



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

For Subcontractor Schedule B

**CALIBRATION**

Valid to: June 15, 2009

Certificate Number: AC-1272

**I. Electromagnetic DC/Low Frequency**

PARAMETER/ EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
DC Voltage – Source <sup>8</sup>	(0 to 220) mV (0.22 to 2.2) V (2.2 to 11) V (11 to 22) V (22 to 220) V (220 to 1100) V	11.9 $\mu\text{V}/\text{V} + 0.4 \mu\text{V}$ 5.8 $\mu\text{V}/\text{V} + 0.7 \mu\text{V}$ 4.2 $\mu\text{V}/\text{V} + 2.5 \mu\text{V}$ 4.1 $\mu\text{V}/\text{V} + 4 \mu\text{V}$ 5.8 $\mu\text{V}/\text{V} + 40 \mu\text{V}$ 7.6 $\mu\text{V}/\text{V} + 400 \mu\text{V}$	Fluke 5720A	OEM and GIDEP
DC Voltage – Measure <sup>8</sup>	(0 to 100) mV (0.1 to 1) V (1 to 10) V (10 to 100) V (100 to 1000) V  (1 to 10) kV (10 to 100) kV	7.8 $\mu\text{V}/\text{V} + 0.8 \mu\text{V}$ 5.7 $\mu\text{V}/\text{V} + 0.8 \mu\text{V}$ 5.6 $\mu\text{V}/\text{V} + 1.0 \mu\text{V}$ 7.9 $\mu\text{V}/\text{V} + 80 \mu\text{V}$ 7.9 $\mu\text{V}/\text{V} + 150 \mu\text{V}$  0.06 kV 0.6 kV	Agilent 3458A OPT002  Hipotronics KVM-100	OEM and GIDEP
DC Current – Source <sup>8</sup>	(0 to 220) $\mu\text{A}$ (0.22 to 2.2) mA (2.2 to 22) mA (22 to 220) mA (220 to 2.2) A  (2.2 to 11) A (11 to 20.5) A  (20.5 to 1000) A	118.0 $\mu\text{A}/\text{A} + 6 \text{ nA}$ 41.6 $\mu\text{A}/\text{A} + 7 \text{ nA}$ 40.7 $\mu\text{A}/\text{A} + 40 \text{ nA}$ 52.2 $\mu\text{A}/\text{A} + 0.7 \mu\text{A}$ 92.8 $\mu\text{A}/\text{A} + 12 \mu\text{A}$  582 $\mu\text{A}/\text{A} + 500 \mu\text{A}$ 1211 $\mu\text{A}/\text{A} + 750 \mu\text{A}$  86 mA/A + 500 mA	Fluke 5720A  Fluke 5520A  Fluke 5520A w/ 50-turn coil	OEM and GIDEP



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DC Current – Measure <sup>8</sup>	(0 to 100) nA (0.1 to 1) $\mu$ A (1 to 10) $\mu$ A (10 to 100) $\mu$ A (0.1 to 1) mA (1 to 10) mA (10 to 100) mA (0.1 to 1) A	47.9 $\mu$ A/A + 65 pA 35.1 $\mu$ A/A + 65 pA 35.1 $\mu$ A/A + 150 pA 35.1 $\mu$ A/A + 1.3 nA 35.0 $\mu$ A/A + 10 nA 35.8 $\mu$ A/A + 100nA 14.4 $\mu$ A/A + 1 $\mu$ A 140 $\mu$ A/A + 20 $\mu$ A	Agilent 3458A OPT002	OEM and GIDEP
	(1 to 10) A	2394 $\mu$ A/A + 700 $\mu$ A	Fluke 45	
Resistance – Source <sup>8</sup>	0 $\Omega$	113.2 $\mu\Omega$	Fluke 5720A	OEM and GIDEP
	1 $\Omega$	113.2 $\mu\Omega$		
	1.9 $\Omega$	211.5 $\mu\Omega$		
	10 $\Omega$	268.8 $\mu\Omega$		
	19 $\Omega$	510.4 $\mu\Omega$		
	100 $\Omega$	1355 $\mu\Omega$		
	190 $\Omega$	2568 $\mu\Omega$		
	1 k $\Omega$	11.1 m $\Omega$		
	1.9 k $\Omega$	21.0 m $\Omega$		
	10 k $\Omega$	110.8 m $\Omega$		
	19 k $\Omega$	209.6 m $\Omega$		
	100 k $\Omega$	1279 m $\Omega$		
	190 k $\Omega$	2672 m $\Omega$		
	1 M $\Omega$	24.2 $\Omega$		
	1.9 M $\Omega$	48.0 $\Omega$		
	10 M $\Omega$	472.7 $\Omega$		
19 M $\Omega$	1113 $\Omega$			
100 M $\Omega$	22.9 k $\Omega$			
1 G $\Omega$	1.9 M $\Omega$	IET Labs HRRS Decade Box		
10 G $\Omega$	46.3 M $\Omega$			
100 G $\Omega$	945 M $\Omega$			
Resistance – Measure <sup>8</sup>	(0 to 10) $\Omega$	24.0 $\mu\Omega/\Omega$ + 100 $\mu\Omega$	Agilent 3458A OPT002	OEM and GIDEP
	(10 to 100) $\Omega$	20.2 $\mu\Omega/\Omega$ + 1000 $\mu\Omega$		
	(0.1 to 1) k $\Omega$	17.5 $\mu\Omega/\Omega$ + 1 m $\Omega$		
	(1 to 10) k $\Omega$	17.4 $\mu\Omega/\Omega$ + 10 m $\Omega$		
	(10 to 100) k $\Omega$	17.5 $\mu\Omega/\Omega$ + 100 m $\Omega$		
	(0.1 to 1) M $\Omega$	23.4 $\mu\Omega/\Omega$ + 7 m $\Omega$		
	(1 to 10) M $\Omega$	87.1 $\mu\Omega/\Omega$ + 200 m $\Omega$		
	(10 to 100) M $\Omega$	723.4 $\mu\Omega/\Omega$ + 2 $\Omega$		
	(0.1 to 1) G $\Omega$	7217 $\mu\Omega/\Omega$ + 20 k $\Omega$		



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AC Voltage – Source <sup>8</sup>	(0 to 2.2) mV (10 to 20) Hz (20 to 40) Hz (0.04 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz (0.5 to 1) MHz	2351 $\mu\text{V/V} + 4 \mu\text{V}$ 2337 $\mu\text{V/V} + 4 \mu\text{V}$ 2170 $\mu\text{V/V} + 4 \mu\text{V}$ 2181 $\mu\text{V/V} + 4 \mu\text{V}$ 2244 $\mu\text{V/V} + 5 \mu\text{V}$ 2484 $\mu\text{V/V} + 10 \mu\text{V}$ 2705 $\mu\text{V/V} + 20 \mu\text{V}$ 3798 $\mu\text{V/V} + 20 \mu\text{V}$	Fluke 5720A	OEM and GIDEP
	(2.2 to 22) mV (10 to 20) Hz (20 to 40) Hz (0.04 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz (0.5 to 1) MHz	612 $\mu\text{V/V} + 4 \mu\text{V}$ 555 $\mu\text{V/V} + 4 \mu\text{V}$ 361 $\mu\text{V/V} + 4 \mu\text{V}$ 418 $\mu\text{V/V} + 4 \mu\text{V}$ 694 $\mu\text{V/V} + 5 \mu\text{V}$ 1293 $\mu\text{V/V} + 10 \mu\text{V}$ 1678 $\mu\text{V/V} + 20 \mu\text{V}$ 3351 $\mu\text{V/V} + 20 \mu\text{V}$		
	(22 to 220) mV (10 to 20) Hz (20 to 40) Hz (0.04 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz (0.5 to 1) MHz	289 $\mu\text{V/V} + 12 \mu\text{V}$ 132 $\mu\text{V/V} + 7 \mu\text{V}$ 109 $\mu\text{V/V} + 7 \mu\text{V}$ 238 $\mu\text{V/V} + 7 \mu\text{V}$ 537 $\mu\text{V/V} + 17 \mu\text{V}$ 1045 $\mu\text{V/V} + 20 \mu\text{V}$ 1620 $\mu\text{V/V} + 25 \mu\text{V}$ 3276 $\mu\text{V/V} + 45 \mu\text{V}$		
	(0.22 to 2.2) V (10 to 20) Hz (20 to 40) Hz (0.04 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz (0.5 to 1) MHz (2.2 to 22) V (10 to 20) Hz (20 to 40) Hz (0.04 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz (0.5 to 1) MHz	279 $\mu\text{V/V} + 40 \mu\text{V}$ 108 $\mu\text{V/V} + 15 \mu\text{V}$ 55 $\mu\text{V/V} + 8 \mu\text{V}$ 119 $\mu\text{V/V} + 10 \mu\text{V}$ 130 $\mu\text{V/V} + 30 \mu\text{V}$ 487 $\mu\text{V/V} + 80 \mu\text{V}$ 1158 $\mu\text{V/V} + 200 \mu\text{V}$ 1967 $\mu\text{V/V} + 300 \mu\text{V}$ 279 $\mu\text{V/V} + 400 \mu\text{V}$ 108 $\mu\text{V/V} + 150 \mu\text{V}$ 56 $\mu\text{V/V} + 50 \mu\text{V}$ 119 $\mu\text{V/V} + 100 \mu\text{V}$ 119 $\mu\text{V/V} + 200 \mu\text{V}$ 321 $\mu\text{V/V} + 600 \mu\text{V}$ 1158 $\mu\text{V/V} + 2 \text{ mV}$ 1741 $\mu\text{V/V} + 3.2 \text{ mV}$		

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AC Voltage – Source <sup>8</sup> (cont.)	(22 to 220) V (10 to 20) Hz (20 to 40) Hz (0.04 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz (0.5 to 1) MHz	279 $\mu\text{V/V} + 4.0 \text{ mV}$ 109 $\mu\text{V/V} + 1.5 \text{ mV}$ 65 $\mu\text{V/V} + 0.6 \text{ mV}$ 123 $\mu\text{V/V} + 1.0 \text{ mV}$ 176 $\mu\text{V/V} + 2.5 \text{ mV}$ 1040 $\mu\text{V/V} + 16 \text{ mV}$ 5081 $\mu\text{V/V} + 40 \text{ mV}$ 9240 $\mu\text{V/V} + 80 \text{ mV}$	Fluke 5720A	OEM and GIDEP
	(220 to 1 100) V (15 to 50) Hz (0.05 to 1) kHz	348 $\mu\text{V/V} + 16 \text{ mV}$ 88 $\mu\text{V/V} + 3.5 \text{ mV}$		
AC Voltage – Measure <sup>8</sup> Bandwidth < 2 MHz	(0 to 10) mV (1 to 40) Hz (0.04 to 1) kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz	463 $\mu\text{V/V} + 13 \mu\text{V}$ 348 $\mu\text{V/V} + 11.1 \mu\text{V}$ 463 $\mu\text{V/V} + 11.1 \mu\text{V}$ 1271 $\mu\text{V/V} + 11.1 \mu\text{V}$ 5890 $\mu\text{V/V} + 11.1 \mu\text{V}$ 46 $\mu\text{V/V} + 12 \mu\text{V}$		
	(10 to 100) mV (1 to 40) Hz (0.04 to 1) kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (0.3 to 1) MHz (1 to 2) MHz	140 $\mu\text{V/V} + 4.5 \mu\text{V}$ 143 $\mu\text{V/V} + 2.5 \mu\text{V}$ 222 $\mu\text{V/V} + 2.5 \mu\text{V}$ 407 $\mu\text{V/V} + 2.5 \mu\text{V}$ 984 $\mu\text{V/V} + 2.5 \mu\text{V}$ 3525 $\mu\text{V/V} + 10.5 \mu\text{V}$ 11.6 $\text{mV/V} + 10.5 \mu\text{V}$ 17.4 $\text{mV/V} + 10.5 \mu\text{V}$	Agilent 3458A OPT002	OEM and GIDEP
	(0.1 to 1) V (1 to 40) Hz (0.04 to 1) kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (0.3 to 1) MHz (1 to 2) MHz	139 $\mu\text{V/V} + 45 \mu\text{V}$ 139 $\mu\text{V/V} + 25 \mu\text{V}$ 220 $\mu\text{V/V} + 25 \mu\text{V}$ 406 $\mu\text{V/V} + 25 \mu\text{V}$ 982 $\mu\text{V/V} + 25 \mu\text{V}$ 3523 $\mu\text{V/V} + 105 \mu\text{V}$ 11.6 $\text{mV/V} + 105 \mu\text{V}$ 17.4 $\text{mV/V} + 105 \mu\text{V}$		

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AC Voltage – Measure <sup>8</sup> Bandwidth < 2 MHz (cont.)	(1 to 10) V					
	(1 to 40) Hz	139 $\mu$ V/V + 450 $\mu$ V	Agilent 3458A OPT002	OEM and GIDEP		
	(0.04 to 1) kHz	139 $\mu$ V/V + 250 $\mu$ V				
	(1 to 20) kHz	220 $\mu$ V/V + 250 $\mu$ V				
	(20 to 50) kHz	405 $\mu$ V/V + 250 $\mu$ V				
	(50 to 100) kHz	982 $\mu$ V/V + 250 $\mu$ V				
	(100 to 300) kHz	3.5 mV/V + 1.05 mV				
	(0.3 to 1) MHz	11.6 mV/V + 1.05 mV				
	(1 to 2) MHz	17.4 mV/V + 1.05 mV				
	(10 to 100) V					
(1 to 40) Hz	290 $\mu$ V/V + 4.5 mV					
(0.04 to 1) kHz	289 $\mu$ V/V + 2.5 mV					
(1 to 20) kHz	289 $\mu$ V/V + 2.5 mV					
(20 to 50) kHz	289 $\mu$ V/V + 2.5 mV					
(50 to 100) kHz	1444 $\mu$ V/V + 2.5 mV					
(100 to 300) kHz	4.7 mV/V + 10.5 mV					
(0.3 to 1) MHz	17.4 mV/V + 10.5 mV					
(100 to 1 000) V						
(1 to 40) Hz	520 $\mu$ V/V + 45 mV					
(0.04 to 1) kHz	520 $\mu$ V/V + 25 mV					
(1 to 20) kHz	751 $\mu$ V/V + 25 mV					
(20 to 50) kHz	1 444 $\mu$ V/V + 25 mV					
(50 to 100) kHz	3 522 $\mu$ V/V + 25 mV					
(1 to 10) kV						
(50 to 60) Hz	0.12 kV	Hipotronics KVM-100				
(10 to 100) kV	1.2 kV					
Bandwidth > 2 MHz	(0 to 10) mV					
	(0.045 to 100) kHz	1 182 $\mu$ V/V + 6 $\mu$ V	Agilent 3458A OPT002			
	(0.1 to 1) MHz	14.2 mV/V + 5.1 $\mu$ V				
	(1 to 4) MHz	82.8 mV/V + 7.1 $\mu$ V				
	(4 to 8) MHz	236.4 mV/V + 8.1 $\mu$ V				
	(10 to 100) mV					
	(0.045 to 100) kHz	1 122 $\mu$ V/V + 60.5 $\mu$ V				
	(0.1 to 1) MHz	23.7 mV/V + 50.5 $\mu$ V				
	(1 to 4) MHz	47.3 mV/V + 70.5 $\mu$ V				
	(4 to 8) MHz	47.3 mV/V + 80.5 $\mu$ V				
(8 to 10) MHz	177 mV/V + 101 $\mu$ V					

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AC Voltage – Measure <sup>8</sup> Bandwidth > 2 MHz (cont.)	(0.1 to 1) V (0.045 to 100) kHz (0.1 to 1) MHz (1 to 4) MHz (4 to 8) MHz (8 to 10) MHz	1 122 mV/V + 605 μV 23.7 mV/V + 505 μV 47.3 mV/V + 705 μV 47.3 mV/V + 805 μV 177 mV/V + 1 005 μV	Agilent 3458A OPT002	OEM and GIDEP
	(1 to 10) V (0.045 to 100) kHz (0.1 to 1) MHz (1 to 4) MHz (4 to 8) MHz (8 to 10) MHz	1 142 mV/V + 6.1 μV 23.7 mV/V + 5.1 μV 47.3 mV/V + 7.1 μV 47.3 mV/V + 8.1 μV 177 mV/V + 10.1 μV		
	(10 to 100) V (0.045 to 100) kHz	1 477 μV/V + 2.5 mV		
	(100 to 1 000) V (0.045 to 100) kHz	3 607 μV/V + 105 mV		
AC Current – Source <sup>8</sup>	(0 to 220) μA (10 to 20) Hz (20 to 40) Hz (0.04 to 1) kHz (1 to 5) kHz (5 to 10) kHz	298.7 μA/A + 16 nA 200.2 μA/A + 10 nA 155.7 μA/A + 8 nA 331.0 μA/A + 12 nA 1 286 μA/A + 65 nA	Fluke 5720A	OEM and GIDEP
	(0.22 to 2.2) mA (10 to 20) Hz (20 to 40) Hz (0.04 to 1) kHz (1 to 5) kHz (5 to 10) kHz	312.6 μA/A + 40 nA 220.3 μA/A + 35 nA 152.6 μA/A + 35 nA 239.7 μA/A + 110 nA 1 273 μA/A + 650 nA		
	(2.2 to 22) mA (10 to 20) Hz (20 to 40) Hz (0.04 to 1) kHz (1 to 5) kHz (5 to 10) kHz	319.1 μA/A + 400 nA 229.4 μA/A + 350 nA 151.4 μA/A + 350 nA 238.9 μA/A + 550 nA 1 273 μA/A + 5 000 nA		
	(22 to 220) mA (10 to 20) Hz (20 to 40) Hz (0.04 to 1) kHz (1 to 5) kHz (5 to 10) kHz	298.8 μA/A + 4.0 μA 200.2 μA/A + 3.5 μA 153.1 μA/A + 2.5 μA 239.9 μA/A + 3.5 μA 1 273 μA/A + 10 μA		

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AC Current – Source <sup>8</sup> (cont.)	(0.22 to 2.2) A (20 to 1000) Hz (1 to 5) kHz (5 to 10) kHz	308.5 $\mu$ A/A + 35 $\mu$ A 524.5 $\mu$ A/A + 80 $\mu$ A 8 087 $\mu$ A/A + 160 $\mu$ A	Fluke 5720A	OEM and GIDEP
	(2 to 3) A (10 to 45) Hz (0.045 to 1) kHz (1 to 5) kHz (5 to 10) kHz	2 097 $\mu$ A/A + 100 $\mu$ A 746.1 $\mu$ A/A + 100 $\mu$ A 6.9 mA/A + 1 mA 28.9 mA/A + 5 mA	Fluke 5520A	
	(3 to 11) A (45 to 100) Hz (0.1 to 1) kHz (1 to 5) kHz	738.1 $\mu$ A/A + 2 mA 1 177 $\mu$ A/A + 2 mA 34.6 mA/A + 2 mA		
	(11 to 20.5) A (45 to 100) Hz (0.1 to 1) kHz (1 to 5) kHz	1 407 $\mu$ A/A + 5 mA 1 744 $\mu$ A/A + 5 mA 34.6 mA/A + 5 mA		
	(20.5 to 1 000) A (45 to 65) Hz	90 mA/A + 500 mA	Fluke 5520A w/ 50-turn coil	
AC Current – Measure <sup>8</sup>	(0 to 100) $\mu$ A (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz (0.1 to 5) kHz	4 750 $\mu$ A/A + 30 nA 1 890 $\mu$ A/A + 30 nA 827.1 $\mu$ A/A + 30 nA 827.1 $\mu$ A/A + 30 nA	Agilent 3458A OPT002	OEM and GIDEP
	(0.1 to 1) mA (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz (0.1 to 5) kHz (5 to 20) kHz (20 to 50) kHz (50 to 100) kHz	4 844 $\mu$ A/A + 200 nA 1 890 $\mu$ A/A + 200 nA 827.1 $\mu$ A/A + 200 nA 472.6 $\mu$ A/A + 200 nA 827.1 $\mu$ A/A + 200 nA 4 844 $\mu$ A/A + 400 nA 6 616 $\mu$ A/A + 1 500 nA		

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AC Current – Measure <sup>8</sup> (cont.)	(1 to 10 mA) (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz (0.1 to 5) kHz (5 to 20) kHz (20 to 50) kHz (50 to 100) kHz	4 844 $\mu$ A/A + 2 $\mu$ A 1 890 $\mu$ A/A + 2 $\mu$ A 827.1 $\mu$ A/A + 2 $\mu$ A 472.6 $\mu$ A/A + 2 $\mu$ A 827.1 $\mu$ A/A + 2 $\mu$ A 4 844 $\mu$ A/A + 4 $\mu$ A 6 616 $\mu$ A/A + 15 $\mu$ A	Agilent 3458A OPT002	OEM and GIDEP
	(10 to 100) mA (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz (0.1 to 5) kHz (5 to 20) kHz (20 to 50) kHz (50 to 100) kHz	4 844 $\mu$ A/A + 20 $\mu$ A 1 890 $\mu$ A/A + 20 $\mu$ A 827.1 $\mu$ A/A + 20 $\mu$ A 472.6 $\mu$ A/A + 20 $\mu$ A 472.6 $\mu$ A/A + 20 $\mu$ A 4 844 $\mu$ A/A + 40 $\mu$ A 6 616 $\mu$ A/A + 150 $\mu$ A		
	(0.1 to 1) A (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz (0.1 to 5) kHz (5 to 20) kHz (20 to 50) kHz	4.8 mA/A + 200 $\mu$ A 2.0 mA/A + 200 $\mu$ A 1.1 mA/A + 200 $\mu$ A 1.3 mA/A + 200 $\mu$ A 3.7 mA/A + 200 $\mu$ A 11.8 mA/A + 400 $\mu$ A		
	(1 to 10) A (20 to 50) Hz (0.05 to 2) kHz	231.1 mA/A + 10 mA 36.7 mA/A + 10 mA	Fluke 45	
Capacitance – Source <sup>8</sup>	(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 1.0 mF/F + 300 nF 6.0 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 13.0 mF/F + 100 $\mu$ F	Fluke 5520A	OEM and GIDEP

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Oscilloscopes <sup>8</sup>				
DC Voltage (50Ω)	1 mV to 6.6 V	2.9 mV/V + 40 μV	Fluke 5520A SC1100	OEM and GIDEP
DC Voltage (1MΩ)	1 mV to 130 V	544.4 μV/V +40 μV		
AC Voltage (50Ω)	1 mV to 6.6 V	2.9 mV/V + 40 μV		
AC Voltage (1MΩ)	1 mV to 130 V	1.1 mV/V + 40 μV		
Leveled Sinewave 50 kHz to 1.1 GHz	5 mV to 5.5 V	50.7 mV/V + 100 μV		
Time Markers	1 ns to 5 s	6.4 μs/s		
Wave Gen. (50Ω)	(0.0018 to 2.5) Vp-p	34.6 mV/V + 100 μV		
Wave Gen. (1MΩ)	(0.0018 to 55) Vp-p	34.6 mV/V + 100 μV		
Pulse Generator Width	(4 to 45) ns (45 to 500) ns	57.8 ms/s + 500 ps 57.8 ms/s + 4ns		
Pulse Generator Period	200 ns to 20 ms	57.8 ms/s + 200 ns		
Input Impedance Measure	(50 to 60) Ω (0.5 to 1) MΩ	1.2 mΩ/Ω 1.2 mΩ/Ω		
Thermocouple Simulation <sup>8</sup>				
Type K	(-200 to -100) °C (-100 to 120) °C (120 to 1 000) °C (1 000 to 1 372) °C	0.98 °C 0.93 °C 0.95 °C 1.02 °C	Fluke 5520A	OEM and GIDEP
Type J	(-210 to -100) °C (-100 to 760) °C (760 to 1 200) °C	0.50 °C 0.44 °C 0.47 °C		
Type E	(-250 to -100) °C (-100 to 650) °C (650 to 1 000) °C	0.67 °C 0.38 °C 0.41 °C		
Type T	(-250 to -150) °C (-150 to 0) °C (0 to 400) °C	0.83 °C 0.48 °C 0.43 °C		

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Thermocouple Simulation <sup>8</sup> (cont.) Type S	(0 to 250) °C (250 to 1 400) °C (1 400 to 1 767) °C	1.82 °C 1.79 °C 1.81 °C	Fluke 5520A	OEM and GIDEP
pH Meters <sup>8</sup>	(4.01, 7.00, 10.00) pH	0.020 pH	pH Buffer Solutions	OEM and GIDEP
Conductivity Meters <sup>8</sup>	12.85 mS/cm 1408 µS/cm	0.18 mS/cm 13.5 µS/cm	Conductivity Solutions	OEM and GIDEP
Refractometers <sup>8</sup>	(0.0, 18.0, 29.7) BRIX	0.24 BRIX	Refractive Index Solutions	OEM and GIDEP
Sound Level – Generate <sup>8</sup> 100 Hz, 250 Hz, 500 Hz, 1000 Hz, 2000 Hz	114 dB	0.6 dB	Gen Rad 1562-A	OEM and GIDEP
Accelerometers 1 g reference 1 g reference	20 Hz to 2 kHz 2 kHz to 15 kHz	1.7 % of reading 2.6 % of reading	PCB 9150C	OEM and GIDEP

## II. Electromagnetic – RF / Microwave

PARAMETER/ EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
RF Power – Measure <sup>3,8</sup> (+20 to +30) dBm  (-20 to +20) dBm	100 kHz to 3 GHz 3 GHz to 18 GHz 18 GHz to 26.5 GHz  100 kHz to 3 GHz 3 GHz to 18 GHz 18 GHz to 26.5 GHz	0.369 dB 0.384 dB 0.395 dB  0.145 dB 0.182 dB 0.205 dB	Agilent N5531S measuring receiver with N5532A sensor modules	OEM and GIDEP

PARAMETER/ EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
RF Power – Source <sup>8</sup>				
> -10 dBm	250 kHz to 2 GHz 2 GHz to 20 GHz 20 GHz to 40 GHz	0.72 dB 0.96 dB 1.08 dB	Agilent E8257D	OEM and GIDEP
(-10 to -70) dBm	250 kHz to 2 GHz 2 GHz to 20 GHz 20 GHz to 40 GHz	0.89 dB 1.07 dB 1.19 dB		
(-70 to -90) dBm	250 kHz to 2 GHz 2 GHz to 20 GHz 20 GHz to 40 GHz	0.95 dB 1.20 dB 1.21 dB		
Tuned RF Level – Measure <sup>3,8</sup>				
Absolute Level				
(+16 to +30) dBm (-106 to +16) dBm (-129 to -106) dBm	500 kHz to 3.05 GHz	0.369 dB + 0.005 dB/10 dB 0.145 dB + 0.005 dB/10 dB 0.151 dB + 0.120 dB/10 dB	Agilent N5531S measuring receiver with N5532A sensor modules	OEM and GIDEP
(+20 to +30) dBm (-90 to +20) dBm (-114 to -90) dBm	3.05 GHz to 6.6 GHz	0.384 dB + 0.005 dB/10 dB 0.182 dB + 0.005 dB/10 dB 0.233 dB + 0.120 dB/10 dB		
(+20 to +30) dBm (-81 to +20) dBm (-104 to -81) dBm	6.6 GHz to 13.2 GHz	0.384 dB + 0.005 dB/10 dB 0.182 dB + 0.005 dB/10 dB 0.233 dB + 0.120 dB/10 dB		
(+20 to +30) dBm (-70 to +20) dBm (-93 to -70) dBm	13.2 GHz to 19.2 GHz	0.395 dB + 0.005 dB/10 dB 0.205 dB + 0.005 dB/10 dB 0.245 dB + 0.120 dB/10 dB		
(+20 to +30) dBm (-62 to +20) dBm (-85 to -62) dBm	19.2 GHz to 26.5 GHz	0.395 dB + 0.005 dB/10 dB 0.205 dB + 0.005 dB/10 dB 0.239 dB + 0.120 dB/10 dB		
Relative Level				
(-90 to +30) dBm (-106 to -90) dBm (-129 to -106) dBm	500 kHz to 3.05 GHz	0.026 dB + 0.005 dB/10 dB 0.067 dB + 0.120 dB/10 dB 0.076 dB + 0.120 dB/10 dB		

PARAMETER/ EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Relative Level  (-90 to +30) dBm (-113 to -90) dBm  (-81 to +30) dBm (-104 to -81) dBm  (-70 to +30) dBm (-93 to -70) dBm  (-62 to +30) dBm (-85 to -62) dBm	3.05 GHz to 6.6 GHz  6.6 GHz to 13.2 GHz  13.2 GHz to 19.2 GHz  19.2 GHz to 26.5 GHz	0.026 dB + 0.005 dB/10 dB 0.067 dB + 0.120 dB/10 dB  0.026 dB + 0.005 dB/10 dB 0.062 dB + 0.120 dB/10 dB  0.026 dB + 0.005 dB/10 dB 0.056 dB + 0.120 dB/10 dB  0.026 dB + 0.005 dB/10 dB 0.051 dB + 0.120 dB/10 dB	Agilent N5531S measuring receiver with N5532A sensor modules	OEM and GIDEP
RF Power Sensors- Calibration Factor <sup>3,8</sup>  (-20 to +14) dBm	100 kHz to 10 MHz 10 MHz to 10 GHz 10 GHz to 18 GHz	1.5 % 1.5 % 1.7 %	Tegam 1827, Agilent 3458A, Agilent E8257D, Agilent E4419B, Agilent 3325B	OEM and GIDEP
Frequency Modulation – Measure <sup>8</sup>  Rate: 20 Hz to 10 kHz Dev.: ≤ 40 kHz peak  Rate: 20 Hz to 200 kHz Dev.: ≤ 400 kHz peak  Rate: 20 Hz to 200 kHz Dev.: ≤ 400 kHz peak	250 kHz to 10 MHz  10 MHz to 3 GHz  3 GHz to 26.5 GHz	3.1 % of reading  3.1 % of reading  7.7 % of reading	Agilent N5531S measuring receiver with N5532A sensor modules	OEM and GIDEP
Frequency Modulation – Source <sup>8</sup>  1 dB Rate: DC to 100 kHz 3 dB Rate: DC to 10 MHz Dev.: ≤ (N X 800 kHz)	250 kHz to 40 GHz	4.2 % setting + 20 Hz	Agilent E8257D	OEM and GIDEP
Amplitude Modulation – Measure <sup>8</sup>  Rate: 50 Hz to 10 kHz Depths: 5% to 99%  Rate: 50 Hz to 100 kHz Depths: 20% to 99%	100 kHz to 10 MHz  10 MHz to 3 GHz	2.2 % of reading  1.2 % of reading	Agilent N5531S measuring receiver with N5532A sensor modules	OEM and GIDEP

PARAMETER/ EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Amplitude Modulation – Measure <sup>8</sup> (cont.)				
Rate: 50 Hz to 100 kHz Depths: 5% to 20%	10 MHz to 3 GHz	4.2 % of reading	Agilent N5531S measuring receiver with N5532A sensor modules	OEM and GIDEP
Rate: 50 Hz to 100 kHz Depths: 20% to 99%	3 GHz to 26.5 GHz	3.5 % of reading		
Rate: 50 Hz to 100 kHz Depths: 5% to 20%	3 GHz to 26.5 GHz	6.0 % of reading		
Amplitude Modulation – Source <sup>8</sup>				
Rate: DC to 100 kHz Depths: 0% to 100%	250 kHz to 40 GHz	7.1 % setting + 1%	Agilent E8257D	OEM and GIDEP
Phase Modulation – Measure <sup>8</sup>				
Rate: 200 Hz 20 kHz Dev.: > 0.7 rad	100 kHz to 6.6 GHz	1.2 % of reading	Agilent N5531S measuring receiver with N5532A sensor modules	OEM and GIDEP
Rate: 200 Hz 20 kHz Dev.: > 0.3 rad	100 kHz to 6.6 GHz	3.6 % of reading		
Rate: 200 Hz 20 kHz Dev.: > 2.0 rad	6.6 GHz to 13.2 GHz	1.2 % of reading		
Rate: 200 Hz 20 kHz Dev.: > 0.6 rad	6.6 GHz to 13.2 GHz	3.6 % of reading		
Rate: 200 Hz 20 kHz Dev.: > 2.0 rad	13.2 GHz to 26.5 GHz	1.2 % of reading		
Rate: 200 Hz 20 kHz Dev.: > 0.6 rad	13.2 GHz to 26.5 GHz	3.6 % of reading		
Phase Modulation – Source <sup>8</sup>				
Rate: DC to 100 kHz	250 kHz to 40 GHz	5.9 % setting + 0.1 rad	Agilent E8257D	OEM and GIDEP
Pulse Generation – Measure <sup>8</sup>				
DC to 225 MHz			Agilent 53132A	OEM and GIDEP
Pulse Width Rise/Fall Time	5 ns to 10 <sup>5</sup> s 5 ns to 10 <sup>5</sup> s	1.1 ns 1.1 ns		

PARAMETER/ EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Pulse Generation – Source <sup>8</sup>  Repetition Frequency: 0.024 Hz to 14.28 MHz Period: 70 ns to 42 s	10 ns to 42 s	17.3 ns	Agilent E8257D	OEM and GIDEP
Pulse Modulation – Source  Level  Rise/Fall Time	(0 to 9) dBm  (0.010 to 40) GHz	0.59 dBm  11.5 ns	Agilent E8257D  Agilent E8257D	OEM and GIDEP

### III. Time and Frequency

PARAMETER/ EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Time Interval <sup>8</sup>	(1 to 86 400) s	0.00045 s	Agilent 53132A & Spectracom 8197B	OEM and GIDEP

### IV. Thermodynamic

PARAMETER/ EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Temperature – Source <sup>8</sup>  Immersion Probes  Infrared  Surface Probes	(-30 to 600) °C  (122 to 932) °F  (35 to 400) °C	0.03 °C  0.9 °F  1.24 °C	Hart Scientific 9011 with PRT  Hart Scientific 9132  Hart Scientific 2200	OEM and GIDEP
Temperature – Measure <sup>8</sup>	(-30 to 600) °C	0.03 °C	Hart Scientific 1502 with PRT	OEM and GIDEP
Thermohygrometers  Temperature  Humidity	(0 to 70) °C  (10 to 98) %RH	0.2 °C  0.9 %RH	Thunder Scientific 2500	OEM and GIDEP

## V. Dimensional

PARAMETER/ EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Gage Blocks	Up to 8 in (8 to 20) in	(4.6 + 1.6L) $\mu$ in (13.4 + 0.9L) $\mu$ in	P&W Labmaster OKM OPAL 600	ASME B89.1.9
Length Standards	Up to 9 in (9 to 24) in	(39 + 0.4L) $\mu$ in (16 + 0.9L) $\mu$ in	P&W Supermicrometer OKM OPAL 600	OEM and GIDEP
Cylindrical Rings	(0.025 to 12) in	(33.9 + 1.7D) $\mu$ in	OKM OPAL 600	ASME B89.1.6
Cylindrical Plugs <sup>4</sup>	(0.01 to 8) in	(21.7 + 0.3D) $\mu$ in	OKM OPAL 600	OEM and GIDEP
Thread Rings  Pitch Diameter Minor Diameter	(0.01 to 8) in (0.03 to 3) in	(236 + 0.3 D) $\mu$ in 422 $\mu$ in	Setting Plug Gages ID Bore Gages	ASME B1.2
NPT Rings  Standoff and Basic Length	(0.0625 to 6) in	244 $\mu$ in	NPT plugs and P&W Labmaster	ASME B1.20.5
NPT Plugs  Standoff and Basic Length	(0.0625 to 6) in	488 $\mu$ in	NPT rings and P&W Labmaster	ASME B1.20.5
Threaded Plugs <sup>4</sup>  Pitch Diameter Major Diameter	(0.01 to 10) in (0.01 to 10) in	(73 + 0.9D) $\mu$ in (40 + 1.2D) $\mu$ in	P&W Supermicrometer and Thread Measuring Wires	ASME B1.2
Thread Wires	(0.005 to 0.05) in	(19.8 + 0.7D) $\mu$ in	OKM OPAL 600	ASME B89.1.17
Calipers <sup>8</sup>	Up to 40 in	(382 + 15L) $\mu$ in	Gage Blocks	OEM and GIDEP
Dial Indicators <sup>8</sup>	Up to 4 in	(36 + 10L) $\mu$ in	Indicator Checker	OEM and GIDEP
Test Indicator <sup>8</sup>	Up to 0.06 in	232 $\mu$ in	Indicator Checker	OEM and GIDEP
OD Micrometer <sup>8</sup>	Up to 24 in	(62 + 20L) $\mu$ in	Gage Blocks	OEM and GIDEP

<b>PARAMETER/ EQUIPMENT</b>	<b>RANGE</b>	<b>BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]</b>	<b>REFERENCE STANDARD OR EQUIPMENT</b>	<b>METHOD(S)</b>
ID Micrometer <sup>8</sup>	(1.5 to 24) in	(64 + 6L) μin	Gage Blocks	OEM and GIDEP
Height Gages <sup>8</sup>	Up to 40 in	(375 + 11L) μin	Gage Blocks	OEM and GIDEP
Crimpers <sup>8</sup> Die Check Crimp Height	(0.011 to 0.5) in (0.01 to 0.5) in	233 μin 0.0012 in	Pin Gages Micrometer	OEM and GIDEP
Profilometer <sup>8</sup> Ra	(2 to 300) μin	2.2 μin	Roughness Specimen	OEM and GIDEP
Surface Plates <sup>8</sup> Repeatability Flatness	4 in to 34 in (Diagonal) 34 in to 175 in (Diagonal)	(30 + 0.2D) μin (66 + 0.2D) μin	Repeat – O – Meter Electronic Levels	OEM and GIDEP
CMM Calibration <sup>8</sup> Volumetric Linearity Linearity	(5 to 40) in (1 to 60) in Above 60 in	(12 + 14L) μin (7 + 14L) μin (20 + 0.4L) μin	Ball Bars Step Gage Renishaw Laser System	B89.4.1
Optical Comparator <sup>8</sup> Linearity Magnification	Up to 12 in 10x, 20x, 31.25x, 50x, 62.5x, 100x, 200x	(97 + 12L) μin 0.000463 in	Glass Scale / Precision Balls Calibration sphere	OEM and GIDEP
Roundness Testers <sup>8</sup> Axial Error Radial Error	All	0.153 μm 0.153 μm	Test Sphere	OEM and GIDEP
ULM <sup>8</sup> Length	(1 to 100) mm	0.19 μm	Gage Blocks	OEM and GIDEP
Film Thickness Gage <sup>8</sup>	(0.01 to 0.06) in	382 μin	Film Thickness Standards	OEM and GIDEP

PARAMETER/ EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Brinell Scope <sup>8</sup>	(1 to 6) mm	11 $\mu$ m	Stage Micrometer	OEM and GIDEP

#### VI. Dimensional Inspection / Measurement

PARAMETER/ EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Dimensional Inspection				
Volumetric	28 in x 40 in x 24 in	323 $\mu$ m	CMM	Customer Drawings
Linear	24 in x 18 in x 6 in	(332 + 38L) $\mu$ m	Video Measuring Machine	
Profilometer Reference Specimens				
Ra	(0.01 to 300) $\mu$ m	2.1 $\mu$ m	Profilometer	Customer Drawings

#### VII. Mechanical

PARAMETER/ EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Mass	10 lb 5000 g 3000 g 2000 g 1000 g 500 g 300 g 200 g 100 g 50 g 30 g 20 g 10 g 5 g 3 g 2 g 1 g	135 mg 46.0 mg 30.3 mg 23.2 mg 17.7 mg 16.1 mg 15.7 mg 1.74 mg 0.89 mg 0.47 mg 0.32 mg 0.25 mg 0.194 mg 0.182 mg 0.175 mg 0.174 mg 0.173 mg	Class 1 weights and analytical balance	Modified Substitution

PARAMETER/ EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Bench and Floor Scales <sup>8</sup>	(0.5 to 5 000) lb	1 lb	NIST 105 Class F weights	NIST Handbook 44
Analytical Balances <sup>8</sup>	1 mg to 13 kg	0.28 mg	ASTM E617 Class 1 weights	NIST Handbook 44
Pressure <sup>8</sup>	(-13 to 300) psi (300 to 1 000) psi	0.10 psi 1.3 psi	Pressure Calibrator	OEM and GIDEP
	(1 000 to 10 000) psi (10 000 to 30 000) psi	3.9 psi 35.2 psi	Pressure Transducers	
Force <sup>8</sup>	Up to 200 lb (200 to 2 000) lb (2 000 to 10 000) lb	0.045 % reading 0.045 % reading 0.038% reading	Dead Weight Load Cell Load Cell	OEM and GIDEP
Torque – Generate <sup>8</sup>	Up to 250 lbf-ft (250 to 2 000) lbf-ft	0.05 % range 0.06 % range	Torque Arms & Dead Weight	OEM and GIDEP
Torque - Measure <sup>8</sup>	4 lbf-in to 2000 lbf-ft	0.3 % reading	CDI Torque System	OEM and GIDEP
Hardness Testers <sup>8</sup>  Rockwell	HRA Low	1.22 HRA	Rockwell Test Blocks	Indirect comparison per ASTM E18
	HRA Med	1.24 HRA		
	HRA High	0.75 HRA		
	HRB Low	1.39 HRB		
	HRB Med	1.39 HRB		
	HRB High	1.33 HRB		
	HRC Low	1.22 HRC		
	HRC Med	1.22 HRC		
	HRC High	0.70 HRC		
	HRE Low	1.28 HRE		
	HRE Med	1.42 HRE		
	HRE High	1.34 HRE		
HRF Low	1.43 HRF			
HRF Med	1.43 HRF			
HRF High	1.42 HRF			
HRH Low	1.35 HRH			
HRH Med	1.35 HRH			
HRH High	1.35 HRH			

PARAMETER/ EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Hardness Testers <sup>8</sup>  Rockwell (cont.)	HR15N Low HR15N Med HR15N High  HR30N Low HR30N Med HR30N High  HR45N Low HR45N Med HR45N High  HR15T Low HR15T Med HR15T High  HR30T Low HR30T Med HR30T High  HR45T Low HR45T Med HR45T High	1.51 HR15N 1.24 HR15N 0.90 HR15N  1.31 HR30N 1.25 HR30N 0.93 HR30N  1.34 HR45N 1.26 HR45N 0.95 HR45N  1.95 HR15T 1.40 HR15T 1.47 HR15T  1.99 HR30T 1.51 HR30T 1.33 HR30T  1.95 HR45T 1.33 HR45T 1.42 HR45T	Rockwell Test Blocks	Indirect comparison per ASTM E18
Brinell	(1 to 7) mm	0.026 mm	Brinell Test Blocks & Brinell Scope	Indirect comparison per ASTM E10
Knoop	(1 to 200) μm	0.25 μm	Knoop & Vickers Test Blocks	Indirect comparison per ASTM E384
Vickers	(1 to 200) μm	0.17 μm		
Durometers <sup>8</sup>  Spring Force Indentor Angle	(0.1 to 45.0) N (20 to 40) °	0.044 N 0.07 °	Triple Beam Balance Video Measuring Machine	Per ASTM D2240
Indentor Length Indentor Radius	(0.049 to 0.198) in (0.05 to 0.1) in	333 μin 337 μin	Gage Blocks Gage Blocks	

PARAMETER/ EQUIPMENT	RANGE	BEST MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(+)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Tachometers <sup>8</sup>  Contact Non-Contact	(1 to 6 500) RPM (500 to 40 000) RPM	0.08 % of reading	King Nutronics 3711-B	OEM and GIDEP

**Notes:**

1. Best Measurement Uncertainties (Expanded Uncertainty) are based on approximately a 95% confidence interval, using a coverage of  $k=2$
2. The uncertainty associated when calibrating a balance/scale is dependent on local conditions, such as the resolution of the unit being calibrated and the environment in which the balance/scale is operating. The uncertainty listed in the scope here represents the best uncertainty for a balance/scale which the organization typically calibrates in its lab. Since field (on-site) conditions are typically more variable than those in the laboratory, larger measurement uncertainties are expected in the field (on-site) than what is reported on the accredited scope.
3. Uncertainties do not include inaccuracies due to sensor mismatch.
4. On site capability for this parameter using plug gage comparator only. Gages up to 4 inches.
5. For uncertainties expressed as  $b + mL$ ,  $L$  = Length in inches.
6. For uncertainties expressed as  $b + mD$ ,  $D$  = Diameter or Diagonal in inches.
7. Where ranges overlap, the uncertainty for the overlapping specifications will be the lower of the two uncertainties.
8. On site capability offered for this parameter. Since field (on-site) conditions are typically more variable than those in the laboratory, larger measurement uncertainties are expected in the field (on-site) than what is reported on the accredited scope.
9. This scope is part of and must be included with the Certificate of Accreditation No. AC-1272




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President/CEO