

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
¹ RTD Temperature Indicator (Simulator) Temperature Indicator	RTD (Pt100) (-200 to 800) °C 10 Ω, Cu 427 (-100 to 260) °C	0.25 °C 0.42 °C	Fluke 744 Process Calibrator
¹ Thermocouple Temperature Indicator (Simulator) Temperature Indicator	Type E (-250 to 1 000) °C Type J (-210 to 1 200) °C Type K (-200 to 1 372) °C Type R and S (0 to 1 768) °C Type T (-250 to 400) °C	0.42 °C 0.45 °C 0.38 °C 0.96 °C 0.64 °C	Fluke 744 Process Calibrator
¹ DC Voltage Source	Up to < 330 mV 330 mV to < 3.3 V (3.3 to < 33) V (33 to < 330) V (330 to 1 000) V	48 μV/V + 9 μV 40 μV/V + 60 μV 40 μV/V + 0.6 mV 45 μV/V + 6 mV 45 μV/V + 60 mV	Fluke 5502A Multiproduct Calibrator
¹ DC Current Source	Up to < 3.3 mA (3.3 to < 33) mA (33 to < 330) mA (0.33 to < 1.1) A (1.1 to < 3) A (3.0 to < 11) A (11 to 20) A	0.08 mA/A + 85 nA 0.08 mA/A + 0.65 μA 0.08 mA/A + 7.8 μA 0.3 mA/A + 80 μA 0.3 mA/A + 85 μA 0.47 mA/A + 0.8 mA 0.78 mA/A + 5.8 mA	Fluke 5502A Multiproduct Calibrator
¹ AC Voltage Source	(1 to < 33) mV (10 to 45) Hz > 45 Hz to 10 kHz (> 10 to 20) kHz (> 20 to 50) kHz (> 50 to 100) kHz (> 100 to 450) kHz (33 to < 330) mV (10 to 45) Hz > 45 Hz to 10 kHz (> 10 to 20) kHz (> 20 to 50) kHz (> 50 to 100) kHz (> 100 to 450) kHz	1.5 mV/V + 20 μV 0.8 mV/V + 20 μV 1.5 mV/V + 20 μV 1.6 mV/V + 20 μV 3 mV/V + 30 μV 8 mV/V + 50 μV 0.5 mV/V + 20 μV 0.25 mV/V + 20 μV 0.6 mV/V + 20 μV 0.8 mV/V + 35 μV 1.9 mV/V + 0.15 mV 4 mV/V + 0.3 mV	Fluke 5502A Multiproduct Calibrator

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
¹ AC Voltage Source	(0.33 to < 3.3) V (10 to 45) Hz > 45 Hz to 10 kHz (> 10 to 20) kHz (> 20 kHz to 50) kHz (> 50 kHz to 100) kHz (> 100 kHz to 450) kHz (3.3 to < 33) V (10 Hz to 45) Hz > 45 Hz to 10 kHz (> 10 kHz to 20) kHz (> 20 kHz to 50) kHz (> 50 kHz to 90) kHz (33 to < 330) V 45 Hz to 1 kHz (> 1 to 10) kHz (> 10 kHz to 18) kHz (330 to 1 000) V 45 Hz to 1 kHz (> 1 kHz to 5) kHz (> 5 kHz to 10) kHz	0.4 mV/V + 80 μV 0.25 mV/V + 0.1 mV 0.6 mV/V + 0.1 mV 0.8 mV/V + 0.1 mV 1.9 mV/V + 0.2 mV 4 mV/V + 0.8 mV 0.4 mV/V + 0.9 mV 0.25 mV/V + 0.8 mV 0.6 mV/V + 0.9 mV 0.8 mV/V + 0.9 mV 1.9 mV/V + 2 mV 0.4 mV/V + 7 mV 0.65 mV/V + 10 mV 0.7 mV/V + 15 mV 0.4 mV/V + 60 mV 0.65 mV/V + 78 mV 0.7 mV/V + 78 mV	Fluke 5502A Multiproduct Calibrator
¹ AC Current Source	(0.029 to < 0.33) mA (20 Hz to 45) Hz > 45 Hz to 1 kHz (> 1 to 5) kHz (> 5 to 10) kHz (0.33 to < 3.3) mA (20 Hz to 45) Hz > 45 Hz to 1 kHz (> 1 to 5) kHz (> 5 to 10) kHz (3.3 to < 33) mA (20 Hz to 45) Hz > 45 Hz to 1) kHz (> 1 to 5) kHz (> 5 to 10) kHz	1.6 mA/A + 80 nA 1 mA/A + 80 nA 2.4 mA/A + 0.12 μA 6.3 mA/A + 0.16 μA 1.6 mA/A + 0.15 μA 0.8 mA/A + 0.15 μA 1.6 mA/A + 0.2 μA 4 mA/A + 0.25 μA 1.4 mA/A + 2 μA 0.32 mA/A + 1.8 μA 0.65 mA/A + 1.8 μA 1.6 mA/A + 2.5 μA	Fluke 5502A Multiproduct Calibrator

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
¹ AC Current Source	(33 to < 330) mA (20 Hz to 45) Hz > 45 Hz to 1 kHz (> 1 to 5) kHz (> 5 to 10) kHz	1.5 mA/A + 18 μA 0.32 mA/A + 18 μA 0.8 mA/A + 40 μA 1.6 mA/A + 80 μA	Fluke 5502A Multiproduct Calibrator
	(0.33 to < 1.1) A (20 to 45) Hz > 45 Hz to 1 kHz (> 1 to 5) kHz	1.4 mA/A + 0.15 mA 0.4 mA/A + 0.15 mA 5 mA/A + 0.8 mA	
	(1.1 to < 3) A (45 to 65) Hz (> 65 to 500) Hz > 500 Hz to 1 kHz (> 1 to 5) kHz	1.5 mA/A + 0.15 mA 0.5 mA/A + 0.15 mA 0.5 mA/A + 0.15 mA 4.8 mA/A + 6 mA	
	(3 to < 11) A (45 to 65) Hz > 65 Hz to 1 kHz	0.5 mA/A + 1.8 mA 0.8 mA/A + 2 mA	
¹ Resistance Source	(0 to 11) Ω	0.1 mΩ/Ω + 10 mΩ	Fluke 5502A Multiproduct Calibrator
	(11 to 33) Ω	0.1 mΩ/Ω + 15 mΩ	
	(33 to 110) Ω	80 μΩ/Ω + 15 mΩ	
	(110 to 330) Ω	80 μΩ/Ω + 20 mΩ	
	330 Ω to 1.1 kΩ	80 μΩ/Ω + 0.1 Ω	
	(1.1 to 3.3) kΩ	80 μΩ/Ω + 0.2 Ω	
	(3.3 to 11) kΩ	80 μΩ/Ω + 0.8 Ω	
	(11 to 33) kΩ	80 μΩ/Ω + 1.2 Ω	
	(33 to 110) kΩ	0.1 mΩ/Ω + 6 Ω	
	(110 to 330) kΩ	0.11 mΩ/Ω + 12 Ω	
330 kΩ to 1.1 MΩ	0.13 mΩ/Ω + 70 Ω		
(1.1 to 3.3) MΩ	0.13 mΩ/Ω + 0.15 kΩ		
(3.3 to 11) MΩ	0.48 mΩ/Ω + 1 kΩ		
(11 to 33) MΩ	0.8 mΩ/Ω + 3 kΩ		

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
¹ Capacitance Source 10 Hz to 10 kHz 10 Hz to 10 kHz 10 Hz to 3 kHz 10 Hz to 1 kHz 10 Hz to 1 kHz 10 Hz to 1 kHz 10 Hz to 1 kHz 10 Hz to 600 Hz 10 Hz to 300 Hz 10 Hz to 150 Hz 10 Hz to 120 Hz 10 Hz to 80 Hz 50 Hz 20 Hz 6 Hz 2 Hz 0.6 Hz 0.2 Hz	(0.1 to 0.5) nF (0.5 to 1.09) nF (1.1 to 3.29) nF (3.3 to 10.9) nF (11 to 32.9) nF (33 to 109.9) nF (110 to 329.9) nF (0.33 to 1.09) μF (1.1 to 3.29) μF (3.3 to 10.9) μF (11 to 32.9) μF (33 to 109.9) μF (110 to 329.9) μF (0.33 to 1.09) mF (1.1 to 3.29) mF (3.3 to 10.9) mF (11 to 32.9) mF (33 to 50) mF	0.4 % of reading + 8pF 0.4 % of reading + 10 pF 0.4 % of reading + 10 pF 0.2 % of reading + 12 pF 0.2 % of reading + 0.1 nF 0.2 % of reading + 0.1 nF 0.2 % of reading + 0.7 nF 0.2 % of reading + 1.3 nF 0.2 % of reading + 7 nF 0.2 % of reading + 10 nF 0.32 % of reading + 0.08 μF 0.37 % of reading + 0.11 μF 0.37 % of reading + 0.7 μF 0.37 % of reading + 1 μF 0.37 % of reading + 6.5 μF 0.37 % of reading + 10 μF 0.6 % of reading + 63 μF 0.85 % of reading + 98 μF	Fluke 5502A Multiproduct Calibrator
¹ DC Current Clamp Source	Up to 200 A (> 200 to 550) A (> 550 to 1 000) A	3.8 mA/A + 60 mA 3.3 mA/A + 80 mA 3.2 mA/A + 70 mA	Fluke 5502A Multiproduct Calibrator with Current Coil
¹ AC Current Clamp Source	Up to 20 A (45 to 100) Hz (> 100 to 440) Hz (> 20 to 200) A (45 to 65) Hz (> 65 to 100) Hz (> 100 to 440) Hz (> 200 to 550) A (45 to 65) Hz (> 65 to 100) Hz (> 550 to 1 000) A (45 to 65) Hz (> 65 to 100) Hz	5 mA/A + 80 mA 12 mA/A + 80 mA 5 mA/A + 80 mA 9.5 mA/A + 80 mA 14 mA/A + 80 mA 3.7 mA/A + 72 mA 9 mA/A + 60 mA 3.7 mA/A + 80 mA 9.3 mA/A + 80 mA	Fluke 5502A Multiproduct Calibrator with Current Coil

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
¹ Insulation Resistance Source Test Voltage @ 50 V, 100 V, 250 V, 500 V, 1 000 V	(0.1 to 10) MΩ (10 to 20) MΩ (20 to 30) MΩ (30 to 50) MΩ (50 to 100) MΩ (100 to 200) MΩ (200 to 500) MΩ (500 to 1 000) MΩ	5.8 kΩ 32 kΩ 69 kΩ 75 kΩ 94 kΩ 2.8 MΩ 4.5 MΩ 7.1 MΩ	Resistance Decade Box
¹ Electrical Simulation of Thermocouple Indicating Devices – Source/Measure	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 Type B (600 to 800) °C (800 to 1 000) °C (1 000 to 1 550) °C (1 550 to 1 820) °C Type E (-250 to -100) °C (-100 to -25) °C (-25 to 350) °C (350 to 650) °C (650 to 1 000) °C Type J (-210 to -100) °C (-100 to -25) °C (-25 to 150) °C (150 to 760) °C (760 to 1 200) °C Type N (-250 to -100) °C (-100 to -25) °C (-25 to 120) °C (120 to 410) °C (410 to 1 300) °C	0.46 °C 0.26 °C 0.23 °C 0.37 °C 0.56 °C 0.61 °C 0.48 °C 0.42 °C 0.46 °C 0.7 °C 0.23 °C 0.2 °C 0.23 °C 0.3 °C 0.56 °C 0.32 °C 0.28 °C 0.24 °C 0.33 °C 0.56 °C 0.32 °C 0.28 °C 0.26 °C 0.38 °C	Fluke 5502A Multiproduct Calibrator

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
¹ Electrical Simulation of Thermocouple Indicating Devices – Source/Measure	Type R (0 to 250) °C (250 to 400) °C (400 to 1 000) °C (1 000 to 1 767) °C Type S (0 to 250) °C (250 to 400) °C (400 to 1 000) °C (1 000 to 1 767) °C Type U (-200 to 0) °C (0 to 600) °C Type T (-250 to -150) °C (-150 to 0) °C (0 to 120) °C (120 to 400) °C	0.8 °C 0.5 °C 0.47 °C 0.56 °C 0.66 °C 0.51 °C 0.52 °C 0.65 °C 0.79 °C 0.38 °C 0.88 °C 0.34 °C 0.23 °C 0.21 °C	Fluke 5502A Multiproduct Calibrator
¹ Electrical Simulation of RTD Indicating Devices – Source	100 Ω, Pt385 (-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 200 Ω, Pt385 (-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	0.09 °C 0.09 °C 0.14 °C 0.14 °C 0.15 °C 0.18 °C 0.33 °C 0.08 °C 0.08 °C 0.08 °C 0.09 °C 0.18 °C 0.19 °C 0.2 °C 0.23 °C	Fluke 5502A Multiproduct Calibrator

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
¹ Electrical Simulation of RTD Indicating Devices – Source	500 Ω, Pt385		Fluke 5502A Multiproduct Calibrator
	(-200 to -80) °C	0.08 °C	
	(-80 to 0) °C	0.09 °C	
	(0 to 100) °C	0.09 °C	
	(100 to 260) °C	0.1 °C	
	(260 to 300) °C	0.13 °C	
	(300 to 400) °C	0.13 °C	
	(400 to 600) °C	0.14 °C	
	(600 to 630) °C	0.16 °C	
	1 000 Ω, Pt385		
	(-200 to -80) °C	0.08 °C	
	(-80 to 0) °C	0.09 °C	
	(0 to 100) °C	0.09 °C	
	(100 to 260) °C	0.1 °C	
	(260 to 300) °C	0.13 °C	
	(300 to 400) °C	0.13 °C	
	(400 to 600) °C	0.14 °C	
	(600 to 630) °C	0.16 °C	
	100 Ω, Pt3916		
	(-200 to -190) °C	0.36 °C	
	(-190 to -80) °C	0.08 °C	
	(- 80 to 0) °C	0.09 °C	
	(0 to 100) °C	0.11 °C	
	(100 to 260) °C	0.11 °C	
(260 to 300) °C	0.13 °C		
(300 to 400) °C	0.14 °C		
(400 to 600) °C	0.15 °C		
(600 to 630) °C	0.33 °C		
100 Ω, Pt3926			
(-200 to - 80) °C	0.08 °C		
(-80 to 0) °C	0.09 °C		
(0 to 100) °C	0.12 °C		
(100 to 300) °C	0.14 °C		
(300 to 400) °C	0.16 °C		
(400 to 630) °C	0.18 °C		

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
¹ DC Power Source	(0.33 to 1 000) V, Up to 0.33 A (0.108 9 to < 330) W (0.33 to 1 000) V, (0.33 to < 3) A 330 W to < 3 kW (0.33 to 1 000) V, (3 to < 10.9) A (3.0 to < 10.9) kW (0.33 to 1 000) V, (10.99 to 20) A (10.9 to 20) kW	0.10 mW/W + 6 mW 0.31 mW/W + 60 mW 0.5 mW/W + 0.6 W 0.81 mW/W + 0.6 W	Fluke 5502A Multiproduct Calibrator
¹ AC Power Source	(45 to 65) Hz, PF=1 (0.33 to 1 000) V Up to 0.329 A (0.109 to < 10.9) W (10.9 to < 330) W (0.33 to 1 000) V, (0.33 to < 3) A 330 W to < 3 kW (0.33 to 1 000) V, (3 to < 10.9) A (3 to < 3.5) kW (3.5 to < 10.9) kW (0.33 to 1 000) V, (10.9 to 20) A (10.9 to 20) kW	0.55 mW/W + 1.5 mW 0.8 mW/W + 6 mW 1.2 mW/W + 60 mW 1.4 mW/W + 60 mW 1.4 mW/W + 0.6 W 1.2 mW/W + 0.6 W	Fluke 5502A Multiproduct Calibrator
¹ DC Voltage Measure	Up to 100 mV (> 0.1 to 1) V (> 1 to 10) V (> 10 to 100) V (>100 to 1 000) V	14 μV/V + 0.35 μV 4.9 μV/V + 0.35 μV 4.7 μV/V + 0.58 μV 7 μV/V + 35 μV 21 μV/V + 0.12 mV	HP 3458A 8.5 Digit Multimeter
¹ AC Voltage Measure	100 mV to 10 V (10 to 50) Hz > 50 Hz to 1 kHz (> 1 to 20) kHz (> 20 to 50) kHz (> 50 to 100) kHz (> 100 to 300) kHz > 300 kHz to 1 MHz	85 μV/V + 0.46 mV 85 μV/V+0.23 mV 0.16 mV/V+0.23 mV 0.35 mV/V +0.23 mV 0.93 mV/V+0.23 mV 3.5 mV/V+1.2 mV 12 mV/V+1.2 mV	HP 3458A 8.5 Digit Multimeter

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
¹ AC Voltage Measure	(> 10 to 100) V (10 to 50) Hz > 50 Hz to 1kHz (> 1 to 20) kHz (> 20 to 50) kHz (> 50 to 100) kHz (> 100 to 1 000) V (10 to 50) Hz > 50 Hz to 1 kHz (> 1 to 20) kHz (> 20 to 50) kHz (> 50 to 100) kHz	0.23 mV/V + 4.6 mV 0.23 mV/V + 2.3 mV 0.23 mV/V + 2.3 mV 0.41 mV/V + 2.3 mV 1.4 mV/V + 2.3 mV 0.46 mV/V + 46 mV 0.46 mV/V + 23 mV 0.69 mV/V + 23 mV 1.4 mV/V + 23 mV 3.5 mV/V + 23 mV	HP 3458A 8.5 Digit Multimeter
¹ DC Current Measure	(> 10 to 100) μ A (> 0.1 to 1) mA (> 1.0 to 10) mA (> 10 to 100) mA (> 0.10 to 1.0) A	24 μ A/A + 0.92 nA 24 μ A/A + 5.8 nA 24 μ A/A + 58 nA 41 μ A/A + 0.58 μ A 0.13 mA/A + 12 μ A	HP 3458A 8.5 Digit Multimeter
¹ DC Current Measure	(>1 to 3) A	2.4 mA/A + 1.1 mA	Keysight 34460A 6.5 Digit Multimeter
¹ AC Current Measure	(0.1 to 1) mA (10 to 20) Hz (>20 to 45) Hz (>45 to 100) Hz >100 Hz to 1 kHz (1 to 100) mA (10 to 20) Hz (>20 to 45) Hz (>45 to 100) Hz >100 Hz to 1 kHz (0.1 to 1) A (10 to 20) Hz (>20 to 45) Hz (>45 to 100) Hz >100 Hz to 1 kHz	4.6 mA/A + 0.35 μ A 1.7 mA/A + 0.35 μ A 0.7 mA/A + 0.35 μ A 0.7 mA/A + 0.35 μ A 4.6 mA/A + 0.23 mA 1.7 mA/A + 23 μ A 0.7 mA/A + 23 μ A 0.35 mA/A + 23 μ A 4.6 mA/A + 0.23 mA 1.8 mA/A + 0.23 mA 0.93 mA/A + 0.23 mA 1.2 mA/A + 0.23 mA	HP 3458A 8.5 Digit Multimeter
¹ AC Current Measure	(>1 to 3) A 50 Hz to 5 kHz	2.7 mA/A + 2 mA	Keysight 34460A 6.5 Digit Multimeter

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
¹ Resistance Measure	Up to 10 Ω (> 10 to 100) Ω > 100 Ω to 1 kΩ (> 1 to 10) kΩ (> 10 to 100) kΩ (> 0.1 to 1) MΩ (> 1 to 10) MΩ (> 10 to 100) MΩ > 100 MΩ to 1 GΩ	18 μΩ/Ω + 58 μΩ 14 μΩ/Ω + 0.58 mΩ 12 μΩ/Ω + 0.58 mΩ 1 μΩ/Ω + 5.8 mΩ 12 μΩ/Ω + 58 mΩ 19 μΩ/Ω + 2.3 Ω 59 μΩ/Ω + 0.12 kΩ 0.58 mΩ/Ω + 1.2 kΩ 5.8 mΩ/Ω + 12 kΩ	HP 3458A 8.5 Digit Multimeter
¹ DC High Voltage Measure	Up to 1 kV (> 1 to 3) kV (> 3 to 5) kV (> 5 to 10) kV	24 mV/V + 60 μV 24 mV/V + 70 μV 24 mV/V + 90 μV 24 mV/V + 0.18 mV	Keysight 34460A 6.5 Digit Multimeter with Fluke 80K-40 High Voltage Probe
¹ AC High Voltage Measure	(1 to 6) kV (50 to 60) Hz	58 mV/V + 4 mV	Keysight 34460A 6.5 Digit Multimeter with Fluke 80K-40 High Voltage Probe
LCR Meter Inductance (L)	1 μH to 10 H @ 100 mV, 1 V, 1 kHz	1.2 % of reading + 0.9 μH	IET 1492 Decade Inductor
LCR Meter Capacitance (C)	1 pF to 1 μF @ 1 V, 1 kHz	0.06 % of reading + 0.6 pF	General Radio 1413 Precision Decade Capacitor
LCR Meter Resistance (R)	1 Ω to 100 kΩ @ 1 V, 1 kHz	0.2 % of reading + 2.4 mΩ	Decade Resistance Box
Inductance Source	1 μH to 10 H @ 1 V, 1 kHz	0.06 % of reading	Agilent E4980A LCR Meter
Capacitance Source	1pF to 1μF @ 1 V, 0.1 kHz to 1 MHz	0.06 % of reading	Agilent E4980A LCR Meter
¹ Oscilloscope Vertical Deflection DC 50 Ω and 1 MΩ	2 mV 5 mV 10 mV 20 mV 50 mV 100 mV 200 mV 500 mV 1 V 2 V 5 V 10 V 20 V	0.84 % of reading 0.49 % of reading 0.34 % of reading 0.26 % of reading 0.29 % of reading 0.23 % of reading 0.21 % of reading 0.28 % of reading 0.27 % of reading 0.22 % of reading 0.28 % of reading 0.2 % of reading 0.2 % of reading	Fluke 5502A Multiproduct Calibrator, Fluke PM6685R Universal Frequency Counter, HP 3458A 8.5 Digit Multimeter

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
¹ Oscilloscope Vertical Bandwidth 3 dB down from Reference Amplitude	50 kHz to 100 MHz (>100 to 300) MHz	1.4 % of reading 1.8 % of reading	Fluke 5502A Multiproduct Calibrator, Fluke PM6685R Universal Frequency Counter, HP 3458A 8.5 Digit Multimeter
¹ Oscilloscope Horizontal Deflection: Time Mark	1 ns 2 ns 5 ns 10 ns 20 ns 50 ns 100 ns 200 ns 500 ns 1 μs 2 μs 5 μs	0.01 % of reading 0.04 % of reading 0.01 % of reading 0.01 % of reading 0.04 % of reading 0.01 % of reading 0.01 % of reading 0.04 % of reading 0.01 % of reading 0.01 % of reading 0.04 % of reading 0.01 % of reading	Fluke 5502A Multiproduct Calibrator
¹ Oscilloscope Horizontal Deflection: Time Mark	10 μs 20 μs 50 μs 100 μs 200 μs 500 μs 1 ms 2 ms 5 ms 10 ms 20 ms 50 ms 100 ms 200 ms 500 ms 1 s 2 s 5 s 10 s	0.01 % of reading 0.04 % of reading 0.01 % of reading 0.01 % of reading 0.04 % of reading 0.01 % of reading 0.01 % of reading 0.04 % of reading 0.01 % of reading 0.01 % of reading 0.04 % of reading 0.01 % of reading 0.01 % of reading 0.04 % of reading 0.01 % of reading 0.62 % of reading 1.2 % of reading 3.1 % of reading 6.2 % of reading	Fluke 5502A Multiproduct Calibrator

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
¹ Oscilloscope DC Accuracy 50 Ω and 1 MΩ (Digital)	2 mV 5 mV 10 mV 20 mV 50 mV 100 mV 200 mV 500 mV 1 V 2 V 5 V 10 V 20 V	0.11 % of reading 0.39 % of reading 0.19 % of reading 0.1 % of reading 0.38 % of reading 0.19 % of reading 0.1 % of reading 0.38 % of reading 0.19 % of reading 0.1 % of reading 0.04 % of reading 0.02 % of reading 0.01 % of reading	Fluke 5502A Multiproduct Calibrator, Fluke PM6685R Universal Frequency Counter, HP 3458A 8.5 Digit Multimeter
^{1,3} Oscilloscope Time Base	10 MHz	$2.4 \times 10^{-10} f$	Fluke 5502A Multiproduct Calibrator, Fluke PM6685R Universal Frequency Counter, HP 3458A 8.5 Digit Multimeter
¹ Oscilloscope Calibrator Calibration	$\leq 10 \text{ V}_{p-p} @ \leq 10 \text{ kHz}$	0.02 % of reading	Fluke 5502A Multiproduct Calibrator, Fluke PM6685R Universal Frequency Counter, HP 3458A 8.5 Digit Multimeter
Rise Time, Fall Time, Phase Source	Rise/Fall Time 10 ns to 10 ms Phase (0 to 360) °	2 ns 1.2 °	Fluke PM6685R Universal Frequency Counter, Agilent 53132A Universal Frequency Counter
Single and Three Phase Power Meter	AC Voltage @ 50/60 Hz (0 to 600) V AC Current @ 50/60 Hz (0 to 1 000) A AC Power @ 50/60 Hz (0 to 60) kW Power Factor (0.5 to 1)	0.58 % of reading 1.3 % of reading 1.3 % of reading 1.2 % of reading	Power Meter, Hioki 3197 And Clamp Sensor, Hioki 9669 (Compare with Power Meter Standard)