<br>(45 to 100) Hz<br>100 Hz to 5 kHz<br>(5 to 20) kHz<br>(20 to 50) kHz                    | 0.4 % + 0.2 mA<br>0.16 % + 0.2 mA<br>0.08 % + 0.2 mA<br>0.1 % + 0.2 mA<br>0.3 % + 0.2 mA<br>1 % + 0.4 mA                        |                   |                       |

| Parameter/Equipment                                                                          | Range                                                                                                                                                                                                                                                                                                                                                                                                                                               | CMC <sup>2,4</sup> ( $\pm$ )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Comments          | Location <sup>9</sup> |
|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------------|
| Resistance –<br>Generate <sup>3</sup>                                                        | Up to 11 $\Omega$<br>(11 to 33) $\Omega$<br>(33 to 110) $\Omega$<br>(110 to 330) $\Omega$<br>(0.33 to 1.1) k $\Omega$<br>(1.1 to 3.3) k $\Omega$<br>(3.3 to 11) k $\Omega$<br>(11 to 33) k $\Omega$<br>(33 to 110) k $\Omega$<br>(110 to 330) k $\Omega$<br>(0.33 to 1.1) M $\Omega$<br>(1.1 to 3.3) M $\Omega$<br>(3.3 to 11) M $\Omega$<br>(11 to 33) M $\Omega$<br>(33 to 110) M $\Omega$<br>(110 to 330) M $\Omega$<br>(330 to 1100) M $\Omega$ | 0.017 % + 0.000 78 $\Omega$<br>0.014 % + 0.0012 $\Omega$<br>0.0076 % + 0.0011 $\Omega$<br>0.0075 % + 0.0016 $\Omega$<br>0.0073 % + 0.000 0016 k $\Omega$<br>0.0071 % + 0.000 016 k $\Omega$<br>0.0070 % + 0.000 016 k $\Omega$<br>0.0071 % + 0.00016 k $\Omega$<br>0.0088 % + 0.000 16 k $\Omega$<br>0.0095 % + 0.0016 k $\Omega$<br>0.012 % + 0.000 0016 M $\Omega$<br>0.014 % + 0.000 023 M $\Omega$<br>0.057 % + 0.000 039 M $\Omega$<br>0.12 % + 0.0019 M $\Omega$<br>0.53 % + 0.0023 M $\Omega$<br>1.1 % + 0.078 M $\Omega$<br>3.2 % + 0.39 M $\Omega$ | Fluke 5502A       | BC                    |
| Resistance –<br>Measure <sup>3</sup>                                                         | Up to 10) $\Omega$<br>(10 to 100) $\Omega$<br>(0.1 to 1) k $\Omega$<br>(1 to 10) k $\Omega$<br>(10 to 100) k $\Omega$<br>(0.1 to 1) M $\Omega$<br>(1 to 10) M $\Omega$<br>(10 to 100) M $\Omega$<br>(0.1 to 1) G $\Omega$<br>(10 to 100) M $\Omega$<br>(0.1 to 1) G $\Omega$                                                                                                                                                                        | 17 $\mu\Omega/\Omega$ + 0.000 050 $\Omega$<br>15 $\mu\Omega/\Omega$ + 0.000 50 $\Omega$<br>18 $\mu\Omega/\Omega$ + 0.000 000 50 k $\Omega$<br>14 $\mu\Omega/\Omega$ + 0.000 0050 k $\Omega$<br>14 $\mu\Omega/\Omega$ + 0.000 050 k $\Omega$<br>220 $\mu\Omega/\Omega$ + 0.000 0020 M $\Omega$<br>180 $\mu\Omega/\Omega$ + 0.000 10 M $\Omega$<br>0.087 % + 0.0010 M $\Omega$<br>0.41 % + 0.000 010 G $\Omega$<br>0.087 % + 0.0010 M $\Omega$<br>0.41 % + 0.000 010 G $\Omega$                                                                               | Keysight<br>3458A | BC                    |
| Electrical Calibration<br>of Thermocouple<br>Indicators <sup>3</sup> –<br>Generate & Measure |                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |                       |
| Type B                                                                                       | (600 to 800) $^{\circ}\text{C}$<br>(800 to 1000) $^{\circ}\text{C}$<br>(1000 to 1550) $^{\circ}\text{C}$<br>(1550 to 1820) $^{\circ}\text{C}$                                                                                                                                                                                                                                                                                                       | 0.44 $^{\circ}\text{C}$<br>0.36 $^{\circ}\text{C}$<br>0.32 $^{\circ}\text{C}$<br>0.35 $^{\circ}\text{C}$                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Fluke<br>5502A    | BC                    |
| Type C                                                                                       | (0 to 150) $^{\circ}\text{C}$<br>(150 to 650) $^{\circ}\text{C}$<br>(650 to 1000) $^{\circ}\text{C}$<br>(1000 to 1800) $^{\circ}\text{C}$<br>(1800 to 2316) $^{\circ}\text{C}$                                                                                                                                                                                                                                                                      | 0.30 $^{\circ}\text{C}$<br>0.27 $^{\circ}\text{C}$<br>0.31 $^{\circ}\text{C}$<br>0.44 $^{\circ}\text{C}$<br>0.70 $^{\circ}\text{C}$                                                                                                                                                                                                                                                                                                                                                                                                                         |                   |                       |

| Parameter/Equipment                                                                        | Range                                                                                             | CMC <sup>2</sup> (±)                                | Comments    | Location <sup>9</sup> |
|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-----------------------------------------------------|-------------|-----------------------|
| Electrical Calibration of Thermocouple Indicators <sup>3</sup> – Generate & Measure (cont) |                                                                                                   |                                                     |             |                       |
| Type E                                                                                     | (-250 to -100) °C<br>(-100 to -25) °C<br>(-25 to 350) °C<br>(350 to 650) °C<br>(650 to 1000) °C   | 0.43 °C<br>0.20 °C<br>0.19 °C<br>0.20 °C<br>0.23 °C | Fluke 5502A | BC                    |
| Type J                                                                                     | (-210 to -100) °C<br>(-100 to -30) °C<br>(-30 to 150) °C<br>(150 to 760) °C<br>(760 to 1200) °C   | 0.26 °C<br>0.18 °C<br>0.17 °C<br>0.21 °C<br>0.24 °C |             |                       |
| Type K                                                                                     | (-200 to -100) °C<br>(-100 to -25) °C<br>(-25 to 120) °C<br>(120 to 1000) °C<br>(1000 to 1372) °C | 0.33 °C<br>0.20 °C<br>0.21 °C<br>0.25 °C<br>0.37 °C |             |                       |
| Type N                                                                                     | (-200 to -100) °C<br>(-100 to -25) °C<br>(-25 to 120) °C<br>(120 to 410) °C<br>(410 to 1300) °C   | 0.40 °C<br>0.25 °C<br>0.22 °C<br>0.21 °C<br>0.27 °C |             |                       |
| Type R                                                                                     | (0 to 250) °C<br>(250 to 400) °C<br>(400 to 1000) °C<br>(1000 to 1767) °C                         | 0.51 °C<br>0.37 °C<br>0.34 °C<br>0.38 °C            |             |                       |
| Type S                                                                                     | (0 to 250) °C<br>(250 to 1000) °C<br>(1000 to 1400) °C<br>(1400 to 1767) °C                       | 0.46 °C<br>0.36 °C<br>0.37 °C<br>0.44 °C            |             |                       |
| Type T                                                                                     | (-250 to -150) °C<br>(-150 to 0) °C<br>(0 to 120) °C<br>(120 to 400) °C                           | 0.52 °C<br>0.24 °C<br>0.18 °C<br>0.20 °C            |             |                       |

| Parameter/Equipment                                                                       | Range                                                                                                                              | CMC <sup>2</sup> (±)                                                          | Comments        | Location <sup>9</sup> |
|-------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|-----------------|-----------------------|
| Electrical Calibration of<br>RTD Indicators <sup>3</sup> –<br>Generate<br><br>Pt385, 100° | <br>(-200 to -80) °C<br>(-80 to 0) °C<br>(0 to 100) °C<br>(100 to 300) °C<br>(300 to 400) °C<br>(400 to 630) °C<br>(630 to 800) °C | <br>0.07 °C<br>0.07 °C<br>0.10 °C<br>0.13 °C<br>0.15 °C<br>0.17 °C<br>0.33 °C | <br>Fluke 5502A | <br>BC                |

### III. Mechanical

| Parameter/Equipment              | Range               | CMC <sup>2</sup> (±) | Comments                                  | Location <sup>9</sup>        |
|----------------------------------|---------------------|----------------------|-------------------------------------------|------------------------------|
| Scales & Balances <sup>3</sup>   | (5 to 500) mg       | 5.9 µg               | Class 1 weights                           | BC, TEX,<br>SPR, NVL,<br>ALX |
|                                  | (1 to 100) g        | 6 µg                 |                                           |                              |
|                                  | (1 to 10) kg        | 0.029 g              |                                           |                              |
|                                  | (10 to 150) kg      | 0.030 g              |                                           |                              |
|                                  | (1/32 to 8) oz      | 0.0006 oz            | ASTM Class 5<br>(NIST Class F)<br>weights | BC, TEX,<br>SPR, NVL,<br>ALX |
|                                  | (1 to 20) g         | 0.6 mg               |                                           |                              |
|                                  | (20 to 50) g        | 0.9 mg               |                                           |                              |
|                                  | (50 to 200) g       | 5.2 mg               |                                           |                              |
|                                  | (200 to 1000) g     | 8.9 mg               |                                           |                              |
|                                  | (1 to 5) kg         | 2.9 g                | Class F test cart<br>& weight blocks      | BC, TEX,<br>SPR, NVL,<br>ALX |
| Truck & Rail Scales <sup>3</sup> | (1 to 25) lb        | 0.0006 lb            |                                           |                              |
|                                  | (25 to 50) lb       | 0.0011 lb            |                                           |                              |
|                                  | (50 to 500) lb      | 0.0014 lb            |                                           |                              |
|                                  | (500 to 1000) lb    | 0.06 lb              |                                           |                              |
|                                  | (1000 to 24 000) lb | 0.43 lb              |                                           |                              |
|                                  | (4500 to 30 000) lb | 1.3 lb               |                                           |                              |
|                                  |                     |                      |                                           |                              |
|                                  |                     |                      |                                           |                              |
|                                  |                     |                      |                                           |                              |
|                                  |                     |                      |                                           |                              |

| Parameter/Equipment                         | Range                                                                                                    | CMC <sup>2, 5, 7</sup> ( $\pm$ )                                    | Comments                                               | Location <sup>9</sup> |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|--------------------------------------------------------|-----------------------|
| Torque – Wrenches,<br>Multipliers & Drivers | (2 to 20) inf·oz<br>(5 to 50) lbf·in<br>(50 to 500) lbf·in<br>(25 to 250) lbf·ft<br>(250 to 2500) lbf·ft | 0.03 inf·oz<br>0.2 lbf·in<br>1.9 lbf·in<br>1.3 lbf·ft<br>9.2 lbf·ft | Mountz torque<br>transducers                           | BC                    |
| Pressure – Measure &<br>Measuring Equipment |                                                                                                          |                                                                     |                                                        |                       |
| Hydraulic                                   | (0 to 15 000) psig                                                                                       | 18 psig                                                             | Pressure<br>transducers                                | BC                    |
| Pneumatic                                   | (0 to 1000) psig<br>(0 to 100) psia                                                                      | 0.36 psig<br>0.06 psia                                              |                                                        |                       |
| Accelerometers                              | (7 to 100) Hz<br>100 Hz to 2 kHz<br>(2 to 10) kHz                                                        | 5.4 %<br>1.6 %<br>4.0 %                                             | IMI Sensors<br>699A07 portable<br>vibration calibrator | BC                    |

#### IV. Thermodynamics

| Parameter/Equipment                   | Range                                                                                    | CMC <sup>2, 7</sup> ( $\pm$ )                            | Comments                                                     | Location <sup>9</sup> |
|---------------------------------------|------------------------------------------------------------------------------------------|----------------------------------------------------------|--------------------------------------------------------------|-----------------------|
| Temperature –<br>Measure <sup>3</sup> | (-197 to 0) °C<br>(0 to 157) °C<br>(157 to 232) °C<br>(232 to 420) °C<br>(420 to 660) °C | 0.027 °C<br>0.027 °C<br>0.027 °C<br>0.029 °C<br>0.053 °C | Fluke 9144 field<br>metrology well<br>with<br>Fluke 5609 PRT | BC                    |
|                                       | (-197 to 0) °C<br>(0 to 157) °C<br>(157 to 232) °C<br>(232 to 420) °C                    | 0.017 °C<br>0.017 °C<br>0.017 °C<br>0.026 °C             | Fluke 1502A,<br>5615 PRT                                     | BC                    |
| Temperature –<br>Measuring Equipment  | Up to 50) °C<br>(50 to 200) °C<br>(200 to 420) °C<br>(420 to 550) °C<br>(550 to 660) °C  | 0.15 °C<br>0.11 °C<br>0.14 °C<br>0.17 °C<br>0.2 °C       | Fluke 9144 field<br>metrology well                           | BC                    |
|                                       | (Up to 50) °C<br>(50 to 200) °C<br>(200 to 420) °C<br>(420 to 550) °C<br>(550 to 660) °C | 0.027 °C<br>0.027 °C<br>0.027 °C<br>0.029 °C<br>0.053 °C | Fluke 9144 field<br>metrology well<br>with Fluke 5609<br>PRT | BC                    |

<sup>1</sup> This laboratory offers commercial calibration service 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> Field calibration service is available for this calibration. 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.

<sup>4</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. CMC's 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>5</sup> In the statement of CMC, percent is to be read as percent of reading.

<sup>6</sup> Granite Surface Plate calibration is limited to Local Area Flatness, not Overall Flatness.

<sup>7</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>8</sup> This scope meets A2LA's *P112 Flexible Scope Policy*.

<sup>9</sup> The locations that can perform the calibrations are given by a letter code given in the table below. The field locations below are service locations and all calibrations are performed at customer sites:

| Location                                                             | Code |
|----------------------------------------------------------------------|------|
| (Main Location) 4711 Viking Drive,<br>Bossier City, LA 71111         | BC   |
| (Field Location) 312 Eastland,<br>Texarkana, AR 71854                | TEX  |
| (Field Location) 3086 Coachlite<br>Lane, Springdale, AR 72764        | SPR  |
| (Field Location) 231 Business Park<br>Dr., Box 14, Lebanon, TN 37090 | NVL  |
| (Field Location) 43011 Central<br>Avenue, Alexander, AR 72002        | ALX  |



## Accredited Laboratory

A2LA has accredited

**G.T. MICHELLI COMPANY, INC.**

*Bossier City, LA*

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 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 April 2017).



Presented this 20<sup>th</sup> day of March 2023.

A blue ink signature of Mr. Trace McInturff.

Mr. Trace McInturff, Vice President, Accreditation Services  
For the Accreditation Council  
Certificate Number 3601.02  
Valid to November 30, 2024

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