

# SCOPE OF ACCREDITATION

International Accreditation Service, Inc.

3060 Saturn Street, Suite 100, Brea, California 92821, U.S.A. | [www.iasonline.org](http://www.iasonline.org)

## STANDARD CALIBRATIONS INC

[www.standardcal.com](http://www.standardcal.com)

**Contact Name** Cody DeJong

**Contact Phone** + 1 757-549-6534

**Accredited to** ISO/IEC 17025:2017

**Effective Date** March 29, 2021

### CALIBRATION AND MEASUREMENT CAPABILITY (CMC)\*

| MEASURED<br>QUANTITY or DEVICE<br>TYPE CALIBRATED | RANGE                     | UNCERTAINTY <sup>1,2</sup><br>(±) | CALIBRATION PROCEDURE<br>AND/OR STANDARD<br>EQUIPMENT USED |
|---------------------------------------------------|---------------------------|-----------------------------------|------------------------------------------------------------|
| <b>Dimensional</b>                                |                           |                                   |                                                            |
| Gage Blocks                                       | Up to 13 in               | 16 µin                            | P & W LabMaster, Gage Blocks, Mechanical Comparison        |
| Length                                            | Up to 59 in               | 72 µin                            | Gage Blocks, 717 Gauge Amplifier                           |
| Thread Plugs -Major Diameter                      | Up to Φ2 in               | 47 µin                            | P & W Super Micrometer, Gage Blocks                        |
| Thread Plugs - Pitch Diameter                     | Up to Φ2 in               | 48 µin                            | P & W Super Micrometer, Gage Blocks, Thread Wires          |
| Thread Rings -Minor Diameter                      | Up to Φ4 in               | 63 µin                            | P & W LabMaster, Rings                                     |
| Thread Rings - Pitch Diameter                     | Up to Φ4 in               | 53 µin                            | P & W LabMaster, Rings                                     |
| Plain Rings                                       | Up to Φ8 in               | 43 µin                            | P & W LabMaster, Rings                                     |
| Pin & Plain Plug Gages                            | Up to Φ0.5 in             | 43 µin                            | P & W LabMaster, Gage Blocks                               |
| Inside Micrometers                                | Up to 40 in               | 38 µin                            | Gage Blocks                                                |
| Outside Micrometers                               | Up to 60 in               | 56 µin                            | Gage Blocks                                                |
| Depth Micrometers                                 | Up to 12 in               | 12 µin                            | Gage Blocks                                                |
| Calipers                                          | Up to 40 in               | 38 µin                            | Gage Blocks                                                |
| Dial Indicators                                   | Up to 3 in                | 43 µin                            | P & W Super Micrometer                                     |
| Height Gages                                      | Up to 8 in<br>Up to 40 in | 8 µin<br>33 µin                   | Gage Blocks, 717 Gauge Amplifier                           |
| <b>Mechanical</b>                                 |                           |                                   |                                                            |

\* If information in this CMC is presented in non-SI units, the conversion factors stated in NIST Special Publication 811 "Guide for the Use of the International System of Units (SI)" apply.

# SCOPE OF ACCREDITATION

International Accreditation Service, Inc.

3060 Saturn Street, Suite 100, Brea, California 92821, U.S.A. | [www.iasonline.org](http://www.iasonline.org)

| MEASURED QUANTITY or DEVICE TYPE CALIBRATED                 | RANGE                                                                                                                                                                                                                                                   | UNCERTAINTY <sup>1,2</sup> (±)                                                                                                 | CALIBRATION PROCEDURE AND/OR STANDARD EQUIPMENT USED                                                     |
|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| Torque Wrenches & Torque Cells <sup>5</sup>                 | 5 in·ozf to 50 in·ozf<br>50 in·ozf to 200 in·ozf<br>200 in·ozf to 50 in·lbf<br>50 in·lbf to 400 in·lbf<br>400 in·lbf to 1000 in·lbf<br>1000 in·lbf to 250 ft·lbf<br>250 ft·lbf to 600 ft·lbf<br>600 ft·lbf to 1000 ft·lbf<br>1000 ft·lbf to 2000 ft·lbf | 0.15 in·ozf<br>0.58 in·ozf<br>0.13 in·lbf<br>1.1 in·lbf<br>2.9 in·lbf<br>0.73 ft·lbf<br>1.8 ft·lbf<br>2.9 ft·lbf<br>5.9 ft·lbf | Class F weights, Arms, CDI Torque Calibrator Torque Cell                                                 |
| Pressure Measure and Generate                               | -15 psi to 3000 psi                                                                                                                                                                                                                                     | 0.36 psi                                                                                                                       | PM500-A120K, PM500-G200K, PM500-G700K, PM500-BG100K, PM500-BG2M, PM500-BG7M, PM600-A20M with Fluke 6270A |
|                                                             | 1 psi to 15,000 psi                                                                                                                                                                                                                                     | 1.3 psi                                                                                                                        | Fluke Piston Gauge PG-7202/7601                                                                          |
|                                                             | 15000 psi to 30000 psi                                                                                                                                                                                                                                  | 18 psi                                                                                                                         | Omegadyne PX01S1-30KGI                                                                                   |
| Vacuum Measure and Generate <sup>5</sup>                    | 0 inHg to 29.8 inHg                                                                                                                                                                                                                                     | 0.0036 inHg                                                                                                                    | PM500-BG2M, PM500-BG7M with Fluke 6270A                                                                  |
| Tension/ Compression Dynamometers / Load Cells <sup>5</sup> | 1 lbf to 5 lbf                                                                                                                                                                                                                                          | $7.5 \times 10^{-5} + 0.00053 \text{ lbf}$                                                                                     | Class 6 Weights                                                                                          |
|                                                             | 5 lbf to 20 lbf                                                                                                                                                                                                                                         | $9.3\text{E-}05 + 0.00043 \text{ lbf}$                                                                                         |                                                                                                          |
|                                                             | 20 lbf to 50 lbf<br>50 lbf to 300 lbf                                                                                                                                                                                                                   | $1.9\text{E-}03 + 0.03 \text{ lbf}$<br>$8.0\text{E-}06 + 0.06 \text{ lbf}$                                                     |                                                                                                          |
|                                                             | 300 lbf to 60,000 lbf                                                                                                                                                                                                                                   | $3.3\text{E-}04 + 3.0 \text{ lbf}$                                                                                             | Proving Rings                                                                                            |
| <b>Thermal</b>                                              |                                                                                                                                                                                                                                                         |                                                                                                                                |                                                                                                          |
| Temperature Measure <sup>4</sup>                            | -40 °F to 1220 °F                                                                                                                                                                                                                                       | 0.0092 °F                                                                                                                      | Direct with Fluke 5699 SPRT and Fluke 8508A                                                              |
| Temperature Generate <sup>3</sup>                           | -40 °F to 1220 °F                                                                                                                                                                                                                                       | 0.0092 °F                                                                                                                      | Indirect with Fluke 5699 SPRT and Fluke 8508A                                                            |
| Infrared Temperature Measure <sup>4,5</sup>                 | 122 °F to 932 °F                                                                                                                                                                                                                                        | 0.86 °F                                                                                                                        | Fluke 9132                                                                                               |
| Humidity <sup>5</sup>                                       | 12 %RH to 95 %RH (45 °F to 122 °F)                                                                                                                                                                                                                      | 0.63 %                                                                                                                         | Thunder Scientific 1200                                                                                  |
| <b>Electrical – DC/LF</b>                                   |                                                                                                                                                                                                                                                         |                                                                                                                                |                                                                                                          |
| DC Voltage – Generate <sup>3,5</sup>                        | 0 mV to 199.99 mV<br>0.2 V to 1.9999 V<br>2 V to 19.999 V<br>20 V to 199.99 V<br>200 V to 1050 V                                                                                                                                                        | 1.3 µV<br>8.2 µV<br>83 µV<br>1.3 mV<br>7.0 mV                                                                                  | Fluke 8508A in parallel with a source                                                                    |
| DC Voltage – Measure <sup>4,5</sup>                         | 0 mV to 199.99 mV                                                                                                                                                                                                                                       | 1.3 µV                                                                                                                         | Fluke 8508A                                                                                              |

# SCOPE OF ACCREDITATION

International Accreditation Service, Inc.

3060 Saturn Street, Suite 100, Brea, California 92821, U.S.A. | [www.iasonline.org](http://www.iasonline.org)

| MEASURED<br>QUANTITY or DEVICE<br>TYPE CALIBRATED | RANGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | UNCERTAINTY <sup>1,2</sup><br>(±)                                                                                                                                                                                                                                                          | CALIBRATION PROCEDURE<br>AND/OR STANDARD<br>EQUIPMENT USED    |
|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|
|                                                   | 0.2 V to 1.9999 V<br>2 V to 19.999 V<br>20 V to 199.99 V<br>200 V to 1050 V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 8.3 $\mu$ V<br>82 $\mu$ V<br>1.3 mV<br>7.0 mV                                                                                                                                                                                                                                              |                                                               |
| DC Current – Generate <sup>3,5</sup>              | 0 to 199.99 $\mu$ A<br>0.2 mA to 1.9999 mA<br>2 mA to 19.999 mA<br>20 mA to 199.99 mA<br>0.2 A to 1.9999 A<br>2 A to 19.999 A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3.3 nA<br>33 nA<br>0.36 $\mu$ A<br>11 $\mu$ A<br>0.4 mA<br>9.3 mA                                                                                                                                                                                                                          | Fluke 8508A in Series with a source                           |
| DC Current – Measure <sup>4,5</sup>               | 0 to 199.99 $\mu$ A<br>0.2 mA to 1.9999 mA<br>2 mA to 19.999 mA<br>20 mA to 199.99 mA<br>0.2 A to 1.9999 A<br>2 A to 19.999 A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3.1 nA<br>32 nA<br>0.36 $\mu$ A<br>11 $\mu$ A<br>0.43 mA<br>9.4 mA                                                                                                                                                                                                                         | Fluke 8508A                                                   |
| DC Resistance –<br>Generate <sup>3,5</sup>        | 0 $\Omega$ to 10.9999 $\Omega$<br>11 $\Omega$ to 32.9999 $\Omega$<br>33 $\Omega$ to 109.9999 $\Omega$<br>110 $\Omega$ to 329.9999 $\Omega$<br>330 $\Omega$ to 1.099999 k $\Omega$<br>1.1 k $\Omega$ to 3.299999 k $\Omega$<br>3.3 k $\Omega$ to 10.99999 k $\Omega$<br>11 k $\Omega$ to 32.99999 k $\Omega$<br>33 k $\Omega$ to 109.9999 k $\Omega$<br>110 k $\Omega$ to 329.9999 k $\Omega$<br>330 k $\Omega$ to 1.099999 M $\Omega$<br>1.1 M $\Omega$ to 3.299999 M $\Omega$<br>3.3 M $\Omega$ to 10.99999 M $\Omega$<br>11 M $\Omega$ to 32.99999 M $\Omega$<br>33 M $\Omega$ to 109.9999 M $\Omega$<br>110 M $\Omega$ to 329.9999 M $\Omega$<br>330 M $\Omega$ to 1100 M $\Omega$ | 12 m $\Omega$<br>18 m $\Omega$<br>21 m $\Omega$<br>26m $\Omega$<br>55 m $\Omega$<br>330 m $\Omega$<br>450 m $\Omega$<br>2.1 $\Omega$<br>4.5 $\Omega$<br>23 $\Omega$<br>49 $\Omega$<br>420 $\Omega$<br>1.8 k $\Omega$<br>12 k $\Omega$<br>13 k $\Omega$<br>1.2 M $\Omega$<br>2.6 M $\Omega$ | Fluke 5520A<br>4-Wire Compensation and<br>4-Wire Measure      |
| DC Resistance Measure <sup>4,5</sup>              | 0 $\Omega$ to 1.9999 $\Omega$<br>2 $\Omega$ to 19.999 $\Omega$<br>20 $\Omega$ to 199.99 $\Omega$<br>200 $\Omega$ to 1.9999 k $\Omega$<br>2 k $\Omega$ to 19.999 k $\Omega$<br>20 k $\Omega$ to 199.99 k $\Omega$<br>200 k $\Omega$ to 1.9999 M $\Omega$<br>2 M $\Omega$ to 19.999 M $\Omega$<br>20 M $\Omega$ to 199.99 M $\Omega$<br>200 M $\Omega$ to 1.9999 G $\Omega$                                                                                                                                                                                                                                                                                                             | 40 $\mu$ $\Omega$<br>210 $\mu$ $\Omega$<br>1.7 m $\Omega$<br>17 m $\Omega$<br>170 m $\Omega$<br>1.7 $\Omega$<br>19 $\Omega$<br>430 $\Omega$<br>30 k $\Omega$<br>2 M $\Omega$                                                                                                               | Fluke 8508A<br>4-wire Normal Mode<br><br>2 – wire Normal Mode |
| Electrical Temperature<br>Simulation -            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                            | Fluke 5520A, HP 3458A                                         |

# SCOPE OF ACCREDITATION

International Accreditation Service, Inc.

3060 Saturn Street, Suite 100, Brea, California 92821, U.S.A. | [www.iasonline.org](http://www.iasonline.org)

| MEASURED<br>QUANTITY or DEVICE<br>TYPE CALIBRATED | RANGE                                                                                                  | UNCERTAINTY <sup>1,2</sup><br>(±)                   | CALIBRATION PROCEDURE<br>AND/OR STANDARD<br>EQUIPMENT USED |
|---------------------------------------------------|--------------------------------------------------------------------------------------------------------|-----------------------------------------------------|------------------------------------------------------------|
| Thermocouples <sup>5</sup>                        |                                                                                                        |                                                     |                                                            |
| Type B                                            | 600 °C to 800 °C<br>800 °C to 1000 °C<br>1000 °C to 1550 °C<br>1550 °C to 1850 °C                      | 0.5 °C<br>0.4 °C<br>0.35 °C<br>0.39 °C              |                                                            |
| Type E                                            | -250 °C to -100 °C<br>-100 °C to -25 °C<br>-25 °C to 350 °C<br>350 °C to 650 °C<br>650 °C to 1000 °C   | 0.59 °C<br>0.19 °C<br>0.17 °C<br>0.19 °C<br>0.25 °C |                                                            |
| Type J                                            | -210 °C to -100 °C<br>-100 °C to -30 °C<br>-30 °C to 150 °C<br>150 °C to 760 °C<br>760 °C to 1200 °C   | 0.32 °C<br>0.19 °C<br>0.17 °C<br>0.2 °C<br>0.27 °C  |                                                            |
| Type K                                            | -200 °C to -100 °C<br>-100 °C to -25 °C<br>-25 °C to 120 °C<br>120 °C to 1000 °C<br>1000 °C to 1372 °C | 0.38 °C<br>0.21 °C<br>0.19 °C<br>0.3 °C<br>0.46 °C  |                                                            |
| Type N                                            | -200 °C to -100 °C<br>-100 °C to -25 °C<br>-25 °C to 120 °C<br>120 °C to 410 °C<br>410 °C to 1300 °C   | 0.46 °C<br>0.26 °C<br>0.23 °C<br>0.21 °C<br>0.32 °C |                                                            |
| Type R                                            | 0 °C to 250 °C<br>250 °C to 400 °C<br>400 °C to 1000 °C<br>1000 °C to 1767 °C                          | 0.66 °C<br>0.41 °C<br>0.39 °C<br>0.47 °C            |                                                            |
| Type S                                            | 0 °C to 250 °C<br>250 °C to 1000 °C<br>1000 °C to 1400 °C<br>1400 °C to 1767 °C                        | 0.55 °C<br>0.42 °C<br>0.43 °C<br>0.53 °C            |                                                            |
| Type T                                            | -250 °C to -150 °C<br>-150 °C to 0 °C<br>0 °C to 120 °C<br>120 °C to 400 °C                            | 0.73 °C<br>0.28 °C<br>0.19 °C<br>0.17 °C            |                                                            |
| Type U                                            | -200 °C to 0 °C<br>0 °C to 600 °C                                                                      | 0.65 °C<br>0.32 °C                                  |                                                            |

# SCOPE OF ACCREDITATION

International Accreditation Service, Inc.

3060 Saturn Street, Suite 100, Brea, California 92821, U.S.A. | [www.iasonline.org](http://www.iasonline.org)

| MEASURED<br>QUANTITY or DEVICE<br>TYPE CALIBRATED | RANGE                               | UNCERTAINTY <sup>1,2</sup><br>(±) | CALIBRATION PROCEDURE<br>AND/OR STANDARD<br>EQUIPMENT USED |
|---------------------------------------------------|-------------------------------------|-----------------------------------|------------------------------------------------------------|
| AC Voltage – Generate <sup>3</sup>                | Up to 2.2 mV<br>(10 Hz to 20 Hz)    | 9.9 µV                            | Fluke 5790A in parallel with<br>source                     |
|                                                   | (20 Hz to 40 Hz)                    | 11 µV                             |                                                            |
|                                                   | (40 Hz to 20 kHz)                   | 9.6 µV                            |                                                            |
|                                                   | (20 kHz to 50 kHz)                  | 11 µV                             |                                                            |
|                                                   | Up to 2.2 mV<br>(50 kHz to 100 kHz) | 38 µV                             |                                                            |
|                                                   | (100 kHz to 300 kHz)                | 67 µV                             |                                                            |
|                                                   | (300 kHz to 500 kHz)                | 220 µV                            |                                                            |
|                                                   | 2.2 mV to 7 mV<br>(10 Hz to 20 Hz)  | 74 µV                             |                                                            |
|                                                   | (20 Hz to 40 Hz)                    | 4.1 µV                            |                                                            |
|                                                   | (40 Hz to 20 kHz)                   | 3.4 µV                            |                                                            |
|                                                   | (20 kHz to 50 kHz)                  | 5.4 µV                            |                                                            |
|                                                   | (50 kHz to 100 kHz)                 | 7.9 µV                            |                                                            |
|                                                   | (100 kHz to 300 kHz)                | 15 µV                             |                                                            |
|                                                   | (300 kHz to 500 kHz)                | 28 µV                             |                                                            |
|                                                   | (500 kHz to 1 MHz)                  | 56 µV                             |                                                            |
|                                                   | 7 mV to 22 mV<br>(10 Hz to 20 Hz)   | 8.8 µV                            |                                                            |
|                                                   | (20 Hz to 40 Hz)                    | 7.8 µV                            |                                                            |
|                                                   | (40 Hz to 20 kHz)                   | 6.7 µV                            |                                                            |
|                                                   | (20 kHz to 50 kHz)                  | 7.5 µV                            |                                                            |
|                                                   | (50 kHz to 100 kHz)                 | 18 µV                             |                                                            |
|                                                   | (100 kHz to 300 kHz)                | 33 µV                             |                                                            |
|                                                   | (300 kHz to 500 kHz)                | 39 µV                             |                                                            |
|                                                   | (500 kHz to 1 MHz)                  | 94 µV                             |                                                            |
|                                                   | 22 mV to 70 mV<br>(10 Hz to 20 Hz)  | 180 µV                            |                                                            |
|                                                   | (20 Hz to 40 Hz)                    | 11 µV                             |                                                            |
|                                                   | (40 Hz to 20 kHz)                   | 7.2 µV                            |                                                            |
|                                                   | (20 kHz to 50 kHz)                  | 23 µV                             |                                                            |
|                                                   | (50 kHz to 100 kHz)                 | 110 µV                            |                                                            |
|                                                   | (100 kHz to 300 kHz)                | 42 µV                             |                                                            |
|                                                   | (300 kHz to 500 kHz)                | 140 µV                            |                                                            |
|                                                   | (500 kHz to 1 MHz)                  | 170 µV                            |                                                            |
|                                                   | 70 mV to 220 mV<br>(10 Hz to 20 Hz) | 55 µV                             |                                                            |
|                                                   | (20 Hz to 40 Hz)                    | 22 µV                             |                                                            |
|                                                   | (40 Hz to 20 kHz)                   | 13 µV                             |                                                            |
|                                                   | (20 kHz to 50 kHz)                  | 18 µV                             |                                                            |
|                                                   | (50 kHz to 100 kHz)                 | 40 µV                             |                                                            |
|                                                   | (100 kHz to 300 kHz)                | 63 µV                             |                                                            |
|                                                   | (300 kHz to 500 kHz)                | 97 µV                             |                                                            |
|                                                   | (500 kHz to 1 MHz)                  | 630 µV                            |                                                            |

# SCOPE OF ACCREDITATION

International Accreditation Service, Inc.

3060 Saturn Street, Suite 100, Brea, California 92821, U.S.A. | [www.iasonline.org](http://www.iasonline.org)

| MEASURED<br>QUANTITY or DEVICE<br>TYPE CALIBRATED | RANGE                | UNCERTAINTY <sup>1,2</sup><br>(±) | CALIBRATION PROCEDURE<br>AND/OR STANDARD<br>EQUIPMENT USED |
|---------------------------------------------------|----------------------|-----------------------------------|------------------------------------------------------------|
| AC Voltage – Generate <sup>3</sup><br>(continued) | 220 mV to 700 mV     |                                   | Fluke 5790A in parallel with<br>source                     |
|                                                   | (10 Hz to 20 Hz)     | 150 µV                            |                                                            |
|                                                   | (20 Hz to 40 Hz)     | 230 µV                            |                                                            |
|                                                   | (40 Hz to 20 kHz)    | 28 µV                             |                                                            |
|                                                   | (20 kHz to 50 kHz)   | 39 µV                             |                                                            |
|                                                   | (50 kHz to 100 kHz)  | 59 µV                             |                                                            |
|                                                   | (100 kHz to 300 kHz) | 130 µV                            |                                                            |
|                                                   | (300 kHz to 500 kHz) | 220 µV                            |                                                            |
|                                                   | (500 kHz to 1 MHz)   | 680 µV                            |                                                            |
|                                                   | 700 mV to 2.2 V      |                                   |                                                            |
|                                                   | (10 Hz to 20 Hz)     | 0.6 mV                            |                                                            |
|                                                   | (20 Hz to 40 Hz)     | 0.1 mV                            |                                                            |
|                                                   | (40 Hz to 20 kHz)    | 0.1 mV                            |                                                            |
|                                                   | (20 kHz to 50 kHz)   | 0.1 mV                            |                                                            |
|                                                   | (50 kHz to 100 kHz)  | 0.2 mV                            |                                                            |
|                                                   | (100 kHz to 300 kHz) | 2.0 mV                            |                                                            |
|                                                   | (300 kHz to 500 kHz) | 4.1 mV                            |                                                            |
|                                                   | (500 kHz to 1 MHz)   | 49 mV                             |                                                            |
|                                                   | 2.2 V to 7 V         |                                   |                                                            |
|                                                   | (10 Hz to 20 Hz)     | 1.4 mV                            |                                                            |
|                                                   | (20 Hz to 40 Hz)     | 0.5 mV                            |                                                            |
|                                                   | (40 Hz to 20 kHz)    | 0.2 mV                            |                                                            |
|                                                   | (20 kHz to 50 kHz)   | 0.3 mV                            |                                                            |
|                                                   | (50 kHz to 100 kHz)  | 0.6 mV                            |                                                            |
|                                                   | 7 V to 22 V          |                                   |                                                            |
|                                                   | (10 Hz to 20 Hz)     | 4.6 mV                            |                                                            |
|                                                   | (20 Hz to 40 Hz)     | 1.6 mV                            |                                                            |
|                                                   | (40 Hz to 20 kHz)    | 0.6 mV                            |                                                            |
|                                                   | (20 kHz to 50 kHz)   | 1.1 mV                            |                                                            |
|                                                   | (50 kHz to 100 kHz)  | 1.9 mV                            |                                                            |
|                                                   | 22 V to 70 V         |                                   |                                                            |
|                                                   | (40 Hz to 20 kHz)    | 2.3 mV                            |                                                            |
|                                                   | (20 kHz to 50 kHz)   | 4.0 mV                            |                                                            |
|                                                   | (50 kHz to 100 kHz)  | 6.5 mV                            |                                                            |
|                                                   | 70 V to 220 V        |                                   |                                                            |
|                                                   | (40 Hz to 20 kHz)    | 7.2 mV                            |                                                            |
|                                                   | (20 kHz to 50 kHz)   | 16 mV                             |                                                            |
|                                                   | (50 kHz to 100 kHz)  | 23 mV                             |                                                            |
|                                                   | 220 V to 700 V       |                                   |                                                            |
|                                                   | (40 Hz to 20 kHz)    | 22 mV                             |                                                            |
|                                                   | 700 V to 1000 V      |                                   |                                                            |
|                                                   | (40 Hz to 20 kHz)    | 0.4 V                             |                                                            |

# SCOPE OF ACCREDITATION

International Accreditation Service, Inc.

3060 Saturn Street, Suite 100, Brea, California 92821, U.S.A. | [www.iasonline.org](http://www.iasonline.org)

| MEASURED<br>QUANTITY or DEVICE<br>TYPE CALIBRATED | RANGE                | UNCERTAINTY <sup>1,2</sup><br>(±) | CALIBRATION PROCEDURE<br>AND/OR STANDARD<br>EQUIPMENT USED |
|---------------------------------------------------|----------------------|-----------------------------------|------------------------------------------------------------|
| AC Voltage – Measure <sup>4</sup>                 | Up to 2.2 mV         |                                   | Fluke 5790A                                                |
|                                                   | (10 Hz to 20 Hz)     | 9.9 µV                            |                                                            |
|                                                   | (20 Hz to 40 Hz)     | 11 µV                             |                                                            |
|                                                   | (40 Hz to 20 kHz)    | 9.4 µV                            |                                                            |
|                                                   | (20 kHz to 50 kHz)   | 11 µV                             |                                                            |
|                                                   | (50 kHz to 100 kHz)  | 33 µV                             |                                                            |
|                                                   | (100 kHz to 300 kHz) | 67 µV                             |                                                            |
|                                                   | (300 kHz to 500 kHz) | 220 µV                            |                                                            |
|                                                   | 2.2 mV to 7 mV       |                                   |                                                            |
|                                                   | (10 Hz to 20 Hz)     | 74 µV                             |                                                            |
|                                                   | (20 Hz to 40 Hz)     | 4.1 µV                            |                                                            |
|                                                   | (40 Hz to 20 kHz)    | 3.4 µV                            |                                                            |
|                                                   | (20 kHz to 50 kHz)   | 5.4 µV                            |                                                            |
|                                                   | (50 kHz to 100 kHz)  | 7.9 µV                            |                                                            |
|                                                   | (100 kHz to 300 kHz) | 15 µV                             |                                                            |
|                                                   | (300 kHz to 500 kHz) | 28 µV                             |                                                            |
|                                                   | (500 kHz to 1 MHz)   | 55 µV                             |                                                            |
|                                                   | 7 mV to 22 mV        |                                   |                                                            |
|                                                   | (10 Hz to 20 Hz)     | 8.2 µV                            |                                                            |
|                                                   | (20 Hz to 40 Hz)     | 5.9 µV                            |                                                            |
|                                                   | (40 Hz to 20 kHz)    | 4.2 µV                            |                                                            |
|                                                   | (20 kHz to 50 kHz)   | 7.5 µV                            |                                                            |
|                                                   | (50 kHz to 100 kHz)  | 18 µV                             |                                                            |
|                                                   | (100 kHz to 300 kHz) | 33 µV                             |                                                            |
|                                                   | (300 kHz to 500 kHz) | 39 µV                             |                                                            |
|                                                   | (500 kHz to 1 MHz)   | 98 µV                             |                                                            |
|                                                   | 22 mV to 70 mV       |                                   |                                                            |
|                                                   | (10 Hz to 20 Hz)     | 180 µV                            |                                                            |
|                                                   | (20 Hz to 40 Hz)     | 11 µV                             |                                                            |
|                                                   | (40 Hz to 20 kHz)    | 6.3 µV                            |                                                            |
|                                                   | (20 kHz to 50 kHz)   | 13 µV                             |                                                            |
|                                                   | (50 kHz to 100 kHz)  | 28 µV                             |                                                            |
|                                                   | (100 kHz to 300 kHz) | 41 µV                             |                                                            |
|                                                   | (300 kHz to 500 kHz) | 140 µV                            |                                                            |
|                                                   | (500 kHz to 1 MHz)   | 170 µV                            |                                                            |
|                                                   | 70 mV to 220 mV      |                                   |                                                            |
|                                                   | (10 Hz to 20 Hz)     | 50 µV                             |                                                            |
|                                                   | (20 Hz to 40 Hz)     | 21 µV                             |                                                            |
|                                                   | (40 Hz to 20 kHz)    | 11 µV                             |                                                            |
|                                                   | (20 kHz to 50 kHz)   | 18 µV                             |                                                            |
|                                                   | (50 kHz to 100 kHz)  | 40 µV                             |                                                            |
|                                                   | (100 kHz to 300 kHz) | 63 µV                             |                                                            |
|                                                   | (300 kHz to 500 kHz) | 97 µV                             |                                                            |
|                                                   | (500 kHz to 1 MHz)   | 630 µV                            |                                                            |

# SCOPE OF ACCREDITATION

International Accreditation Service, Inc.

3060 Saturn Street, Suite 100, Brea, California 92821, U.S.A. | [www.iasonline.org](http://www.iasonline.org)

| MEASURED<br>QUANTITY or DEVICE<br>TYPE CALIBRATED | RANGE                | UNCERTAINTY <sup>1,2</sup><br>(±) | CALIBRATION PROCEDURE<br>AND/OR STANDARD<br>EQUIPMENT USED |
|---------------------------------------------------|----------------------|-----------------------------------|------------------------------------------------------------|
| AC Voltage – Measure <sup>4</sup><br>continued    | 220 mV to 700 mV     |                                   | Fluke 5790A                                                |
|                                                   | (10 Hz to 20 Hz)     | 150 µV                            |                                                            |
|                                                   | (20 Hz to 40 Hz)     | 55 µV                             |                                                            |
|                                                   | (40 Hz to 20 kHz)    | 25 µV                             |                                                            |
|                                                   | (20 kHz to 50 kHz)   | 38 µV                             |                                                            |
|                                                   | (50 kHz to 100 kHz)  | 58 µV                             |                                                            |
|                                                   | (100 kHz to 300 kHz) | 130 µV                            |                                                            |
|                                                   | (300 kHz to 500 kHz) | 220 µV                            |                                                            |
|                                                   | (500 kHz to 1 MHz)   | 680 µV                            |                                                            |
|                                                   | 700 mV to 2.2 V      |                                   |                                                            |
|                                                   | (10 Hz to 20 Hz)     | 0.6 mV                            |                                                            |
|                                                   | (20 Hz to 40 Hz)     | 0.1 mV                            |                                                            |
|                                                   | (40 Hz to 20 kHz)    | 0.1 mV                            |                                                            |
|                                                   | (20 kHz to 50 kHz)   | 0.1 mV                            |                                                            |
|                                                   | (50 kHz to 100 kHz)  | 0.2 mV                            |                                                            |
|                                                   | (100 kHz to 300 kHz) | 2.0 mV                            |                                                            |
|                                                   | (300 kHz to 500 kHz) | 4.1 mV                            |                                                            |
|                                                   | (500 kHz to 1 MHz)   | 49 mV                             |                                                            |
|                                                   | 2.2 V to 7 V         |                                   |                                                            |
|                                                   | (10 Hz to 20 Hz)     | 1.4 mV                            |                                                            |
|                                                   | (20 Hz to 40 Hz)     | 0.5 mV                            |                                                            |
|                                                   | (40 Hz to 20 kHz)    | 0.2 mV                            |                                                            |
|                                                   | (20 kHz to 50 kHz)   | 0.3 mV                            |                                                            |
|                                                   | (50 kHz to 100 kHz)  | 0.6 mV                            |                                                            |
|                                                   | 7 V to 22 V          |                                   |                                                            |
|                                                   | (10 Hz to 20 Hz)     | 4.6 mV                            |                                                            |
|                                                   | (20 Hz to 40 Hz)     | 1.6 mV                            |                                                            |
|                                                   | (40 Hz to 20 kHz)    | 0.6 mV                            |                                                            |
|                                                   | (20 kHz to 50 kHz)   | 1.1 mV                            |                                                            |
|                                                   | (50 kHz to 100 kHz)  | 1.9 mV                            |                                                            |
|                                                   | 22 V to 70 V         |                                   |                                                            |
|                                                   | (40 Hz to 20 kHz)    | 2.2 mV                            |                                                            |
|                                                   | (20 kHz to 50 kHz)   | 4.0 mV                            |                                                            |
|                                                   | (50 kHz to 100 kHz)  | 6.5 mV                            |                                                            |
|                                                   | 70 V to 220 V        |                                   |                                                            |
|                                                   | (40 Hz to 20 kHz)    | 7.2 mV                            |                                                            |
|                                                   | (20 kHz to 50 kHz)   | 16 mV                             |                                                            |
|                                                   | (50 kHz to 100 kHz)  | 23 mV                             |                                                            |
|                                                   | 220 V to 700 V       |                                   |                                                            |
|                                                   | (40 Hz to 20 kHz)    | 22 mV                             |                                                            |
|                                                   | 700 V to 1000 V      |                                   |                                                            |
|                                                   | (40 Hz to 20 kHz)    | 48 mV                             |                                                            |

# SCOPE OF ACCREDITATION

International Accreditation Service, Inc.

3060 Saturn Street, Suite 100, Brea, California 92821, U.S.A. | [www.iasonline.org](http://www.iasonline.org)

| MEASURED<br>QUANTITY or DEVICE<br>TYPE CALIBRATED | RANGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | UNCERTAINTY <sup>1,2</sup><br>(±)                                                                                                                                                                       | CALIBRATION PROCEDURE<br>AND/OR STANDARD<br>EQUIPMENT USED |
|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| Capacitance – Generate <sup>3,6</sup>             | 0.19 nF to 0.3999 nF<br>0.4 nF to 1.0999 nF<br>1.1 nF to 3.2999 nF<br>3.3 nF to 10.9999 nF<br>11 nF to 32.9999 nF<br>33 nF to 109.999 nF<br>110 nF to 329.999 nF<br>0.33 µF to 1.09999 µF<br>1.1 µF to 3.29999 µF<br>3.3 µF to 10.9999 µF<br>11 µF to 32.9999 µF<br>33 µF to 109.999 µF<br>110 µF to 329.999 µF<br>0.33 mF to 1.09999 mF<br>1.1 mF to 3.2999 mF<br>3.3 mF to 10.9999 mF<br>11 mF to 32.9999 mF<br>33 mF to 110 mF                                                                                                                               | 14 pF<br>17 pF<br>29 pF<br>41 pF<br>0.2 nF<br>0.41 nF<br>1.2 nF<br>4.1 nF<br>12 nF<br>41 nF<br>0.17 µF<br>0.64 µF<br>1.9 µF<br>6.4 µF<br>19 µF<br>65 µF<br>0.29 mF<br>150 mF                            | 5520A/SC600                                                |
| AC Current – Measure <sup>4</sup>                 | Up to 199.99 µA<br>(1 Hz to 10 Hz)<br>(10 Hz to 10 kHz)<br>(10 kHz to 30 kHz)<br>(30 kHz to 100 kHz)<br><br>0.2 mA to 1.9999 mA<br>(1 Hz to 10 Hz)<br>(10 Hz to 10 kHz)<br>(10 kHz to 30 kHz)<br>(30 kHz to 100 kHz)<br><br>2 mA to 19.999 mA<br>(10 Hz to 10 kHz)<br>(10 kHz to 30 kHz)<br>(30 kHz to 100 kHz)<br><br>20 mA to 199.99 mA<br>(1 Hz to 10 Hz)<br>(10 Hz to 10 kHz)<br>(10 kHz to 30 kHz)<br><br>0.2 A to 1.9999 A<br>(10 Hz to 2 kHz)<br>(2 kHz to 10 kHz)<br>(10 kHz to 30 kHz)<br><br>2 A to 19.999 A<br>(10 Hz to 2 kHz)<br>(2 kHz to 10 kHz) | 34 nA<br>130 nA<br>180 nA<br>1.1 µA<br><br>1.0 µA<br>0.9 µA<br>1.8 µA<br>9.0 µA<br><br>9.0 µA<br>18 µA<br>90 µA<br><br>92 µA<br>87 µA<br>160 µA<br><br>1.6 mA<br>6.3 mA<br>6.8 mA<br><br>21 mA<br>58 mA | Fluke 8508A                                                |

# SCOPE OF ACCREDITATION

International Accreditation Service, Inc.

3060 Saturn Street, Suite 100, Brea, California 92821, U.S.A. | [www.iasonline.org](http://www.iasonline.org)

| MEASURED<br>QUANTITY or DEVICE<br>TYPE CALIBRATED               | RANGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | UNCERTAINTY <sup>1,2</sup><br>(±)                                                                                                                                                                       | CALIBRATION PROCEDURE<br>AND/OR STANDARD<br>EQUIPMENT USED |
|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| AC Current – Generate <sup>3</sup>                              | Up to 199.99 µA<br>(1 Hz to 10 Hz)<br>(10 Hz to 10 kHz)<br>(10 kHz to 30 kHz)<br>(30 kHz to 100 kHz)<br><br>0.2 mA to 1.9999 mA<br>(1 Hz to 10 Hz)<br>(10 Hz to 10 kHz)<br>(10 kHz to 30 kHz)<br>(30 kHz to 100 kHz)<br><br>2 mA to 19.999 mA<br>(10 Hz to 10 kHz)<br>(10 kHz to 30 kHz)<br>(30 kHz to 100 kHz)<br><br>20 mA to 199.99 mA<br>(1 Hz to 10 Hz)<br>(10 Hz to 10 kHz)<br>(10 kHz to 30 kHz)<br><br>0.2 A to 1.9999 A<br>(10 Hz to 2 kHz)<br>(2 kHz to 10 kHz)<br>(10 kHz to 30 kHz)<br><br>2 A to 19.999 A<br>(10 Hz to 2 kHz)<br>(2 kHz to 10 kHz) | 34 nA<br>130 nA<br>180 nA<br>1.1 µA<br><br>1.0 µA<br>0.9 µA<br>1.8 µA<br>9.0 µA<br><br>9.0 µA<br>18 µA<br>90 µA<br><br>92 µA<br>87 µA<br>160 µA<br><br>1.6 mA<br>6.3 mA<br>6.8 mA<br><br>21 mA<br>58 mA | Fluke 8508A in parallel with source                        |
| <b>Time and Frequency</b>                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                         |                                                            |
| Frequency – Generate <sup>3</sup><br>(Sine wave into<br>50 Ω)   | 1 Hz to 100 kHz<br>100 kHz to 10 MHz<br>10 MHz to 500 MHz<br>500 MHz to 2.1 GHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1.5 mHz<br>0.18 Hz<br>5.8 Hz<br>1.2 Hz                                                                                                                                                                  | HP 3325B Signal Generator,<br>HP 8642B- Synced to GPS      |
| Frequency – Measure <sup>4</sup><br>(Sine wave into<br>50 Ω)    | 10 Hz to 100 MHz<br>100 MHz to 500 MHz<br>500 MHz to 1.3 GHz<br>1.3 GHz to 26 GHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.58 Hz<br>0.58 Hz<br>0.58 Hz<br>0.58 Hz                                                                                                                                                                | HP 5334A Universal Counter-<br>Synced to GPS               |
| Amplitude Modulation –<br>Measure <sup>4</sup><br>(5 % to 99 %) | 250 kHz to 10 MHz<br>AM: 50 Hz to 10 kHz<br>AM: 20 Hz to 10 kHz<br><br>10 MHz to 1.3 GHz<br>AM: 50 Hz to 10 kHz<br>AM: 20 Hz to 10 kHz                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.058 %<br>0.058 %<br><br>0.067 %<br>0.067 %                                                                                                                                                            | HP 8902A- Synced to GPS                                    |

# SCOPE OF ACCREDITATION

International Accreditation Service, Inc.

3060 Saturn Street, Suite 100, Brea, California 92821, U.S.A. | [www.iasonline.org](http://www.iasonline.org)

| MEASURED QUANTITY or DEVICE TYPE CALIBRATED                          | RANGE                                     | UNCERTAINTY <sup>1,2</sup> (±) | CALIBRATION PROCEDURE AND/OR STANDARD EQUIPMENT USED |
|----------------------------------------------------------------------|-------------------------------------------|--------------------------------|------------------------------------------------------|
| Frequency Modulation – Measure <sup>4</sup><br>(Dev: ≤40 kHz)        | 250 kHz to 10 MHz<br>FM: 50 Hz to 10 kHz  | 5.8 Hz                         | HP 8902A- Synced to GPS                              |
|                                                                      | 10 MHz to 1.3 GHz<br>FM: 50 Hz to 100 kHz | 2.3 Hz                         |                                                      |
| Chemical/Gas                                                         |                                           |                                |                                                      |
| Gas Detection Equipment <sup>5</sup> – O <sub>2</sub>                | 12 %                                      | 0.95 %                         | Primary Standard Gas                                 |
|                                                                      | 15 %                                      | 0.81 %                         |                                                      |
|                                                                      | 18 %                                      | 0.83 %                         |                                                      |
|                                                                      | 20.9 %                                    | 0.73 %                         |                                                      |
| Gas Detection Equipment <sup>5</sup> – CO                            | 20 ppm                                    | 1.4 parts per 10 <sup>6</sup>  |                                                      |
|                                                                      | 50 ppm                                    | 2.6 parts per 10 <sup>6</sup>  |                                                      |
|                                                                      | 60 ppm                                    | 3.0 parts per 10 <sup>6</sup>  |                                                      |
| Gas Detection Equipment <sup>5</sup> – H <sub>2</sub> S              | 20 ppm                                    | 2.7 parts per 10 <sup>6</sup>  | Primary Standard Gas                                 |
|                                                                      | 25 ppm                                    | 2.7 parts per 10 <sup>6</sup>  |                                                      |
| Gas Detection Equipment <sup>5</sup> – LEL                           | 50 %                                      | 1.9 %                          |                                                      |
|                                                                      | 58 %                                      | 1.9 %                          |                                                      |
| Gas Detection Equipment <sup>5</sup> – C <sub>4</sub> H <sub>8</sub> | 100 ppm                                   | 2.7 parts per 10 <sup>6</sup>  |                                                      |

The laboratory was also found to meet the requirements of ANSI/NCSL Z540.3: American National Standard for Calibration – Requirements for the calibration of measuring and test equipment.

<sup>1</sup>The uncertainty covered by the Calibration and Measurement Capability (CMC) is expressed as the expanded uncertainty having a coverage probability of approximately 95 %. It is the smallest measurement uncertainty that a laboratory can achieve within its scope of accreditation when performing calibrations of a best existing device. The measurement uncertainty reported on a calibration certificate may be greater than that provided in the CMC due to the behavior of the calibration item and other factors that may contribute to the uncertainty of a specific calibration.

<sup>2</sup>When uncertainty is stated in relative terms (such as percent, a multiplier expressed as a decimal fraction or in scientific notation), it is in relation to instrument reading or instrument output, as appropriate, unless otherwise indicated.

<sup>3</sup>Capability is suitable for the calibration of measuring devices in the stated ranges.

<sup>4</sup>Capability is suitable for the calibration of devices intended to generate the indicated quantity in the stated ranges.

<sup>5</sup>On-site calibration services available for this calibration. Note that actual measurement uncertainties achievable on a customer's site can normally be expected to be larger than the CMC listed on this Scope of Accreditation.

<sup>6</sup>The actual frequency applied by the calibrator cannot be selected and may be dependent on the measurement device under calibration. Approximate frequency ranges for a given capacitance or capacitance range may be found in the Fluke 5520A's published specifications.

FS = full scale  
RDG = reading  
Φ = diameter  
ppm = parts per million  
LEL = lower explosive limit