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

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CALIBRATION

Valid to: January 28, 2013 Certificate Number: AC - 1303

I. Electromagnetic - DC/Low Frequency

PARAMETER / EQUIPMENT	RANGE	CALIBRATION & MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY (±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
DC Voltage - Source	Up to 330 mV 330 mV to 3.3 V (3.3 to 33) V (33 to 330) V 330 V to 1 kV	20 µV/V + 1 µV 11 µV/V + 2 µV 12 µV/V + 20 µV 18 µV/V + 150 µV 18 µV/V + 1.5 mV	Fluke 5520A/SC 600	OEM and GIDEP Sourced Calibration Procedures
DC Voltage - Measure	Up to 100 mV 100 mV to 1 V (1 to 10) V (10 to 100) V 100 V to 1 kV	11 µV/V + 300 nV 10 µV/V + 300 nV 10 µV/V + 500 nV 12 µV/V + 30 µV 12 µV/V + 100 µV	HP 3458A	
DC Current - Source	Up to 330 µA 330 µA to 3.3 mA (3.3 to 33) mA (33 to 330) mA 330 mA to 1.1 A (1.1 to 3) A (3 to 11) A (11 to 20.5) A	150 µA/A + 20 nA 100 µA/A + 50 nA 100 µA/A + 250 nA 100 µA/A + 2.5 µA 200 µA/A + 40 µA 380 µA/A + 40 µA 500 µA/A + 500 µA 1 mA/A + 750 µA	Fluke 5520A/SC 600	

PARAMETER / EQUIPMENT	RANGE	CALIBRATION & MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY (±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
DC Current - Measure	Up to 100 nA 100 nA to 1 µA (1 to 10) µA (10 to 100) µA 100 µA to 1 mA (1 to 10) mA (10 to 100) mA 100 mA to 1 A	35 µA/A + 40 pA 25 µA/A + 40 pA 25 µA/A + 100 pA 25 µA/A + 800 pA 25 µA/A + 5 nA 25 µA/A + 50 nA 40 µA/A + 500 nA 110 µA/A + 10 µA	HP 3458A	OEM and GIDEP Sourced Calibration Procedures
Resistance - Source	(0 to 11) Ω (11 to 33) Ω (33 to 110) Ω (110 to 330) Ω 330 Ω to 1.1 kΩ (1.1 to 3.3) kΩ (3.3 to 11) kΩ (11 to 33) kΩ (33 to 110) kΩ (110 to 330) kΩ 330 kΩ to 1.1 MΩ (1.1 to 3.3) MΩ (3.3 to 11) MΩ (11 to 33) MΩ (33 to 110) MΩ (110 to 330) MΩ 330 MΩ to 1.1 GΩ	40 µΩ/Ω + 1 mΩ 30 µΩ/Ω + 1.5 mΩ 28 µΩ/Ω + 1.4 mΩ 28 µΩ/Ω + 2 mΩ 28 µΩ/Ω + 2 mΩ 28 µΩ/Ω + 20 mΩ 28 µΩ/Ω + 20 mΩ 28 µΩ/Ω + 200 mΩ 28 µΩ/Ω + 200 mΩ 32 µΩ/Ω + 2 Ω 32 µΩ/Ω + 2 Ω 60 µΩ/Ω + 30 Ω 130 µΩ/Ω + 50 Ω 250 µΩ/Ω + 2.5 kΩ 500 µΩ/Ω + 3 kΩ 3 mΩ/Ω + 100 kΩ 15 mΩ/Ω + 500 kΩ	Fluke 5520A/SC 600	
Resistance - Measure	(0 to 10) Ω (10 to 100) Ω 100 Ω to 1 kΩ (1 to 10) kΩ (10 to 100) kΩ 100 kΩ to 1 MΩ (1 to 10) MΩ (10 to 100) MΩ 100 MΩ to 1 GΩ	18 µΩ/Ω + 50 µΩ 15 µΩ/Ω + 500 µΩ 13 µΩ/Ω + 500 µΩ 13 µΩ/Ω + 5 mΩ 13 µΩ/Ω + 50 mΩ 18 µΩ/Ω + 2 Ω 53 µΩ/Ω + 100 Ω 503 µΩ/Ω + 1 kΩ 5 mΩ/Ω + 10 kΩ	HP 3458A	

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PARAMETER / EQUIPMENT	RANGE	CALIBRATION & MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY (±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Voltage - Source	**(1 to 33) mV**		Fluke 5520A/SC 600	OEM and GIDEP Sourced Calibration Procedures
	(10 to 45) Hz	800 µV/V + 6 µV		
	45 Hz to 10 kHz	150 µV/V + 6 µV		
	(10 to 20) kHz	200 µV/V + 6 µV		
	(20 to 50) kHz	1 mV/V + 6 µV		
	(50 to 100) kHz	3.5 mV/V + 12 µV		
	(100 to 500) kHz	8 mV/V + 50 µV		
	(33 to 330) mV			
	(10 to 45) Hz	300 µV/V + 8 µV		
	45 Hz to 10 kHz	145 µV/V + 8 µV		
	(10 to 20) kHz	160 µV/V + 8 µV		
	(20 to 50) kHz	350 µV/V + 8 µV		
	(50 to 100) kHz	800 µV/V + 32 µV		
	(100 to 500) kHz	2 mV/V + 70 µV		
	33 mV to 3.3 V			
	(10 to 45) Hz	300 µV/V + 50 µV		
	45 Hz to 10 kHz	150 µV/V + 60 µV		
	(10 to 20) kHz	190 µV/V + 60 µV		
	(20 to 50) kHz	300 µV/V + 50 µV		
	(50 to 100) kHz	700 µV/V + 125 µV		
	(100 to 500) kHz	2.4 mV/V + 600 µV		
	(3.3 to 33) V			
	(10 to 45) Hz	300 µV/V + 650 µV		
	45 Hz to 10 kHz	150 µV/V + 600 µV		
	(10 to 20) kHz	240 µV/V + 600 µV		
	(20 to 50) kHz	350 µV/V + 600 µV		
	(50 to 100) kHz	900 µV/V + 1.6 mV		
	(33 to 330) V			
	(10 to 45) Hz	190 µV/V + 2 mV		
	45 Hz to 10 kHz	200 µV/V + 6 mV		
	(10 to 20) kHz	250 µV/V + 6 mV		
	(20 to 50) kHz	300 µV/V + 6 mV		
	(50 to 100) kHz	2 mV/V + 50 mV		
	330 V to 1.02 kV			
	45 Hz to 1 kHz	300 µV/V + 10 mV		
	(1 to 5) kHz	250 µV/V + 10 mV		
	(5 to 10) kHz	300 µV/V + 10 mV		

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PARAMETER / EQUIPMENT	RANGE	CALIBRATION & MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY (±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Voltage - Measure	**(1 to 10) mV**		HP 3458A	OEM and GIDEP Sourced Calibration Procedures
	(1 to 40) Hz	302 µV/V + 3 µV		
	40 Hz to 1 kHz	202 µV/V + 1.1 µV		
	(1 to 20) kHz	302 µV/V + 1.1 µV		
	(20 to 50) kHz	1 mV/V + 1.1 µV		
	(50 to 100) kHz	5 mV/V + 1.1 µV		
	(100 to 300) kHz	40 mV/V + 2 µV		
	300 kHz to 1 MHz	12 mV/V + 5 µV		
	(1 to 4) MHz	70 mV/V + 7 µV		
	(4 to 8) MHz	200 mV/V + 8 µV		
	(10 to 100) mV			
	(1 to 40) Hz	72 µV/V + 4 µV		
	40 Hz to 1 kHz	72 µV/V + 2 µV		
	(1 to 20) kHz	142 µV/V + 2 µV		
	(20 to 50) kHz	302 µV/V + 2 µV		
	(50 to 100) kHz	802 µV/V + 2 µV		
	(100 to 300) kHz	3 mV/V + 10 µV		
	300 kHz to 1 MHz	10 mV/V + 10 µV		
	(1 to 2) MHz	15 mV/V + 10 µV		
	(2 to 4) MHz	40 mV/V + 70 µV		
	(4 to 8) MHz	40 mV/V + 80 µV		
	(8 to 10) MHz	150 mV/V + 100 µV		
	100 mV to 1 V			
	(1 to 40) Hz	72 µV/V + 40 µV		
	40 Hz to 1 kHz	72 µV/V + 20 µV		
	(1 to 20) kHz	142 µV/V + 20 µV		
	(20 to 50) kHz	302 µV/V + 20 µV		
	(50 to 100) kHz	802 µV/V + 20 µV		
	(100 to 300) kHz	3 mV/V + 100 µV		
	300 kHz to 1 MHz	10 mV/V + 100 µV		
	(1 to 2) MHz	15 mV/V + 100 µV		
	(2 to 4) MHz	40 mV/V + 700 µV		
	(4 to 8) MHz	40 mV/V + 800 µV		
	(8 to 10) MHz	150 mV/V + 1 mV		

PARAMETER / EQUIPMENT	RANGE	CALIBRATION & MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY (±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Voltage - Measure (cont.)	**(1 to 10) V**		HP 3458A	OEM and GIDEP Sourced Calibration Procedures
	(1 to 40) Hz	72 µV/V + 400 µV		
	40 Hz to 1 kHz	72 µV/V + 200 µV		
	(1 to 20) kHz	142 µV/V + 200 µV		
	(20 to 50) kHz	302 µV/V + 200 µV		
	(50 to 100) kHz	802 µV/V + 200 µV		
	(100 to 300) kHz	3 mV/V + 1 mV		
	300 kHz to 1 MHz	10 mV/V + 1 mV		
	(1 to 2) MHz	15 mV/V + 1 mV		
	(2 to 4) MHz	40 mV/V + 7 mV		
	(4 to 8) MHz	40 mV/V + 8 mV		
	(8 to 10) MHz	150 mV/V + 10 mV		
	(10 to 100) V			
	(1 to 40) Hz	202 µV/V + 4 mV		
	40 Hz to 1 kHz	202 µV/V + 2 mV		
	(1 to 20) kHz	202 µV/V + 2 mV		
	(20 to 50) kHz	352 µV/V + 2 mV		
	(50 to 100) kHz	1.2 mV/V + 2 mV		
	(100 to 300) kHz	4 mV/V + 10 mV		
	300 kHz to 1 MHz	15 mV/V + 10 mV		
	100 V to 1 kV			
	(1 to 40) Hz	402 µV/V + 40 mV		
	40 Hz to 1 kHz	402 µV/V + 20 mV		
	(1 to 20) kHz	602 µV/V + 20 mV		
	(20 to 50) kHz	1.2 mV/V + 20 mV		
	(50 to 100) kHz	3 mV/V + 20 mV		
AC Current - Source	**(29 to 330) µA**		Fluke 5520A/SC 600	
	(10 to 20) Hz	2 mA/A + 100 nA		
	(20 to 45) Hz	1.5 mA/A + 100 nA		
	45 Hz to 1 kHz	1.25 mA/A + 100 nA		
	(1 to 5) kHz	3 mA/A + 150 nA		
	(5 to 10) kHz	8 mA/A + 200 nA		
	(10 to 30) kHz	16 mA/A + 400 nA		

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PARAMETER / EQUIPMENT	RANGE	CALIBRATION & MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY (±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Current - Source (cont.)	**33 µA to 3.3 mA**		Fluke 5520A/SC 600	OEM and GIDEP Sourced Calibration Procedures
	(10 to 20) Hz	2 mA/A + 150 nA		
	(20 to 45) Hz	1.25 mA/A + 150 nA		
	45 Hz to 1 kHz	1 mA/A + 150 nA		
	(1 to 5) kHz	2 mA/A + 200 nA		
	(5 to 10) kHz	5 mA/A + 300 nA		
	(10 to 30) kHz	10 mA/A + 600 nA		
	(3.3 to 33) mA			
	(10 to 20) Hz	1.8 mA/A + 2 µA		
	(20 to 45) Hz	900 µA/A + 2 µA		
	45 Hz to 1 kHz	400 µA/A + 2 µA		
	(1 to 5) kHz	800 µA/A + 2 µA		
	(5 to 10) kHz	2 mA/A + 3 µA		
	(10 to 30) kHz	4 mA/A + 4 µA		
	(33 to 330) mA			
	(10 to 20) Hz	1.8 mA/A + 20 µA		
	(20 to 45) Hz	900 µA/A + 20 µA		
	45 Hz to 1 kHz	400 µA/A + 20 µA		
	(1 to 5) kHz	1 mA/A + 50 µA		
	(5 to 10) kHz	2 mA/A + 100 µA		
	(10 to 30) kHz	4 mA/A + 200 µA		
	33 mA to 1.1 A			
	(10 to 45) Hz	1.8 mA/A + 100 µA		
	45 Hz to 1 kHz	500 µA/A + 100 µA		
	(1 to 5) kHz	6 mA/A + 1 mA		
	(5 to 10) kHz	25 mA/A + 5 mA		
	(1.1 to 3) A			
	(10 to 45) Hz	1.8 mA/A + 100 µA		
	45 Hz to 1 kHz	600 µA/A + 100 µA		
	(1 to 5) kHz	6 mA/A + 1 mA		
	(5 to 10) kHz	25 mA/A + 5 mA		
	(3 to 11) A			
	(45 to 100) Hz	600 µA/A + 2 mA		
	100 Hz to 1 kHz	1 mA/A + 2 mA		
	(1 to 5) kHz	30 mA/A + 2 mA		
	(11 to 20.5) A			
	(45 to 100) Hz	1.2 mA/A + 5 mA		
	100 Hz to 1 kHz	1.5 mA/A + 5 mA		
	(1 to 5) kHz	30 mA/A + 5 mA		

PARAMETER / EQUIPMENT	RANGE	CALIBRATION & MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY (±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Current - Measure	**(5 to 100) nA**		HP 3458A	OEM and GIDEP Sourced Calibration Procedures
	(10 to 20) Hz	4 mA/A + 30 nA		
	(20 to 45) Hz	1.5 mA/A + 30 nA		
	(45 to 100) Hz	600 µA/A + 30 nA		
	100 Hz to 5 kHz	600 µA/A + 30 nA		
	100 nA to 1 mA			
	(10 to 20) Hz	4 mA/A + 200 nA		
	(20 to 45) Hz	1.5 mA/A + 200 nA		
	(45 to 100) Hz	600 µA/A + 200 nA		
	100 Hz to 5 kHz	300 µA/A + 200 nA		
	(5 to 20) kHz	600 µA/A + 200 nA		
	(20 to 50) kHz	4 mA/A + 400 nA		
	(50 to 100) kHz	5.5 mA/A + 1.5 µA		
	(1 to 10) mA			
	(10 to 20) Hz	4 mA/A + 2 µA		
	(20 to 45) Hz	1.5 mA/A + 2 µA		
	(45 to 100) Hz	600 µA/A + 2 µA		
	100 Hz to 5 kHz	300 µA/A + 2 µA		
	(5 to 20) kHz	600 µA/A + 2 µA		
	(20 to 50) kHz	4 mA/A + 4 µA		
	(50 to 100) kHz	5.5 mA/A + 15 µA		
	(10 to 100) mA			
	(10 to 20) Hz	4 mA/A + 20 µA		
	(20 to 45) Hz	1.5 mA/A + 20 µA		
	(45 to 100) Hz	600 µA/A + 20 µA		
	100 Hz to 5 kHz	300 µA/A + 20 µA		
	(5 to 20) kHz	600 µA/A + 20 µA		
	(20 to 50) kHz	4 mA/A + 40 µA		
	(50 to 100) kHz	5.5 mA/A + 150 µA		
	100 mA to 1 A			
	(10 to 20) Hz	4 mA/A + 200 µA		
	(20 to 45) Hz	1.6 mA/A + 200 µA		
	(45 to 100) Hz	800 µA/A + 200 µA		
	100 Hz to 5 kHz	1 mA/A + 200 µA		
	(5 to 20) kHz	3 mA/A + 200 µA		
	(20 to 50) kHz	10 mA/A + 400 µA		

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Capacitance - Source			Fluke 5520A/SC 600	OEM and GIDEP Sourced Calibration Procedures
10 Hz to 10 kHz	(190 to 400) pF	5 mF/F + 10 pF		
10 Hz to 10 kHz	400 pF to 1.1 nF	5 mF/F + 10 pF		
10 Hz to 3 kHz	(1.1 to 3.3) nF	5 mF/F + 10 pF		
10 Hz to 1 kHz	(3.3 to 11) nF	2.5 mF/F + 10 pF		
10 Hz to 1 kHz	(11 to 33) nF	2.5 mF/F + 100 pF		
10 Hz to 1 kHz	(33 to 110) nF	2.5 mF/F + 100 pF		
10 Hz to 1 kHz	(110 to 330) nF	2.5 mF/F + 300 pF		
(10 to 600) Hz	330 nF to 1.1 µF	2.5 mF/F + 1 nF		
(10 to 300) Hz	(1.1 to 3.3) µF	2.5 mF/F + 3 nF		
(10 to 150) Hz	(3.3 to 11) µF	2.5 mF/F + 10 nF		
(10 to 120) Hz	(11 to 33) µF	4 mF/F + 30 nF		
(10 to 80) Hz	(33 to 110) µF	4.5 mF/F + 100 nF		
Up to 50 Hz	(110 to 330) µF	4.5 mF/F + 300 nF		
Up to 20 Hz	330 µF to 1.1 mF	4.5 mF/F + 1 µF		
Up to 6 Hz	(1.1 to 3.3) mF	4.5 mF/F + 3 µF		
Up to 2 Hz	(3.3 to 11) mF	4.5 mF/F + 10 µF		
Up to 0.6 Hz	(11 to 33) mF	7.5 mF/F + 30 µF		
Up to 0.2 Hz	(33 to 110) mF	11 mF/F + 100 µF		
Electrical Simulation of Thermocouple Indicators				
Type B	(600 to 800) °C	0.44 °C		
	(800 to 1 000) °C	0.34 °C		
	(1 000 to 1 550) °C	0.3 °C		
	(1 550 to 1 820) °C	0.33 °C		
Type C	(0 to 150) °C	0.3 °C		
	(150 to 650) °C	0.26 °C		
	(650 to 1 000) °C	0.31 °C		
	(1 000 to 1 800) °C	0.5 °C		
	(1 800 to 2 316) °C	0.84 °C		
Type E	(-250 to -100) °C	0.5 °C		
	(-100 to -25) °C	0.16 °C		
	(-25 to 350) °C	0.14 °C		
	(350 to 650) °C	0.16 °C		
	(650 to 1 000) °C	0.21 °C		

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Electrical Simulation of Thermocouple Indicators (cont.)			Fluke 5520A/SC 600	OEM and GIDEP Sourced Calibration Procedures
Type J	(-210 to -100) °C	0.27 °C		
	(-100 to -30) °C	0.16 °C		
	(-30 to 150) °C	0.14 °C		
	(150 to 760) °C	0.17 °C		
	(760 to 1 200) °C	0.23 °C		
Type K	(-200 to -100) °C	0.33 °C		
	(-100 to -25) °C	0.18 °C		
	(-25 to 120) °C	0.16 °C		
	(120 to 1 000) °C	0.26 °C		
	(1 000 to 1 372) °C	0.4 °C		
Type L	(-200 to -100) °C	0.37 °C		
	(-100 to 800) °C	0.26 °C		
	(800 to 900) °C	0.17 °C		
Type N	(-200 to -100) °C	0.4 °C		
	(-100 to -25) °C	0.22 °C		
	(-25 to 120) °C	0.19 °C		
	(120 to 410) °C	0.18 °C		
	(410 to 1 300) °C	0.27 °C		
Type R	(0 to 250) °C	0.57 °C		
	(250 to 400) °C	0.35 °C		
	(400 to 1 000) °C	0.33 °C		
	(1 000 to 1 767) °C	0.4 °C		
Type S	(0 to 250) °C	0.47 °C		
	(250 to 1 000) °C	0.36 °C		
	(1 000 to 1 400) °C	0.37 °C		
	(1 400 to 1 767) °C	0.46 °C		
Type T	(-250 to -150) °C	0.63 °C		
	(-150 to 0) °C	0.24 °C		
	(0 to 120) °C	0.16 °C		
	(120 to 400) °C	0.14 °C		

PARAMETER / EQUIPMENT	RANGE	CALIBRATION & MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY (±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Electrical Simulation of Thermocouple Indicators (cont.) Type U	(-200 to 0) °C (0 to 600) °C	0.56 °C 0.27 °C	Fluke 5520A/SC 600	OEM and GIDEP Sourced Calibration Procedures
Electrical Simulation of RTDs Pt 385 (100 Ω)	(-200 to 0) °C (0 to 100) °C (100 to 300) °C (300 to 400) °C (400 to 630) °C (630 to 800) °C	0.05 °C 0.07 °C 0.09 °C 0.1 °C 0.12 °C 0.23 °C		
Pt 3926 (100 Ω)	(-200 to 0) °C (0 to 100) °C (100 to 300) °C (300 to 400) °C (400 to 630) °C	0.05 °C 0.07 °C 0.09 °C 0.1 °C 0.12 °C		
Pt 3916 (100 Ω)	(-200 to -190) °C (-190 to -80) °C (-80 to 0) °C (0 to 100) °C (100 to 260) °C (260 to 300) °C (300 to 400) °C (400 to 600) °C (600 to 630) °C	0.25 °C 0.04 °C 0.05 °C 0.06 °C 0.07 °C 0.08 °C 0.09 °C 0.1 °C 0.23 °C		
Pt 385 (200 Ω)	(-200 to 100) °C (100 to 260) °C (260 to 300) °C (300 to 400) °C (400 to 600) °C (600 to 630) °C	0.04 °C 0.05 °C 0.12 °C 0.13 °C 0.14 °C 0.16 °C		

PARAMETER / EQUIPMENT	RANGE	CALIBRATION & MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY (±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Electrical Simulation of RTDs (cont)			Fluke 5520A/SC 600	OEM and GIDEP Sourced Calibration
Pt 385 (500 Ω)	(-200 to -80) °C	0.04 °C		
	(-80 to 100) °C	0.05 °C		
	(100 to 260) °C	0.06 °C		
	(260 to 400) °C	0.08 °C		
	(400 to 600) °C	0.09 °C		
	(600 to 630) °C	0.11 °C		
Pt 385 (1 000 Ω)	(-200 to 0) °C	0.03 °C		
	(0 to 100) °C	0.04 °C		
	(100 to 260) °C	0.05 °C		
	(260 to 300) °C	0.06 °C		
	(300 to 600) °C	0.07 °C		
	(600 to 630) °C	0.23 °C		
PtNi 385 (120 Ω)	(-80 to 100) °C	0.08 °C		
	(100 to 260) °C	0.14 °C		
Oscilloscopes				
Amplitude DC Signal				
into 50 Ω Load	(-6.6 to 6.6) V	2.5 mV/V + 40 µV		
into 1 MΩ Load	(-130 to 130) V	500 µV/V + 40 µV		
Square Wave				
50 Ω Load	±1 mV to ±6.6 V p-p 10 Hz to 10 kHz	2.5 mV/V + 40 µV		
1 MΩ Load	±1 mV to ±130 V p-p 10 Hz to 1 kHz	1 mV/V + 40 µV		
	(1 to 10) kHz			
Rise Time	<300 ps	+0 ps/-100 ps		
Leveled Sine Wave	50 kHz Reference	2 mV/V + 300 µV		
Relative to 50 kHz	50 kHz to 100 MHz	3.5 mV/V + 300 µV		
[5 mV to 5.5 V] p-p	(100 to 300) MHz	4 mV/V + 300 µV		
	(300 to 600) MHz	6 mV/V + 300 µV		
Time Marker into	5 s to 50 ms	(25 + 1 000t) µs/s		
50 Ω Load-Source	20 ms to 2 ns	2.5 µs/s		

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PARAMETER / EQUIPMENT	RANGE	CALIBRATION & MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY (±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Oscilloscopes (cont.) Wave Generator - Source Amplitude (10 Hz to 10 kHz) Square, Sine, Triangle into 1 MΩ Square, Sine, Triangle into 50 Ω	 1.8 mV to 55 V p-p 1.8 mV to 2.5 V p-p	 30 mV/V + 100 µV 30 mV/V + 100 µV	Fluke 5520A/SC 600	OEM and GIDEP Sourced Calibration Procedures

II. Electromagnetic - RF / Microwave

PARAMETER / EQUIPMENT	RANGE	CALIBRATION & MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY (±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
RF Power - Measure 50 Ω load	**(+30 to -20) dBm** 150 kHz to 1.3 GHz **(+20 to -30) dBm** 110 kHz to 4.2 GHz, 50 MHz to 26.5 GHz **(+20 to -10 dBm)** 50 MHz to 18 GHz **(-20 to -70) dBm** 50 MHz to 18 GHz	 0.07 dB 0.07 dB 0.12 dB 0.10 dB 0.11 dB	 HP 8902A w/11722A HP 438A w/8482A HP 438A w/ 8485A HP 438A w/8481A HP 438A w/8484A	OEM and GIDEP Sourced Calibration Procedures
Power Reference ˉ 50 MHz	1 mW	0.07 dB (0.016 mW)	HP 8902A w/ 11722A	
Phase Modulation-Measure Carrier Frequency: 150 kHz to 10 MHz 10 MHz to 1.3 GHz	 200 Hz to 10 kHz 200 Hz to 20 kHz	 5 % 4 %	HP 8902A w/ 11722A	
Amplitude Modulation Measure Rate: 20 Hz to 10 kHz up to 99% 50 Hz to 10 kHz (5 to 99)% 20 Hz to 10 kHz up to 99% 50 Hz to 10 kHz (5 to 99)%	 150 kHz to 10 MHz 150 kHz to 10 MHz 10 MHz to 1.3 GHz 10 MHz to 1.3 GHz	 3.5 % 2.3 % 3.5 % 1.2 %	HP 8902A w/ 11722A	

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PARAMETER / EQUIPMENT	RANGE	CALIBRATION & MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY (±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Frequency Modulation - Measure Modulation Rate: 20 Hz to 10 kHz 50 Hz to 100 kHz 20 Hz to 200 kHz	 250 kHz to 10 MHz 10 MHz to 1.3 GHz 10 MHz to 1.3 GHz	 2.4 % 1.3 % 5.8 %	HP 8902A	OEM and GIDEP Sourced Calibration Procedures
Insertion Loss (0 to 110) dB (0 to 30) dB (0 to 30) dB	2.5 MHz to 1.3 GHz 50 MHz to 18 GHz 50 MHz to 26.5 GHz	0.13 dB 0.1 dB 0.12 dB	HP 8902A w/ 11722A HP 438A w/ 8481A HP 438A w/ 8485A	

III. Time & Frequency

PARAMETER / EQUIPMENT	RANGE	CALIBRATION & MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY (±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Frequency - Source*	10 MHz	2.3 parts in 10^{-12} Hz	Datum 9390	OEM and GIDEP Sourced Calibration Procedures
Frequency - Measure*	DC to 225 MHz (0.225 to 26.5) GHz	1.15 parts in 10^{-8} Hz 1.15 parts in 10^{-8} Hz	Datum 9390 w/ 53132A Datum 9390 w/ 548B	

IV. Thermodynamic

PARAMETER / EQUIPMENT	RANGE	CALIBRATION & MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY (±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Temperature - Measure	(0 to 250) ˚C	0.007 ˚C	Ertco Hart PRT	OEM and GIDEP Sourced Calibration Procedures
Temperature - Source	(0 to 125) ˚C	0.12 ˚C	Techne DB45M w/ PRT	

V. Mechanical

PARAMETER / EQUIPMENT	RANGE	CALIBRATION & MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY (±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Pressure* Pressure	(0 to 30) in H_2O (0 to 2 500) psi (2 500 to 10 000) psi	0.004 % of reading 0.004 % of reading 0.12 % of reading	Ruska 7250 lp Ruska 7250 xi Ametek R-100	OEM and GIDEP Sourced Calibration Procedures
Torque	Up to 2 000 ft lb	0.44 % of reading	AKO Torque System	
Scales and Balances	Up to 210 g 210 g to 2.1 kg (2.1 to 50) kg	0.21 mg 12 mg 120 mg	Class 1 and 2 Weights	
Mass*	Up to 200 g 200 g to 5 kg (5 to 10) kg	0.21 mg 180 mg 1.22 g	Mettler AT250 with Standard Weights Scientech 550 with Standard Weights Mettler P10N with Standard Weights	

VI. Dimensional

PARAMETER / EQUIPMENT	RANGE	CALIBRATION & MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY (±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Gage Blocks*	Up to 4 in (4 to 20) in	(1.4 + 0.5 *L*) µin (1 + *L*) µin	Tesa Comparator and Master Gage Blocks	OEM and GIDEP Sourced Calibration Procedures
Thread Plug Gages	(0.8 to 10) in	78 µin	Bench Micrometer and Thread Wires	
Plain Plug Gages	Up to 10 in	68 µin	Bench Micrometer	
Plain Ring Gages	Up to 4 in	28 µin	Helios UMG-5 w/Master Rings	
Micrometers	Up to 4 in (4 to 84) in	(59 + 2 *L*) µin (77 + 7.3 *L*) µin	Grades 1 and 2 Gage Blocks	

PARAMETER / EQUIPMENT	RANGE	CALIBRATION & MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY (±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Calipers	Up to 4 in (4 to 84) in	(118 + *L*) µin (543 + 4 *L*) µin	Grades 1 and 2 Gage Blocks	OEM and GIDEP Sourced Calibration Procedures
Height Gages	Up to 36 in	(45 + 7 *L*) µin		
Indicators	(0 to 4) in	(62 + 2 *L*) µin		
Surface Plates Flatness Repeatability	(8x8 to 144x144) in (8x8 to 144x144) in	20.3 µin 21 µin	Wyler Leveling System Repeat-o-Meter	
Angle Measurement* Angle Gage Block Protractors	1 sec to 90 deg 1 sec to 90 deg	5.88 sec 6.93 min	Angle Gage Block with Comparator Angle Gage Block	
Optical Comparators	Up to 12 in	120 µin	Quality Vision Magnification Check Kit and Grade 2 Gage Blocks	

Notes:

1. *Calibration and Measurement Capabilities (CMC) (Expanded Uncertainties) are based on approximately a 95% confidence interval, using a coverage of k=2.*
2. *This laboratory offers calibrations in its laboratory and on-site at customer-designated locations. Since on-site conditions are typically more variable than those in the laboratory, larger measurement uncertainties are expected on-site than what is reported on the accredited scope.*
3. *Capabilities denoted by an asterisk (*) are performed in the laboratory only and are not available for on-site calibration activity.*
4. *The use of (L) signifies an expression of Length in inches.*
5. *The use of (t) signifies an expression of Time in seconds.*
6. *The CMC listed for Electromagnetic - DC/Low Frequency and RF/Microwave, and Time & Frequency do not include possible contributions to uncertainty from a "best available" unit under test.*
7. *This scope is part of and must be included with the Certificate of Accreditation No. AC-1303.*

Vice President

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