



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

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CALIBRATION

Valid to: February 13, 2014

Certificate Number: AC - 1376

I. Electromagnetic – DC/LF

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
DC Voltage - Source	0 to 330 mV 330 mV to 3.3 V (3.3 to 33) V (33 to 330) V (330 to 1 020) V	5 μV/V + 1 μV 4 μV/V + 3 μV 4 μV/V + 30 μV 4.5 μV/V + 300 μV 4.5 μV/V + 900 μV	Fluke 5500A	CMSCP-032, GIDEP or OEM
DC Current - Source	0 to 3.3 mA (3.3 to 33) mA (33 to 330) mA 330 mA to 2.2 A (2.2 to 11) A	130 μA/A + 50 nA 100 μA/A + 250 nA 100 μA/A + 3.3 μA 300 μA/A + 44 μA 600 μA/A + 330 μA		
AC Voltage - Source	<b>(1 to 33) mV</b> (10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz <b>(33 to 330) mV</b> (10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz <b>330 mV to 3.3 V</b> (10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	3.5 mA/A + 20 μV 1.5 mA/A + 20 μV 2 mA/A + 20 μV 2.5 mA/A + 20 μV 3.5 mA/A + 33 μV 10 mA/A + 60 μV  2.5 mV/V + 50 μV 500 μV/V + 20 μV 1 mV/V + 20 μV 1.6 mV/V + 40 μV 2.4 mV/V + 170 μV 7 mV/V + 330 μV  1.5 mV/V + 250 μV 300 μV/V + 60 μV 800 μV/V + 60 μV 1.4 mV/V + 300 μV 2.4 mV/V + 1.7 mV 5 mV/V + 3.3 mV		



PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
AC Voltage – Source (cont.)	<b>(3.3 to 33) V</b> (10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz <b>(33 to 330) V</b> 45 Hz to 1 kHz (1 to 10) kHz (10 to 20) kHz <b>(330 to 1 020) V</b> 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	1.5 mV/V + 2.5 mV 400 µV/V + 600 µV 800 µV/V + 2.6 mV 1.9 mV/V + 5 mV 2.4 mV/V + 17 mV  500 µV/V + 6.6 mV 800 µV/V + 15 mV 900 µV/V + 33 mV  500 µV/V + 80 mV 2 mV/V + 100 mV 2 mV/V + 500 mV		
AC Current - Source	<b>(30 to 330) µA</b> (10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz <b>330 µA to 3.3 mA</b> (10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz <b>(3.3 to 33) mA</b> (10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz <b>(33 to 330) mA</b> (10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz <b>330 mA to 2.2 A</b> (10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz <b>(2.2 to 11) A</b> (45 to 65) Hz (65 to 500) Hz 500 Hz to 1 kHz	2.5 mA/A + 150 nA 1.3 mA/A + 150 nA 1.3 mA/A + 250 nA 4 mA/A + 150 nA 12.5 mA/A + 150 nA  2 mA/A + 300 nA 1 mA/A + 300 nA 1 mA/A + 300 nA 2 mA/A + 300 nA 6 mA/A + 300 nA  2 mA/A + 3 µA 1 mA/A + 3 µA 900 µA/A + 3 µA 2 mA/A + 3 µA 6 mA/A + 3 µA  2 mA/A + 20 µA 1 mA/A + 20 µA 900 µA/A + 20 µA 2 mA/A + 50 µA 6 mA/A + 100 µA  2 mA/A + 300 µA 1 mA/A + 300 µA 7.5 mA/A + 300 µA  600 µA/A + 2 mA 1 mA/A + 2 mA 3.3 mA/A + 2 mA	Fluke 5500A	CMSCP-032, GIDEP or OEM



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DC Power – Source 33 mV to 1 020 V	(3.3 to 9) mA (9 to 33) mA (33 to 90) mA (90 to 330) mA (330 to 900) mA 900 mA to 2.2 A (2.2 to 4.5) A (4.5 to 11) A	0.04 % of Watts output 0.03 % of Watts output 0.04 % of Watts output 0.03 % of Watts output 0.08 % of Watts output 0.06 % of Watts output 0.12 % of Watts output 0.09 % of Watts output	Fluke 5500A	CMSCP-032, GIDEP or OEM
AC Power – Source (45 to 65) Hz	<b>(3.3 to 9) mA</b> (33 to 330) mV 330 mV to 1 020 V	0.4 % of Watts output 0.25 % of Watts output		
	<b>(9 to 33) mA</b> (33 to 330) mV 330 mV to 1 020 V	0.25 % of Watts output 0.15 % of Watts output		
	<b>(33 to 90) mA</b> (33 to 330) mV 330 mV to 1 020 V	0.35 % of Watts output 0.25 % of Watts output		
	<b>(90 to 330) mA</b> (33 to 330) mV 330 mV to 1 020 V	0.25 % of Watts output 0.15 % of Watts output		
	<b>(330 to 900) mA</b> (33 to 330) mV 330 mV to 1 020 V	0.35 % of Watts output 0.25 % of Watts output		
	<b>900 mA to 1.5 A</b> (33 to 330) mV 330 mV to 1 020 V	0.25 % of Watts output 0.15 % of Watts output		
Resistance - Source	<b>(1.5 to 4.5) A</b> (33 to 330) mV 330 mV to 1 020 V	0.35 % of Watts output 0.2 % of Watts output		
	<b>(4.5 to 11) A</b> (33 to 330) mV 330 mV to 1 020 V	0.25 % of Watts output 0.15 % of Watts output		
	0 to 11 Ω (11 to 33) Ω (33 to 330) Ω	120 μΩ/Ω + 8 mΩ 120 μΩ/Ω + 15 mΩ 90 μΩ/Ω + 15 mΩ		
	330 Ω to 3.3 kΩ (3.3 to 33) kΩ (33 to 110) kΩ	90 μΩ/Ω + 60 mΩ 90 μΩ/Ω + 600 mΩ 110 μΩ/Ω + 6 Ω		
	(110 to 330) kΩ 330 kΩ to 3.3 MΩ (3.3 to 11) MΩ	120 μΩ/Ω + 6 Ω 150 μΩ/Ω + 55 Ω 600 μΩ/Ω + 550 Ω		
	(11 to 33) MΩ (33 to 110) MΩ (110 to 330) MΩ	1 mΩ/Ω + 550 Ω 5 mΩ/Ω + 5.5 kΩ 5 mΩ/Ω + 16.5 kΩ		



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Capacitance – Source 50 Hz to 1 kHz 50 Hz to 1 kHz 50 Hz to 1 kHz 50 Hz to 1 kHz 50 Hz to 1 kHz (50 to 400) Hz (50 to 400) Hz (50 to 200) Hz (50 to 100) Hz (50 to 100) Hz	330 pF to 11 nF (11 to 110) nF (110 to 330) nF 330 nF to 1.1 µF (1.1 to 3.3) µF (3.3 to 11) µF (11 to 33) µF (33 to 110) µF (110 to 330) µF 330 µF to 1.1 mF	5 mF/F + 10 pF 2.5 mF/F + 100 pF 2.5 mF/F + 300 pF 2.5 mF/F + 1 nF 3.5 mF/F + 3 nF 3.5 mF/F + 10 nF 4 mF/F + 30 nF 5 mF/F + 100 nF 7 mF/F + 300 nF 10 mF/F + 300 nF	Fluke 5500A	CMSCP-032, GIDEP or OEM
Electrical Simulation of Thermocouple Indicators * Type B Type C Type E Type J Type K Type L	(600 to 800) °C (800 to 1 000) °C (1 000 to 1 550) °C (1 550 to 1 820) °C  (0 to 150) °C 9150 TO 650) °C (650 TO 1 000) °C (1 000 TO 1 800) °C (1 800 TO 2 316) °C  (-250 to -100) °C (-100 to -25) °C (-25 to 350) °C (350 to 650) °C (650 to 1 000) °C  (-210 to -100) °C (-100 to -30) °C (-30 to 150) °C (150 to 760) °C (760 to 1 200) °C  (-200 to -100) °C (-100 to -25) °C (-25 to 120) °C (120 to 1 000) °C (1 000 to 1 372) °C  (-200 to -100) °C (-100 to 800) °C (800 to 900) °C	0.44 °C 0.34 °C 0.3 °C 0.33 °C  0.3 °C 0.26 °C 0.31 °C 0.5 °C 0.84 °C  0.5 °C 0.16 °C 0.14 °C 0.16 °C 0.21 °C  0.27 °C 0.16 °C 0.14 °C 0.17 °C 0.23 °C  0.33 °C 0.18 °C 0.16 °C 0.26 °C 0.4 °C  0.37 °C 0.26 °C 0.17 °C	Fluke 5500A	CMSCP-033, GIDEP or OEM



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Electrical Simulation of Thermocouple Indicators * (cont.)				
Type N	(-200 to -100) °C (-100 to -25) °C (-25 to 120) °C (120 to 410) °C (410 to 1 300) °C	0.4 °C 0.22 °C 0.19 °C 0.18 °C 0.27 °C		
Type R	(0 to 250) °C (250 to 400) °C (400 to 1 000) °C (1 000 to 1 767) °C	0.57 °C 0.36 °C 0.34 °C 0.40 °C		
Type S	(0 to 250) °C (250 to 1 000) °C (1 000 to 1 400) °C (1 400 to 1 767) °C	0.47 °C 0.36 °C 0.37 °C 0.46 °C		
Type T	(-250 to -150) °C (-150 to 0) °C (0 to 120) °C (120 to 400) °C	0.63 °C 0.25 °C 0.17 °C 0.15 °C	Fluke 5500A	CMSCP-033, GIDEP or OEM
Type U	(0 to 600) °C	0.27 °C		
Electrical Simulation of RTDs				
Pt 395, 100 Ω	(-200 to -80) °C (-80 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 0.05 °C 0.07 °C 0.09 °C 0.1 °C 0.12 °C 0.23 °C		
Pt 3926, 100 Ω	(-200 to -80) °C (-80 to 0) °C (0 to 100) °C (100 to 300) °C (300 to 400) °C (400 to 630) °C	0.05 °C 0.05 °C 0.07 °C 0.09 °C 0.1 °C 0.12 °C		



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Electrical Simulation of RTDs (cont.)				
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 -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	0.04 °C 0.04 °C 0.04 °C 0.05 °C 0.12 °C 0.13 °C 0.14 °C 0.16 °C		
Pt 385, 500 Ω	(-200 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	0.04 °C 0.05 °C 0.05 °C 0.06 °C 0.08 °C 0.08 °C 0.09 °C 0.11 °C	Fluke 5500A	CMSCP-033, GIDEP or OEM
Pt 385, 1 kΩ	(-200 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	0.03 °C 0.03 °C 0.04 °C 0.05 °C 0.06 °C 0.07 °C 0.07 °C 0.23 °C		
PtNi 385, 120 Ω	(-80 to 0) °C (0 to 100) °C (100 to 260) °C	0.08 °C 0.08 °C 0.14 °C		
Cu 427, 10 Ω	(-100 to 260) °C	0.3 °C		



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Oscilloscopes				
Amplitude – DC 50 Ω 1 MΩ	(0 to 2.2) V (0 to 33) V	0.25 % + 100 μV 0.25 % + 100 μV		
Amplitude – Square Wave 50 Ω 1 MΩ	1.8 mV to 2.2 V p-p 1.8 mV to 105 V p-p	0.25 % + 100 μV 0.25 % + 100 μV		
Leveled Sine Wave (ref 50 kHz)	50 kHz reference	2 % + 200 μV	Fluke 5500A - SC300	
Amplitude	50 kHz to 100 MHz (100 to 300) MHz	3.5 % + 300 μV 4 % + 300 μV		
Flatness	50 kHz to 100 MHz (100 to 300) MHz	1.5 % + 100 μV 2 % + 100 μV		CMSCP-032, GIDEP or OEM
Time Marker	5 s to 100 μs 50 ms to 2 μs 1 μs to 2 ns	(25 + 1 000t) μs/s (25 + 15 000t) μs/s 25 μs/s		
Rise Time	≤ 300 ps	+0/-100 ps		
Flatness	100 kHz to 1.04 GHz	0.05 dB	HP 8657A	
Phase - Source	(10 to 65) Hz (65 to 500) Hz 500 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.4 ° 1.5 ° 5 ° 6 ° 10 °	Fluke 5500A - SC300	
Frequency - Source	0.01 Hz to 1.2 kHz (1.2 to 10) kHz 10 kHz to 2 MHz	25 μHz/Hz + 1 mHz 25 μHz/Hz + 1 mHz 25 μHz/Hz + 15 mHz	Fluke 5500A - SC300	
Insulation Tester DC and AC	Up to 40 kV and 1 000A	1.12 % of reading	Fluke 45 with HV Probe and Decade Resistors	CMSCP-065, GIDEP or OEM
Power Supplies, Hypot Testers, Welders DC and AC *	Up to 40 kV and 1 000A	1 % of reading	Fluke 45 or HP 34401 With Shunts and Decade Resistors	CMSCP-040, GIDEP or OEM
Conductivity	All	1 % of reading	Conductivity Standards	CMSCP-060, GIDEP or OEM

## II. Time & Frequency

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Stopwatches & Timers * Analog and Digital	Stopwatches Timers	0.002 % of reading 0.006 % of reading	Quartz Standard Stop Watch	CMSCP-049 GIDEP or OEM
Tachometers  Photo Type Mechanical Type	Up to 100 000 RPM	0.51 % of reading 1.17 % of reading	HP200CD Wide Range Oscillator, Fluke 45, Digital Photo Tachometer	CMSCP-038 GIDEP or OEM

## III. Thermodynamic

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Ovens Environmental Chambers Freezers *	(0 to 2 501) °F (5 to 95) %RH	2.89 °F 2 % RH	Data Logger Thermocouple Calibrator Digital Psychrometer	CMSCP-013 AMS 2750D GIDEP or OEM
Temperature Controllers Thermometers IR Thermometers	32°F / 0°C and Ambient to 1000°F / 538°C	1.31°F / .73°C	Lab Oven Thermocouple Calibrator Omega Ice point (Dry Block)	CMSCP-033 GIDEP or OEM
Thermocouples	32°F / 0°C and Ambient to 1000°F / 538°C	1.31°F / .73°C	Thermocouple Calibrator Omega Ice point (Dry Block)	CMSCP-033 GIDEP or OEM
Hygrometers Hygrothermographs	(5 to 95) %RH	1 % of reading	Environmental Chamber and Salt Solutions	CMSCP-033.1 NBS Technical Note Vol 81A No. 1 GIDEP or OEM

#### IV. Mechanical

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Rockwell Hardness Testers *	Standard Superficial and All Scale	1 point	Hardness Standards A,B,C,E,N,T and Digital Load Checker	CMSCP-004 ASTM E-18
Micro Hardness Testers *	Vickers and Knoop	2 µm	Vickers and Knoop Hardness Standards Glass Scale	CMSCP-004 ASTM E-384
Brinell Hardness Testers *	Brinell	0.05 mm	Hardness Standards Brinell Load Cell Measure Scope	CMSCP-004 ASTM E-10
Durometer and Shore Hardness Tester *	Types A, D, M	0.725 point	Gage Blocks Digital Force Gage Fixture	CMSCP-043 ASTM D2240

#### V. Dimensional

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Force Gages * Load Cells	Up to 100 g 100 to 500 g 500 g to 5 kg (5 to 25) kg	2.9 mg 2.9 mg 16.4 mg 240 mg	Class F Weights Load Cells	CMSCP-015 NIST Handbook 44 GIDEP or OEM
	Up to 500 lb (500 to 10 000) lb	1.7 g 0.20 % of reading		
Scales and Balances *	Up to 100 g 100 to 500 g 500 g to 5 kg (5 to 25) kg	2.9 mg 2.9 mg 16.4 mg 240 mg	Class F Weights OIML M1	
	Up to 500 lb	1.7 g		
Surface Roughness Gages *	(10 to 120) µin	5.86 µin	Calibrated Specimens	CMSCP-021 GIDEP or OEM
Specimens	(10 to 120) µin	3.13 µin	Hommel Surface Tester	



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Mass	Up to 100 g >100 to 1000 g / 1-2 lb >1 kg to 2 kg >2 kg to 5 kg / 5-10 lb >5 kg to 10 kg / 20 lb >10 kg to 20 kg / - 50lb	1.285 mg 2.6 mg 3.6 mg 16.7 mg 116 mg 125 mg	Class F Weights OIML M1	CMSCP-056 NIST Handbook 105-1 OIML or OEM	
Torque Tools *	0.1 in-oz to 1 200 ft-lb	1% of reading	Waters Torque Watch Calibrator Digital Torque Calibrator Load Cells	CMSCP-025 ASME B107.14M GGG-W-686e GIDEP or OEM	
Torque Calibrators Torque Ratio Arms & Wheels	0.1 in-oz to 1 200 ft-lb  1-60 in	0.5% of reading  (9.6+15.5L) µin	Torque Arms Class F Weights Surface Plate, Gage Blocks, Amp & Probe	CMSCP-025 ASME B107.14M GGG-W-686e GIDEP or OEM	
Pressure and Vacuum Gages *	Up to 20 psi Up to 10 000 psi Up to 10 000 psi Up to 25 in Hg	0.03 % of reading 0.054 % of reading 0.11 % of reading 0.03 % of reading	Smart Manometer Omega DRO/ Transducer Dead Weight Tester Smart Manometer	CMSCP-035 GIDEP or OEM	
Surface Plates *	Up to 144 x 144 in Flatness Repeat	(12.5+ 1.0D) µin 12.5 µin	Autocollimator Repeat-o-meter	CMSCP-001 and GGG-P-463C	
Bench Micrometers *	Up to 72 in	(9.24 +3.0L) µin	Grade 1 Gage Blocks Optical Parallels Laser	CMSCP-002 GIDEP or OEM	
Linear Measuring Machines *	Up to 72 in	(9.02 +3.0L) µin	Grade 1 Gage Blocks Optical Parallels Laser	CMSCP-002 GIDEP or OEM	
Optical Comparators Profile Projectors *	0.00005 in Resolution 0.0001 in Resolution	(5 to 60) in Screen X & Y Travel to 12 in	(16.4 + 6.4L) µin (14.4 + 7.5L) µin	Glass Scales Magnification Scales Magnification Pins Precision Balls	CMSCP-003 GIDEP or OEM
Indicators *	0.00001 in Resolution 0.00005 in Resolution 0.0001 in Resolution 0.0005 in Resolution 0.001 in Resolution	Up to 6 in	(12.6 + 9.5L) µin (33.6 + 10.0L) µin (50.2 + 10.5L) µin (80.3 + 11.0L) µin (96.7 + 11.5L) µin	Calibration Tester MAC-10 Calibrator Grade 2 Gage Blocks Surface Plate	CMSCP-005 A-A-2348 GIDEP or OEM



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Calipers *	Up to 72 in .0002 Resolution .0005 Resolution .0010 Resolution	(115.5 + 8.3L) μin (288.7 + 8.3L) μin (577.4 + 8.3L) μin	Grade 2 Gage Blocks Ring Gages Surface Plate	CMSCP-006 GGG-C-111c GIDEP or OEM
Micrometers *  OD ID Bore (Intramic) Depth Point Ball Blade V Anvil Pitch Dial Head	Up to 60 in Up to 60 in Up to 12 in Up to 18 in Up to 12 in Up to 12 in Up to 12 in Up to 4 in Up to 6 in Up to 6 in Up to 2 in	(48.0 + 6.4L) μin (38.2 + 10.4L) μin (30.0 + 3.6L) μin (59.2 + 12.0L) μin (57.8 + 6.4L) μin (57.9 + 6.4L) μin (57.9 + 6.4L) μin 116 + 10.5L μin 116 + 10.5L μin (48.0 + 6.4L) μin 61.2 μin	Grade 2 Gage Blocks Ring Gages Surface Plate Optical Parallels Ball Gages  Heidenhein MT25	CMSCP-007 GGG-C-105c OEM
Cylindrical Squares Steel Blade Magnetic Combination	(2 to 12) in	(24.2 + 11.6L) μin (17 + 11.6L) μin (17 + 11.6L) μin (24.2 + 11.6L) μin	Surface Plate Test Indicator Angle Plate Cylindrical Square	CMSCP-008 GGG-S-656e' OEM
Levels Digital Protractors Inclinometers	Up to 360 °	0.28 arc sec	Grade 2 Gage Blocks Surface Plate Sine Bar Autocollimator Angle Blocks	CMSCP-009 GIDEP or OEM
Optical Flats and Optical Parallels  Flatness Parallelism	(1 to 6) in Up to 1 in	2.1 μin 3.5 μin	6" Master Flat Optical Vernier Gage Block Comparator	CMSCP-010 GIDEP or OEM
Height Gages Analog * 0.0005 in Resolution 0.001 in Resolution  Height Gages Digital * 0.00005 in Resolution 0.0001 in Resolution	Up to 60 in	289 μin 577.5 μin  (18.4 + 7.8L) μin (28.4 + 7.8L) μin	Grade 2 Gage Blocks Surface Plate	CMSCP-011 GIDEP or OEM

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Height Master * 0.00001 in Resolution 0.0001 in Resolution  Riser Blocks  Block Stacks	Up to 60 in  10 in and 12 in  Up to 48 in	(16.5 + 7.8L) μin (18.4 + 7.8L) μin  20.74 μin  (13.68 + 7.8L) μin	Grade 2 Gage Blocks Surface Plate Electronic Amplifier with Probe	CMSCP-012 GIDEP or OEM
Electronic Gage Dimensional Comparator *  0.000001 in Resolution 0.000005 in Resolution 0.00001 in Resolution	Up to 6 in	5.3 μin 6 μin 7.8 μin	Grade 2 Gage Blocks Surface Plate	CMSCP-014 GIDEP or OEM
Toolmaker's Microscope Video Scope *  0.00005 in Resolution 0.000010 in Resolution	Up to 12 in Travel X, Y, and Z	24.9 + 6.2L) μin (5.49 + 2.0L) μin	Glass Scales Laser	CMSCP-016 GIDEP and OEM
Glass Scales Stage micrometers	.001to12 in	(25.8 + 2.2L) μin	Mahr Measurement Machine /CCT Microscope	CMSCP-048 GIDEP or OEM
Autocollimator	Up to 60 arc min	0.29 arc sec	Autocollimator Optical Wedge	CMSCP-022 GIDEP and OEM
Rotary Table Dividing Heads Ultradex * Rotary Tilt	(0 to 360) ° (0 to 90) °	0.5 arc sec 1 arc sec	Autocollimator 12 Sided Polygon (30 degree)	CMSCP-024 GIDEP and OEM
Coordinate Measuring Machines *	Up to 72 in  Up to 30 ft	(48.0 + 28.3L) μin  (28.9 + 16.2L) μin	Granite Square Grade 2 Gage Blocks Ball Bar Laser	CMSCP-026 ASME B89.4.1 OEM
Thread Wires	Up to 1 in	7.6 μin	Light Wave Micrometer Microkator Master Wires	CMSCP-027 GGG-W-366b ASME B89.1.17 OEM
Ring Gages  Bore Gage Rings	(0.062 to 12) in  (0.062 to 4) in	(7.1 + 5.2L) μin  (6.5 + 4.8L) μin	I.D. Comparator  Mahr Measuring Machine	CMSCP-028 ASME B89.1.6M OEM

<b>PARAMETER / EQUIPMENT</b>	<b>RANGE</b>	<b>CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]</b>	<b>REFERENCE STANDARD OR EQUIPMENT</b>	<b>METHOD(S)</b>
Plug Gages	(0.005 to 8) in	(9.43 + 3.8L) μin	Bench Micrometer Mahr Measurement Machine	CMSCP-030 AGD Standard OEM
Gear Wires	(0.005 to 1) in	7.64 μin	Bench Micrometer Mahr Measurement Machine Grade 2 Gage Blocks	CMSCP-041 GGG-W-366b OEM
Thread Ring Gages	Up to 1 in	51.5 μin	Master Thread Setting Plugs	CMSCP-042 ASME B1.2 OEM
Angle Blocks	Up to 45 °	0.49 arc sec	Autocollimator Grade A Master Angle Blocks	CMSCP-044 GIDEP or OEM
Polygons	Up to 360 °	0.30 arc sec	Autocollimator Ultradex	CMSCP-051 GIDEP or OEM
Thread Plug Gages	Up to 10 in	12.4 μin	Bench Micrometer Mahr Measurement Machine Grade 2 Gage Blocks Grade A Thread Wire Set	CMSCP-045 ASME B1.2 OEM
Thread Ring Setting Master	Up to 10 in	12.4 μin	Bench Micrometer Mahr Measurement Machine Grade 2 Gage Blocks	CMSCP-046 ASME B1.2 OEM4
Calibration Testers	Up to 2 in	(6.1 + 3.1L)μin	Laser Grade 2 Gage Blocks Electronic Amplifier	CMSCP-047 GIDEP or OEM
Indicator Calibrators	Up to 2 in	(29.4 + 5.0L) μin	Laser Grade 2 Gage Blocks Electronic Amplifier	CMSCP-047 GIDEP or OEM
Gage Blocks	(0.01 to 0.1) in (0.1 to 4) in (4 to 20) in	(3.5 + 1.1L) μin (2.5 + 1.1L) μin (10.5 + 0.5L) μin	Laser Comparator Grades 1 and 2 Gage Blocks Optical Flat	CMSCP-050 GGG-G-15c ASME B89.1.2M OEM
Crimp Tools	All	58.1 μin	Pin Gages Point Micrometer	CMSCP-054 GIDEP or OEM
Repeat Reading Gages	All	14.2 μin	Grade 2 Gage Blocks Surface Plate	CMSCP-057 OEM

PARAMETER / EQUIPMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY [EXPRESSED AS UNCERTAINTY(±)]	REFERENCE STANDARD OR EQUIPMENT	METHOD(S)
Sunnen Gage Setting Fixtures *	Up to 4 in	58 µin	Grade 2 Gage Blocks Optical Parallels	CMSCP-058 GIDEP or OEM
Sunnen Gages *	(0.375 to 4) in	(30.0 + 3.6L) µin	Ring Gages	CMSCP-059 GIDEP or OEM
Granite and Ceramic Squares	(2 to 24) in	(14.0 + 3.8L) µin	Autocollimator Parallel Mirror Surface Plate Optical Square	CMSCP-061 GIDEP or OEM
Straight Edges	(6 to 60) in	(14.0 + 3.8L) µin	Autocollimator Parallel Mirror Surface Plate Electronic Amplifier with Probe	CMSCP-071 GIDEP or OEM
Parallels	(6 to 60) in	(14.0 + 3.8L) µin		
Penta Prism Optical Square	90 °	0.37 arc sec	Autocollimator Parallel Mirror Surface Plate	CMSCP-071 GIDEP or OEM

**Notes:**

1. Calibration and Measurement Capabilities (Expanded Uncertainties) are based on approximately a 95% confidence interval, using a coverage of  $k=2$ .
2. This laboratory's capabilities include in-laboratory and (field) on-site calibration services. Since field 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. Parameters identified with an asterisk (\*) are available for field (on-site) calibration.
4. Calibration and Measurement Capabilities displayed as percentage (%) are percent of reading unless indicated otherwise.
5. The use of (t) signifies an expression of Time in seconds.
6. The use of (L) signifies an expression of Length in inches.
7. The use of (D) signifies an expression of Diagonal length in inches.
8. This scope is part of and must be included with the Certificate of Accreditation No AC - 1376.




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Vice President

