



# CERTIFICATE OF ACCREDITATION

**ANSI-ASQ National Accreditation Board/AClass**  
500 Montgomery Street, Suite 625, Alexandria, VA 22314, 877-344-3044

This is to certify that

**Evans Analytical Group, LLC**  
**3019 Alvin Devane Blvd.**  
**Austin, TX 78741**

has been assessed by AClass  
and meets the requirements of international standard

**ISO/IEC 17025:2005**

while demonstrating technical competence in the field(s) of

**CALIBRATION**

Refer to the accompanying Scope(s) of Accreditation for information regarding the types of calibrations to which this accreditation applies.

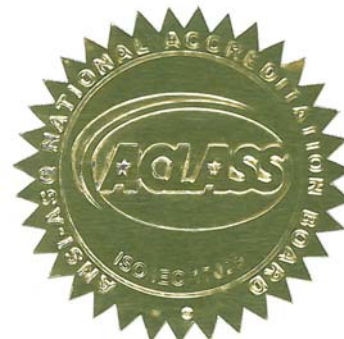
AC-1323

Certificate Number

AClass Approval

Certificate Valid 04/14/2008-04/14/2010

Version No. 001



This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. 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 January 2009).



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

Evans Analytical Group, LLC

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CALIBRATION

Valid to: April 14, 2010

Certificate Number: AC-1323

I. Electromagnetic – DC/Low Frequency

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
DC Volts – Source	(0 to 220) mV 220 mV to 2.2 V (2.2 to 11) V (11 to 22) V (22 to 220) V (220 to 1 100) V	7.5 $\mu$ V/V + 0.4 $\mu$ V 5 $\mu$ V/V + 0.7 $\mu$ V 3.5 $\mu$ V/V + 2.5 $\mu$ V 3.5 $\mu$ V/V + 4 $\mu$ V 5 $\mu$ V/V + 0.04 mV 6.5 $\mu$ V/V + 0.4 mV	Fluke 5720A Opt 03 Fluke 5725A	OEM and GIDEP Sourced Calibration Procedures and MetCal
DC Volts - Measure	Up to 200 mV 200 mV to 2 V (2 to 20) V (20 to 200) V (200 to 1000) V	5.0 $\mu$ V/V + 0.1 $\mu$ V 3.5 $\mu$ V/V + 0.4 $\mu$ V 3.5 $\mu$ V/V + 4 $\mu$ V 5.5 $\mu$ V/V + 40 $\mu$ V 5.5 $\mu$ V/V + 0.5 mV	8508A OPT 01	OEM and GIDEP
DC Current - Measure	(100 to 200) $\mu$ A 200 $\mu$ A to 2 mA (2 to 20) mA (20 to 200) mA 200 mA to 2 A (2 to 20) A	12 $\mu$ A/A + 0.4 nA 12 $\mu$ A/A + 4 nA 14 $\mu$ A/A + 40 nA 48 $\mu$ A/A + 800 nA 185 $\mu$ A/A + 16 $\mu$ A 400 $\mu$ A/A + 400 $\mu$ A	Fluke 8508A OPT 001	OEM and GIDEP
DC Current – Source	2 pA 20 pA 200 pA 2 nA 20 nA 200 nA 2 $\mu$ A 20 $\mu$ A 200 $\mu$ A 2 mA 20 mA	8.5 mA/A + 10 fA 7.5 mA/A + 10 fA 5 mA/A + 30 fA 1.3 mA/A + 100 fA 1.3 mA/A + 1 pA 0.7 mA/A + 10 pA 0.5 mA/A + 100 pA 0.5 mA/A + 1 nA 0.5 mA/A + 10 nA 0.5 mA/A + 100 nA 3 mA/A + 1 $\mu$ A	Keithley 263	OEM and GIDEP



PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
DC Current – Source	(0 to 220) $\mu$ A 220 $\mu$ A to 2.2 mA (2.2 to 22) mA (22 to 220) mA 220 mA to 2.2 A (2.2 to 11) A (11 to 20.5) A	40 $\mu$ A/A + 6 $\mu$ A 35 $\mu$ A/A + 7 $\mu$ A 35 $\mu$ A/A + 40 $\mu$ A 45 $\mu$ A/A + 0.7 $\mu$ A 80 $\mu$ A/A + 12 $\mu$ A 500 $\mu$ A/A + 500 $\mu$ A 1 000 $\mu$ A/A + 750 $\mu$ A	Fluke 5720A	OEM and GIDEP
Capacitance – Fixed Source	1 pF 10 pF 100 pF 1 000 pF	1 mF/F 1 mF/F 1 mF/F 1 mF/F	HP 16381A HP 16382A HP 16383A HP 16384A	OEM and GIDEP
Capacitance – Source	(0.13 to 3.3) nF (3.3 to 11) nF (11 to 110) nF (110 to 330) nF (0.33 to 1.1) $\mu$ F (1.1 to 3.3) $\mu$ F (3.3 to 11) $\mu$ F (11 to 33) $\mu$ F (33 to 110) $\mu$ F (110 to 330) $\mu$ F (0.33 to 1.1) mF (1.1 to 3.3) mF (3.3 to 11) mF (11 to 33) mF (33 to 110) mF	5.8 mF/F + 10 pF 2.9 mF/F + 10 pF 2.9 mF/F + 100 pF 2.9 mF/F + 300 pF 2.9 mF/F + 1 nF 2.9 mF/F + 3 nF 2.9 mF/F + 10 nF 4.7 mF/F + 30 nF 5.3 mF/F + 100 nF 1 mF/F + 300 nF 6 mF/F + 1 $\mu$ F 5.3 mF/F + 3 $\mu$ F 5.3 mF/F + 10 $\mu$ F 8.9 mF/F + 30 $\mu$ F 13 mF/F + 100 $\mu$ F	Fluke 5520A/SC1100	OEM and GIDEP
Resistance – Measure	(0 to 2) $\Omega$ (2 to 20) $\Omega$ (20 to 200) $\Omega$ 200 $\Omega$ to 2 k $\Omega$ (2 to 20) k $\Omega$ (20 to 200) k $\Omega$ 200 k $\Omega$ to 2 M $\Omega$ (2 to 20) M $\Omega$ (20 to 200) M $\Omega$ 200 M $\Omega$ to 2 G $\Omega$	17 $\mu\Omega/\Omega$ + 4 $\mu\Omega$ 9.5 $\mu\Omega/\Omega$ + 14 $\mu\Omega$ 8.0 $\mu\Omega/\Omega$ + 50 $\mu\Omega$ 8.0 $\mu\Omega/\Omega$ + 0.5 m $\Omega$ 8.0 $\mu\Omega/\Omega$ + 5 m $\Omega$ 8.0 $\mu\Omega/\Omega$ + 50 m $\Omega$ 9.0 $\mu\Omega/\Omega$ + 1 $\Omega$ 20 $\mu\Omega/\Omega$ + 100 $\Omega$ 120 $\mu\Omega/\Omega$ + 10 k $\Omega$ 1 510 $\mu\Omega/\Omega$ + 1 000 k $\Omega$	Agilent 3458A OPT002	OEM and GIDEP



PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Resistance – Source	1 Ω 1.9 Ω 10 Ω 19 Ω 100 Ω 190 Ω 1 kΩ 1.9 kΩ 10 kΩ 19 kΩ 100 kΩ 190 kΩ 1 MΩ 1.9 MΩ 10 MΩ 19 MΩ 100 MΩ	95 μΩ 181 μΩ 230 μΩ 437 μΩ 1.0 mΩ 1.9 mΩ 8.5 mΩ 16.2 mΩ 85 mΩ 162 mΩ 1.1 Ω 2.09 Ω 20 Ω 40 Ω 400 Ω 893 Ω 10 kΩ	Fluke 5720A Opt 03	OEM and GIDEP
AC Volts – Source	<b>(0 to 2.2) mV</b> (10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz <b>(2.2 to 22) mV</b> (10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz <b>(22 to 220) mV</b> (10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz	2 351 μV/V + 4 μV 2 337 μV/V + 4 μV 2 170 μV/V + 4 μV 2 181 μV/V + 4 μV 2 244 μV/V + 5 μV 2 484 μV/V + 10 μV 2 705 μV/V + 20 μV 3 798 μV/V + 20 μV 240 μV/V + 4 μV 90 μV/V + 4 μV 80 μV/V + 4 μV 200 μV/V + 4 μV 500 μV/V + 5 μV 1.05 mV/V + 10 μV 1.4 mV/V + 20 μV 2.7 mV/V + 20 μV 240 μV/V + 12 μV 90 μV/V + 7 μV 80 μV/V + 7 μV 200 μV/V + 7 μV 460 μV/V + 17 μV 900 μV/V + 20 μV 1.4 mV/V + 25 μV 2.7 mV/V + 45 μV	Fluke 5720A	OEM and GIDEP



PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Volts – Source	<b>(0.22 to 2.2) V</b> (10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz <b>(2.2 to 22) V</b> (10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz <b>(22 to 220) V</b> (10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz <b>(220 to 1 100) V</b> (15 to 50) Hz (0.05 to 1) kHz	240 $\mu\text{V}/\text{V}$ + 40 $\mu\text{V}$ 90 $\mu\text{V}/\text{V}$ + 15 $\mu\text{V}$ 45 $\mu\text{V}/\text{V}$ + 8 $\mu\text{V}$ 75 $\mu\text{V}/\text{V}$ + 10 $\mu\text{V}$ 110 $\mu\text{V}/\text{V}$ + 30 $\mu\text{V}$ 420 $\mu\text{V}/\text{V}$ + 80 $\mu\text{V}$ 1.0 mV/V + 200 $\mu\text{V}$ 1.7 mV/V + 300 $\mu\text{V}$  240 $\mu\text{V}/\text{V}$ + 400 $\mu\text{V}$ 90 $\mu\text{V}/\text{V}$ + 150 $\mu\text{V}$ 45 $\mu\text{V}/\text{V}$ + 50 $\mu\text{V}$ 70 $\mu\text{V}/\text{V}$ + 100 $\mu\text{V}$ 100 $\mu\text{V}/\text{V}$ + 200 $\mu\text{V}$ 275 $\mu\text{V}/\text{V}$ + 0.6 mV 1.0 mV/V + 2.0 mV 1.5 mV/V + 3.2 mV  279 $\mu\text{V}/\text{V}$ + 4.0 mV 109 $\mu\text{V}/\text{V}$ + 1.5 mV 65 $\mu\text{V}/\text{V}$ + 0.6 mV 123 $\mu\text{V}/\text{V}$ + 1.0 mV 176 $\mu\text{V}/\text{V}$ + 2.5 mV 1.04 mV/V + 16 mV 5.08 mV/V + 40 mV 9.24 mV/V + 80 mV  300 $\mu\text{V}/\text{V}$ + 16 mV 70 $\mu\text{V}/\text{V}$ + 3.5 mV	Fluke 5720A	OEM and GIDEP
AC Volts – Measure	<b>2.2 mV</b> (10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz	2.7 mV/V + 1.3 $\mu\text{V}$ 1.4 mV/V + 1.3 $\mu\text{V}$ 0.86 mV/V + 1.3 $\mu\text{V}$ 1.6 mV/V + 2 $\mu\text{V}$ 1.6 mV/V + 2 $\mu\text{V}$ 2.3 mV/V + 2.5 $\mu\text{V}$ 4.1 mV/V + 4 $\mu\text{V}$ 5.1 mV/V + 8 $\mu\text{V}$ 6.7 mV/V + 8 $\mu\text{V}$	Fluke 5790A	OEM and GIDEP



PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Volts – Measure	<b>7 mV</b> (10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz	0.1.3 mV/V + 1.3 μV 0.0.6 mV/V + 1.3 μV 0.0.37 mV/V + 1.3 μV 0.0.68 mV/V + 2 μV 0.0.68 mV/V + 2 μV 0.1. mV/V + 2.5 μV 0.2. mV/V + 4 μV 0.2.2 mV/V + 8 μV 0.3.3 mV/V + 8 μV	Fluke 5790A	OEM and GIDEP
	<b>22 mV</b> (10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz	0.44 mV/V + 1.3 μV 0.30 mV/V + 1.3 μV 0.18 mV/V + 1.3 μV 0.34 mV/V + 2 μV 0.34 mV/V + 2 μV 0.49 mV/V + 2.5 μV 1.3 mV/V + 4 μV 1.5 mV/V + 8 μV 2.6 mV/V + 8 μV		
	<b>70 mV</b> (10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz	0.35 mV/V + 1.5 μV 0.18 mV/V + 1.5 μV 0.10 mV/V + 1.5 μV 0.20 mV/V + 2 μV 0.20 mV/V + 2 μV 0.38 mV/V + 2.5 μV 0.74 mV/V + 4 μV 0.99 mV/V + 8 μV 1.6 mV/V + 8 μV		
	<b>220 mV</b> (10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz	0.3 mV/V + 1.5 μV 0.12 mV/V + 1.5 μV 0.06 mV/V + 1.5 μV 0.1 mV/V + 2 μV 0.1 mV/V + 2 μV 0.23 mV/V + 2.5 μV 0.36 mV/V + 4 μV 0.55 mV/V + 8 μV 0.85 mV/V + 8 μV		



PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Volts – Measure (cont.)	<b>700 mV</b> (10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz	0.3 mV/V + 1.5 μV 0.11 mV/V + 1.5 μV 0.05 mV/V + 1.5 μV 0.07 mV/V + 2 μV 0.07 mV/V + 2 μV 0.11 mV/V + 2.5 μV 0.26 mV/V + 4 μV 0.43 mV/V + 8 μV 0.85 mV/V + 8 μV	Fluke 5790A	OEM and GIDEP
	<b>2.2 V</b> (10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz	0.28 mV/V 0.09 mV/V 0.03 mV/V 0.07 mV/V 0.07 mV/V 0.1 mV/V 0.23 mV/V 0.37 mV/V 0.85 mV/V		
	<b>7 V</b> (10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz	0.28 mV/V 0.09 mV/V 0.03 mV/V 0.07 mV/V 0.07 mV/V 0.11 mV/V 0.27 mV/V 0.57 mV/V 0.85 mV/V		
	<b>22 V</b> (10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz	0.28 mV/V 0.09 mV/V 0.04 mV/V 0.07 mV/V 0.07 mV/V 0.11 mV/V 0.27 mV/V 0.57 mV/V 0.85 mV/V		



PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Volts – Measure (cont.)	<b>70 V</b> (10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz <b>220 V</b> (10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz <b>700 V</b> 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz <b>1 000 V</b> 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz	0.28 mV/V 0.1 mV/V 0.05 mV/V 0.08 mV/V 0.08 mV/V 0.13 mV/V 0.28 mV/V 0.28 mV/V 0.1 mV/V 0.04 mV/V 0.1 mV/V 0.14 mV/V 0.06 mV/V 0.27 mV/V 0.71 mV/V 0.05 mV/V 0.18 mV/V 0.71 mV/V	Fluke 5790A	OEM and GIDEP
AC Voltage Wideband – Measure	<b>2.2 mV</b> (0.5 to 1.2) MHz (1 to 2) MHz (2 to 10) MHz (10 to 20) MHz (20 to 30) MHz <b>7 mV</b> (0.5 to 1.2) MHz (1 to 2) MHz (2 to 10) MHz (10 to 20) MHz (20 to 30) MHz <b>22 mV</b> (0.5 to 1.2) MHz (1 to 2) MHz (2 to 10) MHz (10 to 20) MHz (20 to 30) MHz <b>70 mV</b> (0.5 to 1.2) MHz (1.2 to 2) MHz (2 to 10) MHz (10 to 20) MHz (20 to 30) MHz	6.7 mV/V + 2.5 μV 6.7 mV/V + 2.5 μV 7.7 mV/V + 2.5 μV 9.0 mV/V + 2.5 μV 13 mV/V + 3.5 μV 5.7 mV/V + 8 μV 5.7 mV/V + 8 μV 6.0 mV/V + 8 μV 6.7 mV/V + 8 μV 8.7 mV/V + 8 μV 5.7 mV/V + 13 μV 5.7 mV/V + 13 μV 6.0 mV/V + 13 μV 6.7 mV/V + 13 μV 8.7 mV/V + 13 μV 5.5 mV/V + 30 μV 5.5 mV/V + 30 μV 6.0 mV/V + 30 μV 6.5 mV/V + 30 μV 8.5 mV/V + 30 μV	Fluke 5790A Option -03 (1-Year Specs)	OEM and GIDEP

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Voltage Wideband – Measure (cont.)	<b>220 mV</b> (0.5 to 1.2) MHz (1.2 to 2) MHz (2 to 10) MHz (10 to 20) MHz (20 to 30) MHz <b>700 mV</b> (0.5 to 1.2) MHz (1.2 to 2) MHz (2 to 10) MHz (10 to 20) MHz (20 to 30) MHz <b>2.2 V</b> (0.5 to 1.2) MHz (1.2 to 2) MHz (2 to 10) MHz (10 to 20) MHz (20 to 30) MHz <b>7 V</b> (0.5 to 1.2) MHz (1.2 to 2) MHz (2 to 10) MHz (10 to 20) MHz (20 to 30) MHz	4.5 mV/V + 80 $\mu$ V 4.5 mV/V + 80 $\mu$ V 5.0 mV/V + 80 $\mu$ V 5.5 mV/V + 80 $\mu$ V 7.5 mV/V + 80 $\mu$ V 4.5 mV/V + 300 $\mu$ V 4.5 mV/V + 300 $\mu$ V 5.0 mV/V + 300 $\mu$ V 5.5 mV/V + 300 $\mu$ V 7.5 mV/V + 300 $\mu$ V 4.0 mV/V + 400 $\mu$ V 4.0 mV/V + 400 $\mu$ V 4.5 mV/V + 400 $\mu$ V 5.0 mV/V + 400 $\mu$ V 7.0 mV/V + 400 $\mu$ V 4.0 mV/V + 800 $\mu$ V 4.0 mV/V + 800 $\mu$ V 4.5 mV/V + 800 $\mu$ V 5.0 mV/V + 800 $\mu$ V 7.0 mV/V + 800 $\mu$ V	Fluke 5790A Option -03 (1-Year Specs)	OEM and GIDEP
AC Current – Measure	<b>(0 to 200) <math>\mu</math>A</b> (1 to 10) Hz 10 Hz to 10 kHz (10 to 30) kHz (30 to 100) kHz <b>200 <math>\mu</math>A to 2 mA</b> (1 to 10) Hz 10 Hz to 10 kHz (10 to 30) kHz (30 to 100) kHz <b>(2 to 20) mA</b> (1 to 10) Hz 10 Hz to 10 kHz (10 to 30) kHz (30 to 100) kHz	310 $\mu$ A/A + 20 nA 300 $\mu$ A/A + 20 nA 710 $\mu$ A/A + 20 nA 4 mA/A + 20 nA 310 $\mu$ A/A + 200 nA 300 $\mu$ A/A + 200 nA 710 $\mu$ A/A + 200 nA 4 mA/A + 200 nA 310 $\mu$ A/A + 2 $\mu$ A 300 $\mu$ A/A + 2 $\mu$ A 710 $\mu$ A/A + 2 $\mu$ A 4.0 mA/A + 2 $\mu$ A	Fluke 8508A Opt 001	OEM and GIDEP



PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Current – Measure (cont.)	<b>(20 to 200) mA</b> (1 to 10) Hz 10 Hz to 10 kHz (10 to 30) kHz <b>200 mA to 2 A</b> 10 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz <b>(2 to 20) A</b> 10 Hz to 2 kHz (2 to 10) kHz	310 $\mu\text{A/A} + 20 \mu\text{A}$ 290 $\mu\text{A/A} + 20 \mu\text{A}$ 625 $\mu\text{A/A} + 20 \mu\text{A}$ 620 $\mu\text{A/A} + 200 \mu\text{A}$ 725 $\mu\text{A/A} + 200 \mu\text{A}$ 3 mA/A + 200 $\mu\text{A}$ 820 $\mu\text{A/A} + 2 \text{ mA}$ 2.5 mA/A + 2 mA	Fluke 8508A Opt 001	OEM and GIDEP
AC Current – Source	<b>(0.22 to 2.2) mA</b> (10 to 20) Hz (20 to 40) Hz (0.04 to 1) kHz (1 to 5) kHz (5 to 10) kHz <b>(22 to 220) mA</b> (10 to 20) Hz (20 to 40) Hz (0.04 to 1) kHz (1 to 5) kHz (5 to 10) kHz <b>(0.22 to 2.2) A</b> (0 to 1 000) Hz (1 to 5) kHz (5 to 10) kHz <b>(2 to 3) A</b> (10 to 45) Hz (0.045 to 1) kHz (1 to 5) kHz (5 to 10) kHz <b>(3 to 11) A</b> (45 to 100) Hz (0.1 to 1) kHz (1 to 5) kHz <b>(11 to 20.5) A</b> (45 to 100) Hz (0.1 to 1) kHz (1 to 5) kHz <b>(20.5 to 1 000) A</b> (45 to 65) Hz	313 $\mu\text{A/A} + 40 \text{ nA}$ 220 $\mu\text{A/A} + 35 \text{ nA}$ 153 $\mu\text{A/A} + 35 \text{ nA}$ 240 $\mu\text{A/A} + 110 \text{ nA}$ 1.27 mA/A + 650 nA 299 $\mu\text{A/A} + 4.0 \mu\text{A}$ 200 $\mu\text{A/A} + 3.5 \mu\text{A}$ 153 $\mu\text{A/A} + 2.5 \mu\text{A}$ 240 $\mu\text{A/A} + 3.5 \mu\text{A}$ 1.27 mA/A + 10 $\mu\text{A}$ 309 $\mu\text{A/A} + 35 \mu\text{A}$ 525 $\mu\text{A/A} + 80 \mu\text{A}$ 8.09 mA/A + 160 $\mu\text{A}$ 2.10 $\mu\text{m/A} + 100 \mu\text{A}$ 746 $\mu\text{A/A} + 100 \mu\text{A}$ 6.9 mA/A + 1 mA 28.9 mA/A + 5 mA 738 $\mu\text{A/A} + 2 \text{ mA}$ 1.18 mA/A + 2 mA 34.6 mA/A + 2 mA 1.41 mA/A + 5 mA 1.74 mA/A + 5 mA 34.6 mA/A + 5 mA 90 mA/A + 500 mA	Fluke 5720A	OEM and GIDEP



PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Inductance – Source	1 kHz Test Frequency 1 mH 5 mH 500 mH 5 H 10 H	1 μH 5 μH .5 mH 5.0 mH 10.0 mH	1482E 1482G 1482N 1482R 1482T	OEM and GIDEP
Resistance – Source – Fixed Point	1 Ω 10 Ω 100 Ω 1 kΩ 10 kΩ 100 kΩ 1 MΩ 10 MΩ	4.1 μΩ 210 μΩ 1.8 mΩ 10.6 mΩ 41 mΩ 1.06 Ω 17.2 Ω 720 Ω	Guidline 9330-1 Guidline 9330-10 Guidline 9330-100 Guidline 9330-1k Guidline 9330-10k Guidline 9330-100k Guidline 9330-1M Guidline 9330-10M	OEM and GIDEP
Electrical Simulation Of Thermocouples				
Type B	(600 to 800) °C (800 to 1 000) °C (1 000 to 1 550) °C (1 550 to 1 820) °C	0.51 °C 0.39 °C 0.35 °C 0.38 °C		
Type C	(0 to 150) °C (150 to 650) °C (650 to 1 000) °C (1 000 to 1 800) °C (1 800 to 2 316) °C	0.35 °C 0.30 °C 0.36 °C 0.58 °C 0.97 °C		
Type E	(-250 to -100) °C (-100 to -25) °C (-25 to 350) °C (350 to 650) °C (650 to 1 000) °C	0.58 °C 0.19 °C 0.16 °C 0.19 °C 0.24 °C	5520A/SC1100	OEM and GIDEP
Type J	(-210 to -100) °C (-100 to -30) °C (-30 to 150) °C (150 to 760) °C (760 to 1 200) °C	0.32 °C 0.19 °C 0.17 °C 0.20 °C 0.27 °C		
Type K	(-200 to -100) °C (-100 to -25) °C (-25 to 120) °C (120 to 1 000) °C (1 000 to 1 372) °C	0.38 °C 0.21 °C 0.19 °C 0.30 °C 0.46 °C		



PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Electrical Simulation Of Thermocouples	Type N		5520A/SC1100	OEM and GIDEP
	(-200 to -100) °C	0.46 °C		
	(-100 to -25) °C	0.25 °C		
	(-25 to 120) °C	0.22 °C		
	(120 to 410) °C	0.21 °C		
	(410 to 1 300) °C	0.31 °C		
	Type R			
	(0 to 250) °C	0.66 °C		
	(250 to 400) °C	0.40 °C		
	(400 to 1 000) °C	0.38 °C		
	(1 000 to 1 767) °C	0.46 °C		
	Type S			
	(0 to 250) °C	0.54 °C		
	(250 to 1 000) °C	0.42 °C		
	(1 000 to 1 400) °C	0.43 °C		
(1 400 to 1 767) °C	0.53 °C			
Type T				
(-250 to -150) °C	0.73 °C			
(-150 to 0) °C	0.28 °C			
(0 to 120) °C	0.19 °C			
(120 to 400) °C	0.17 °C			
Type U				
(-200 to 0) °C	0.65 °C			
(0 to 600) °C	0.31 °C			
<b>Oscilloscopes</b>			Fluke 5520A/SC1100	OEM and GIDEP
DC Signal into 50 Ω Load	0 V to ± 6.6 V	2.5 mV/V + 40 μV		
DC Signal into 1 MΩ Load	0 V to ± 130 V	0.5 mV/V + 40 μV		
Amplitude Square Wave 50 Ω Load	1 mV to 6.6 Vp-p 10 Hz to 10 kHz	2.5 mV/V + 40 μV		
1 MΩ Load	1 mV to 130 Vp-p 10 Hz to 10 kHz	1 mV/V + 40 μV		
Leveled Sine Wave –Flatness	<b>[5 mV to 5.5 V]</b>			
Relative to 50 kHz	50 kHz to 100 MHz (100 to 300) MHz (300 to 600) MHz	15 mV/V + 100 μV 0.02 V/V + 100 μV 0.04 V/V + 100 μV		
	<b>5 mV to 3.5 V</b> (600 to 1 100) MHz	0.05 V/V + 100 μV		



PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
<b>Oscilloscopes (Cont.)</b>				
Time Marker into 50 Ω Load				
Spike or Square Wave Spike, Square, 20 % Pulse	5 s to 50 ms 20 ms to 100 ns	(25 + 1 000t) μs/s 2.5 μs/s		
Spike or Square Wave Square or Sine Wave Sine Wave	(50 to 20) ns 10 ns (5 to 1) ns	2.5 μs/s 2.5 μs/s 2.5 μs/s		
Edge Specs into 50 Ω Load – Source				
Rise Time Amplitude (Peak to Peak)	< 350 ps 5 mV to 2.5 V	+0 ps/-100 ps 0.02 V/V + 200 μV		
Frequency  Wave Generator – Source: Amplitude	<b>1 kHz to 10 MHz</b>	2.5 μs/s of setting	Fluke 5520A/SC1100	OEM and GIDEP
Square, Sine, Triangle into 1 MΩ Square, Sine, Triangle into 50 MΩ  Frequency	<b>10 Hz to 10 kHz</b>  1.8 mV to 55 V p-p 1.8 mV to 2.5 V p-p	0.03 V/V +100 μV 0.03 V/V + 100 μV		
Pulse Generator-Source  Width Period 50 Hz to 5 MHz	<b>10 Hz to 100 kHz</b>  (4 to 500) ns 20 ms to 200 ns	25 μHz/Hz + 15 mHz  0.05 s/s ± 2 ns 2.5 μs/s		



## II. Electromagnetic - RF/Microwave

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
RF Power – Measure	(+30 to -20) dBm 0.1 MHz to 2 GHz	0.070 dB + M (M = mismatch)	HP 8902A w/ HP 11722A	OEM and GIDEP
	(+20 to -30) dBm 100 kHz to 4.2 GHz	3.4 % + M	HP 438A w/ 8482A HP 438A w/ 8485A	
	(+20 to -30) dBm 50 MHz to 26.5 GHz 10 MHz to 18.0 GHz	3.4 % + M 3.5 % + M	HP 438A w/ 8481A	
RF Attenuation – Measure 2.5 MHz to 1.3 GHz	(0 to -10) dBm (-10 to -40) dBm (-40 to -50) dBm (-50 to -80) dBm (-80 to -90) dBm (-90 to -110) dBm (-110 to -127) dBm	0.02 dB 0.05 dB 0.12 dB 0.15 dB 0.25 dB 0.27 dB 0.42 dB	HP 8902A w/ 11722A	OEM and GIDEP
Phase Modulation – Measure Rate: (0.2 to 10) kHz Rate: (0.2 to 20) kHz	(0.15 to 10) MHz 10 MHz to 1.3 GHz	4.2 % + 1 digit 3.3 % + 1 digit	HP 8902A w/ HP 11722A	OEM and GIDEP-

## III. Thermodynamic

PARAMETER / EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Temperature Measuring Equipment Ice Point Reference	(0.00 to 0.09) °C	0.05 °C	Kaye	OEM / Internal Cal Procedures
Thermocouple/Probe Calibration Source	(35 to 250) °C (95 to 482) °F	Center Well 0.10°C @100 °C 0.10°C @250 °C	Hart 9122 Dry Well Calibrator w/ASL F250 Precision Thermometer & ASL T100-250 RTD	OEM / Internal Cal Procedure

**Notes:**

- Best Measurement Uncertainties (Expanded Uncertainty) are based on approximately a 95% confidence interval, using a coverage of  $k=2$
- This scope is part of and must be included with the Certificate of Accreditation No. AC - 1323



Vice President

