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

FLUKE CORPORATION
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CALIBRATION

Valid To: April 30, 2020 Certificate Number: 2166.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory at the location listed above as well as the one satellite laboratory location listed below to perform the following calibrations[1, 13]:

I. Dimensional

Parameter/Equipment	Range	(±) CMC[2, 3]	Comments
Micrometers	Up to 1 in	(30 + 2.0*L*) µin	Gage blocks
Super Micrometers	Up to 1 in	(8.0 + 8.0*L*) µin	Gage blocks
Calipers	Up to 6 in	(138 + 1.0*L*) µin	Gage blocks
Dial Indicators	Up to 1 in	(93 + 2.0*L*) µin	Gage blocks
RF Connector Gages	Type N 3.5 & 2.92	0.000 20 in	Super micrometer
Comments	For procedures used in Fluke internal dimensional lab		

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II. Electrical – DC/Low Frequency

DC VOLTAGE			
Parameter/Equipment	**Range**	**(±) CMC[2, 4, 5, 7]**	**Comments**
DC Voltage Measuring Devices (Fixed Points)	± 100 mV ± 5 V ± 15 V ± 19 V ± 100 V ± 1 kV	3.0 µV/V 0.90 µV/V 0.60 µV/V 0.70 µV/V 0.80 µV/V 0.90 µV/V	Calibration of reference multimeters w/ Fluke 5720/5725A characterized calibrator For long scale DMM calibrations
DC Reference Measure and Generate (Fixed Points)	± 10 V reference ± 1.018 V reference ± 1.00 V reference	0.30 µV/V 0.70 µV/V 0.70 µV/V	Direct transfer techniques performed utilizing Fluke 732A/732B For 732 transfer calibrations
DC Voltage Measure	0.00 V	0.15 µV	Copper short
	± (10 to 120) mV ± 120 mV to ± 1.2 V ± (1.2 to 12) V ± (12 to 120) V ± 120 V to ± 1.05 kV	3.0 µV/V + 0.10 µV 0.70 µV/V + 0.20 µV 0.50 µV/V + 0.50 µV 0.8 µV/V + 20 µV 1.9 µV/V + 0.15 mV	HP 3458A characterized DMM Utilized in 57XX and 55XX calibrations
	(1.0 to 40) kV	0.10 %	Direct measurements using Ross VD120 voltage divider/Fluke 8846A For calibration of 5320A & 80K high voltage probes
DC Voltage Generate	± (10 to 220) mV ± 220 mV to ± 2.2 V ± (2.2 to 11) V ± (11 to 22) V ± (22 to 220) V ± 220 V to ± 1.1 kV	3.0 µV/V + 0.30 µV 1.0 µV/V + 1.0 µV 0.60 µV/V + 2.5 µV 0.60 µV/V + 5.0 µV 1.0 µV/V + 50 µV 1.2 µV/V + 0.20 mV	Characterization of Fluke 5720/5725A with 732, 752, and 845 for DC voltage sourcing applications

DC CURRENT			
Parameter/Equipment	**Range**	**(±) CMC[2, 4, 5, 6, 7]**	**Comments**
DC Current Measure	± 100 µA ± 1 mA ± 10 mA ± 100 mA ± 1 A ± 10 A	3.0 µA/A 3.0 µA/A 3.0 µA/A 5.0 µA/A 10 µA/A 30 µA/A	Characterization of Fluke 5720/5725A with comparison to DC reference shunts and characterized voltmeter, for calibration of long scale DMMS
DC Current measuring devices	± 100 µA ± 1 mA ± 10 mA ± 100 mA ± 1 A ± 10 A	5.0 µA/A 4.7 µA/A 3.0 µA/A 8.0 µA/A 10 µA/A 100 µA/A	Calibration of reference multimeter with Fluke 5720/5725A characterized calibrator
DC Current clamp meters	± (10 to 16.5) A ± (16.5 to 150) A ± (150 to 1025) A	0.39 % + 16 mA 0.39 % + 0.11 A 0.39 % + 0.39 A	Fluke 5522A, Fluke 5500A/COIL, and a Fluke 8846A
DC Current Measure	0.00 A	0.000 060 µA	Open input
	± (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 ± (1 to 10) A ± (10 to 20) A	6.0 µA/A + 10 pA 6.0 µA/A + 60 pA 6.0 µA/A + 1.0 nA 6.0 µA/A + 10 nA 6.0 µA/A + 0.10 µA 6.0 µA/A + 1.8 µA 5.0 µA/A + 5.0 µA 55 µA/A + 0.20 µA	Standard reference resistors, shunts and an 8.5-digit DMM 52120A, 55XX and 57XX calibrations
	± (80 to 120) A	35 µA/A	Fluke 52120A transconductance amplifier calibration

RESISTANCE			
Parameter/Equipment	**Range**	**(±) CMC[2, 4, 5, 6, 7]**	**Comments**
Resistance Measure	0.00 Ω	2.5 μΩ	Copper short
	100 GΩ 1 TΩ	0.040 % 0.040 %	Ohms lab reference resistors
	10 TΩ	0.090 %	5320 calibration station characterization
Resistance Measure & Generate	(0.0001 to 0.01) Ω (0.01 to 0.1) Ω (0.1 to 1) Ω (1 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 1.1 GΩ	6.0 μΩ 5.0 μΩ/Ω 1.0 μΩ/Ω 0.50 μΩ/Ω 0.50 μΩ/Ω 0.50 μΩ/Ω 0.70 μΩ/Ω 0.70 μΩ/Ω 1.6 μΩ/Ω 2.2 μΩ/Ω 5.1 μΩ/Ω 26 μΩ/Ω	Calibration of standard resistors with MI 6010 bridge For 742 standard resistance calibrations and Long scale meter calibration station characterization
	10 GΩ	0.028 %	8508A Calibration
Resistance Measuring Devices	2 GΩ 4 GΩ 8 GΩ 10 GΩ 100 GΩ 1 TΩ 9 TΩ	0.15 % 0.15 % 0.15 % 0.15 % 0.20 % 0.50 % 0.90 %	Calibration of Fluke 5320A using QuadTech 1865 megohmmeter and reference resistors

(Table 1 of 2)
AC Voltage Phase Measure (*Fixed Points*)

Frequency	AC Voltage (±) CMC[2, 4, 5, 6, 7]					
	0.25 V	1.5 V	2.4 V	10 V	23 V	45 V
16 Hz	0.8	1.0	0.7	1.4	1.4	1.4
40 Hz	1.8	1.9	0.7	2.2	2.1	2.1
50 Hz	2.3	2.3	0.8	2.6	2.5	2.5
60 Hz	2.7	2.8	1.1	3.0	2.9	2.9
120 Hz	5.4	5.4	1.3	5.7	5.7	5.7
180 Hz	8.0	8.2	2.1	8.3	8.2	8.2
450 Hz	20	20	3.6	21	21	21
850 Hz	38	38	6.4	39	38	38
1.2 kHz	54	54	9.2	55	54	54
1.8 kHz	80	80	14	82	81	81
2.4 kHz	110	110	18	110	110	110
3 kHz	140	140	22	140	140	140
3.6 kHz	160	160	26	170	170	170
4.2 kHz	190	190	31	190	190	190
4.8 kHz	220	220	35	220	220	220
5.4 kHz	240	240	40	250	250	250
6 kHz	270	270	44	270	270	270
Comments	Uncertainty applies from 10% to 100% of range and are in m˚.					
	These uncertainties apply when measuring the phase of the 6100A voltage channel output with respect to the "master phase reference" signal at the rear of the instrument. The 2.4 V range is only accessible to drive the Fluke 52120A Transconductance Amplifier, the uncertainties for this range assume a combined 61xx & 52120A cal system using the same HP3458A.					

(Continued, 2 of 2)
AC Voltage Phase Measure (*Fixed Points*)

Frequency	**AC Voltage (±) CMC**[2, 4, 5, 6, 7]				
	90 V Range Linearity				
	7 V	90 V	180 V	360 V	1008 V
16 Hz	3.4	1.4	1.4	1.4	1.5
40 Hz	3.7	2.1	2.1	2.2	2.2
50 Hz	3.9	2.5	2.5	2.6	2.6
60 Hz	4.2	2.9	2.9	3.0	3.0
120 Hz	6.3	5.7	5.7	5.7	5.7
180 Hz	8.7	8.2	8.2	8.3	8.3
450 Hz	21	21	21	21	21
850 Hz	39	38	38	39	39
1.2 kHz	54	54	54	55	54
1.8 kHz	81	81	81	81	81
2.4 kHz	110	110	110	110	110
3 kHz	140	140	140	140	140
3.6 kHz	170	170	170	170	170
4.2 kHz	190	190	190	190	190
4.8 kHz	220	220	220	220	220
5.4 kHz	250	250	250	250	250
6 kHz	270	270	270	270	270
Comments	Uncertainty applies from 10% to 100% of range and are in m˚.				
	These uncertainties apply when measuring the phase of the 6100A voltage channel output with respect to the "master phase reference" signal at the rear of the instrument. The 2.4 V range is only accessible to drive the Fluke 52120A Transconductance Amplifier, the uncertainties for this range assume a combined 61xx & 52120A cal system using the same HP3458A.				

(Table 1 of 2)
AC Current Phase Measure (*Fixed Points*)

Frequency	AC Current (±) CMC[2, 4, 5, 6, 7]				
	0.1 A	0.5 A	1 A	2 A	5 A
16 Hz	1.0	1.0	1.0	1.0	1.0
40 Hz	1.9	1.9	1.9	1.9	1.9
50 Hz	2.4	2.4	2.4	2.4	2.4
60 Hz	2.8	2.8	2.8	2.8	2.8
120 Hz	5.4	5.4	5.4	5.4	5.4
180 Hz	8.1	8.1	8.0	8.0	8.1
450 Hz	20	20	20	20	20
850 Hz	38	38	38	38	38
1.2 kHz	54	54	54	54	54
1.8 kHz	80	80	80	80	80
2.4 kHz	110	110	110	110	110
3 kHz	140	140	140	140	140
3.6 kHz	160	160	160	160	160
4.2 kHz	190	190	190	190	190
4.8 kHz	220	220	220	220	220
5.4 kHz	240	240	240	240	240
6 kHz	270	270	270	270	270
Comments	Uncertainty applies from 10% to 100% of range and are in m˚.				
	These uncertainties apply when measuring the phase of the 6100A voltage channel output with respect to the "master phase reference" signal at the rear of the instrument.				

(Continued, 2 of 2)
AC Current Phase Measure (*Fixed Points*)

Frequency	AC Current (±) CMC[2, 4, 5, 6, 7]				
	10 A Range Linearity				
	0.5 A	10 A	20 A	50 A	100 A
16 Hz	3.6	1.0	1.0	1.0	1.0
40 Hz	3.9	1.9	1.9	1.9	1.9
50 Hz	4.1	2.4	2.4	2.4	2.4
60 Hz	4.3	2.8	2.8	2.8	2.8
120 Hz	6.9	5.4	5.4	5.4	5.4
180 Hz	9.2	8.1	8.1	8.1	8.1
450 Hz	21	20	21	21	21
850 Hz	38	38	38	38	38
1.2 kHz	54	54	54	54	54
1.8 kHz	81	80	81	81	81
2.4 kHz	110	110	110	110	110
3 kHz	140	140	140	140	140
3.6 kHz	160	160	170	170	170
4.2 kHz	190	190	190	190	190
4.8 kHz	220	220	220	220	220
5.4 kHz	240	240	250	250	250
6 kHz	270	270	270	270	270
Comments	Uncertainty applies from 10% to 100% of range and are in m˚.				
	These uncertainties apply when measuring the phase of the 6100A voltage channel output with respect to the "master phase reference" signal at the rear of the instrument.				

Channel to Channel Phase Difference Measure (*Fixed Points*)				
Frequency	**Voltage channel relative to: (±) CMC**[2, 4, 5, 6, 7]			
	Any other Voltage Channel	Any Current Range (Percent of Range)		Another measurement using the same calibration system voltage range
		10%	100%	
16 Hz	1.30	4.3	1.1	1.30
40 Hz	1.40		1.2	
50 Hz		4.4		
60 Hz	1.4			
120 Hz	1.9	5.4	1.7	
180 Hz	2.8	5.5	2.3	1.7
450 Hz	5.7	6.3	4.9	
850 Hz	11.0	10.4	8.9	
1.2 kHz	16	14	14	5.1
1.8 kHz	23	20	20	
2.4 kHz	30	26	26	
3 kHz	37	32	32	
3.6 kHz	45	38	38	
4.2 kHz	52	44	44	6.5
4.8 kHz	60	50	50	9.4
5.4 kHz	67	57	57	
6 kHz	74	63	63	
Comments	Uncertainty applies from 10% to 100% of range and are in m˚.			
	61XX calibration station			

Phase Measuring Devices			
Range	**Frequency**	**(±) CMC[2, 4, 6, 7, 14]**	**Comments**
0°	(201 to 1000) kHz	(freq * 2.0 E-08)°	Coupler
(0 to 360)°	1 Hz to 6.25 kHz (6.25 to 100) kHz	10 m° 46 m°	Clarke Hess 5500 phase standard
Comments	For calibration of Fluke internal phase meters		

Phase Measure		
Range	**Frequency**	**(±) CMC[2, 4, 6, 7, 14]** (Phase)
(0 to 360)°	5 Hz to 2 kHz	0.02 °
	2 kHz to 5 kHz	0.03 °
	5 kHz to 10 kHz	0.04 °
	10 kHz to 50 kHz	0.05 °
Comments	Clarke-Hess 6000A used in calibration of 55XX calibrators	

AC Resistance measuring devices and **AC Resistance** Measure **(±) CMC**[2, 4, 5, 6, 7]				
AC Resistance	**Frequency**			**Comments**
	60 Hz	100 Hz	1 kHz	
(25 to 500) mΩ	0.31 %			Calibration of Fluke 5320A (ground bond resistance decade f = 60 Hz)
(1 to 180) Ω	0.12 %			
(0.5 to 1.8) kΩ	0.08 %			
1 Ω		0.25 %	0.085 %	General Radio 1689M For calibration of 55XX station and 63XX transfer resistors
5 Ω		0.055 %	0.027 %	
(10 to 1000) Ω		0.050 %	0.025 %	
10 kΩ			0.027 %	
100 kΩ			0.025 %	
2 MΩ		0.20 %	0.070 %	
100 MΩ		8.5 %	3.0 %	
10 kΩ to 5 MΩ	0.20 %			Calibration of Fluke 5320A load

(Table 1 of 4)
AC Voltage measuring devices (*Fixed Points*)

Frequency	**AC Voltage (±) CMC**[2, 4, 5, 6, 7]					
	0.6 mV	2 mV	6 mV	20 mV	60 mV	200 mV
10 Hz		0.020 %	80 µV/V	70 µV/V	0.010 %	35 µV/V
20 Hz				60 µV/V	67 µV/V	23 µV/V
100 Hz				40 µV/V	47 µV/V	18 µV/V
1 kHz	0.070 %				38 µV/V	
10 kHz					48 µV/V	
20 kHz					53 µV/V	17 µV/V
50 kHz				50 µV/V	72 µV/V	23 µV/V
100 kHz		0.022 %	90 µV/V	85 µV/V	0.014 %	36 µV/V
300 kHz		0.030 %	0.021 %	0.020 %	0.027 %	80 µV/V
500 kHz		0.036 %	0.026 %	0.025 %	0.035 %	0.011 %
1 MHz		0.13 %	0.055 %	0.04 %	0.041 %	0.018 %
Comments	Fluke 792 AC/DC transfer standard (w/AC divider if needed) to calibrate Fluke 5790A					

(Continued, 2 of 4)
AC Voltage measuring devices (*Fixed Points*)

Frequency	**AC Voltage (±) CMC**[2, 4, 5, 6, 7]					
	600 mV	1 V	2 V	6 V	10V	19 V
10 Hz	26 µV/V	26 µV/V	25 µV/V	25 µV/V	26 µV/V	
20 Hz	20 µV/V	23 µV/V	20 µV/V	20 µV/V	22 µV/V	
30 Hz		20 µV/V			21 µV/V	
40 Hz		17 µV/V			18 µV/V	
55 Hz		15 µV/V			17 µV/V	
100 Hz	10 µV/V		7 µV/V	8.0 µV/V		
300 Hz					9.0 µV/V	
1 kHz	12 µV/V		6 µV/V	8.0 µV/V		8.0 µV/V
3 kHz		7 µV/V			8.0 µV/V	
10 kHz	11 µV/V		6 µV/V	7.0 µV/V		
20 kHz	11 µV/V				9.0 µV/V	
30 kHz						
50 kHz	10 µV/V	8 µV/V	8 µV/V	7.0 µV/V	10 µV/V	
60 kHz						
100 kHz	12 µV/V	10 µV/V	10 µV/V	8.0 µV/V	11 µV/V	
300 kHz	30 µV/V	25 µV/V	25 µV/V	23 µV/V	23 µV/V	
500 kHz	32 µV/V	26 µV/V	26 µV/V	28 µV/V	28 µV/V	
1 MHz	65 µV/V	45 µV/V	45 µV/V	45 µV/V	45 µV/V	
Comments	Fluke 792 AC/DC transfer standard (w/AC divider if needed) to calibrate 5790A and 8508A					

(Continued, 3 of 4)
AC Voltage measuring devices (*Fixed Points*)

Frequency	**AC Voltage (±) CMC**[2, 4, 5, 6, 7]				
	20 V	60 V	100 V	200 V	500 V
10 Hz	25 µV/V	26 µV/V	26 µV/V	36 µV/V	
20 Hz	30 µV/V	22 µV/V	22 µV/V	23 µV/V	
50 Hz					24 µV/V
55 Hz					
100 Hz	8.0 µV/V	10 µV/V	10 µV/V	18 µV/V	
300 Hz					20 µV/V
1 kHz	8.0 µV/V	10 µV/V			15 µV/V
3 kHz					
10 kHz	8.0 µV/V	10 µV/V	10 µV/V	13 µV/V	
20 kHz				14 µV/V	
30 kHz					17 µV/V
50 kHz	8.0 µV/V	12 µV/V	12 µV/V	16 µV/V	
100 kHz	10 µV/V	15 µV/V	15 µV/V	21 µV/V	
300 kHz	25 µV/V	30 µV/V	30 µV/V		
500 kHz	30 µV/V				
1 MHz	45 µV/V				
Comments	Fluke 792 AC/DC transfer standard (w/AC divider if needed) to calibrate 5790A and 8508A				

Frequency	**AC Voltage (±) CMC**[2, 4, 5, 6, 7]
	5 V
1 kHz	0.040 %
Comments	Calibration of 8508A

(Continued, 4 of 4)
AC Voltage measuring devices (*Fixed Points*)

Frequency	AC Voltage (±) CMC[2, 4, 5, 6, 7]							
	10 mV	100 mV	500 mV	50 V	250 V	600 V	700 V	1000 V
10 Hz								50 µV/V
15 Hz					40 µV/V			
20 Hz		74 µV/V						21 µV/V
40 Hz		32 µV/V	18 µV/V			23 µV/V		
55 Hz		37 µV/V						
100 Hz						21 µV/V		
300 Hz		45 µV/V						
1 kHz	0.027 %	36 µV/V	12 µV/V			15 µV/V		18 µV/V
3 kHz		40 µV/V						
10 kHz		35 µV/V				15 µV/V		
20 kHz		40 µV/V	11 µV/V			16 µV/V		19 µV/V
30 kHz		50 µV/V						24 µV/V
50 kHz		60 µV/V				20 µV/V	28 µV/V	40 µV/V
60 kHz		84 µV/V						
100 kHz		100 µV/V	23 µV/V			40 µV/V	38 µV/V	50 µV/V
300 kHz		200 µV/V	70 µV/V	40 µV/V				
1 MHz		0.12 %	0.014 %					
Comments	Calibration of Fluke 5790A or reference multimeter							

Frequency	AC Voltage (±) CMC[2, 4, 5, 6, 7]	
	1 V	3 V
2 MHz	0.60 %	0.50 %
4 MHz		
8 MHz		
10 MHz		
Comments	Calibration of reference multimeter	

AC Voltage Measuring Devices				
Frequency	**AC Voltage (±) CMC[2, 4, 5, 6, 7]**			
	(1 to 2.2) mV	(2.2 to 22) mV	(22 to 220) mV	(0.22 to 2.2) V
(10 to 20) Hz	0.33 % + 4 µV	0.030 % + 4.0 µV	0.030 % + 12 µV	0.030 % + 40 µV
(20 to 40) Hz	0.34 % + 4 µV	0.020 % + 4.0 µV	97 µV/V + 7.0 µV	95 µV/V + 7.0 µV
40 Hz to 20 kHz			82 µV/V + 7.0 µV	49 µV/V + 8.0 µV
(20 to 50) kHz	0.35 % + 4 µV	0.030 % + 4.0 µV	0.030 % + 7.0 µV	80 µV/V + 10 µV
(50 to 100) kHz	0.38 % + 5 µV	0.060 % + 5.0 µV	0.050 % + 17 µV	0.020 % + 30 µV
(100 to 300) kHz	0.47 % + 20 µV	0.11 % + 10 µV	0.090 % + 20 µV	0.050 % + 80 µV
(300 to 500) kHz	0.61 % + 10 µV	0.15 % + 20 µV	0.14 % + 25 µV	0.10 % + 0.20 mV
(0.5 to 1) MHz	0.71 % + 20 µV	0.28 % + 20 µV	0.27 % + 45 µV	0.18 % + 0.30 mV
Comments	Fluke 5720A Series II For calibration of Long scale and bench DMMs			

Frequency	**AC Voltage (±) CMC[2, 4, 5, 6, 7]**		
	(2.2 to 22) V	(22 to 220) V	(220 to 1000) V
(10 to 20) Hz	0.030 % + 0.40 mV	0.030 % + 4.0 µV	0.030 % + 16 µV
(20 to 40) Hz	95 µV/V + 0.15 mV	97 µV/V + 1.5 µV	
(40 to 50) Hz	49 µV/V + 50 µV	56 µV/V + 0.60 µV	94 µV/V + 4.0 µV
(50 to 1000) Hz			77 µV/V + 3.5 µV
(1 to 20) kHz			0.020 % + 6.0 µV
(20 to 30) kHz	80 µV/V + 0.10 mV	90 µV/V + 1.0 µV	0.060 % + 11 µV
(30 to 50) kHz			
(50 to 100) kHz	0.020 % + 0.20 mV	0.020 % + 2.5 µV	0.23 % + 45 µV
(100 to 300) kHz	0.030 % + 0.60 mV		
(300 to 500) kHz	0.10 % + 2.0 mV		
(0.5 to 1) MHz	0.16 % + 3.2 mV		
Comments	Fluke 5720A Series II (w/ a Fluke 5725A if needed) For calibration of Long scale and bench DMMs		

(Table 1 of 2)
AC Voltage Measure

Frequency	AC Voltage (±) CMC[2, 4, 5, 6, 7]			
	0.6 mV	(1 to 2.2) mV	(2.2 to 7) mV	(7 to 22) mV
(9.5 to 10) Hz		780 µV/V + 1.2 µV	780 µV/V + 1.2 µV	780 µV/V + 1.2 µV
(10 to 20) Hz		0.026 % + 1 µV	0.014 % + 1 µV	70 µV/V + 1 µV
(20 to 40) Hz			0.011 % + 1 µV	
(40 to 1000) Hz		0.028 % + 1 µV		50 µV/V + 1 µV
1 kHz	0.20 %			
(1 to 20) kHz				
(20 to 50) kHz		0.029 % + 1.6 µV	0.011 % + 1.6 µV	60 µV/V + 1.6 µV
(50 to 100) kHz		0.032 % + 1.9 µV	0.018 % + 1.9 µV	0.01 % + 1.9 µV
(100 to 300) kHz		0.053 % + 3.1 µV	0.048 % + 3.1 µV	0.024 % + 3.1 µV
(300 to 500) kHz		0.073 % + 4.7 µV	0.059 % + 4.7 µV	0.032 % + 4.7 µV
(0.5 to 1) MHz		0.19 % + 4.7 µV	0.085 % + 4.7 µV	0.049 % + 4.7 µV
Comments	Fluke 792A or Fluke 5790A transfer standard for Calibration of Long scale DMM calibration stations, 55XX and 57XX calibrators			

Frequency	AC Voltage (±) CMC[2, 4, 5, 6, 7]			
	(22 to 70) mV	(70 to 220) mV	(220 to 700) mV	(0.7 to 2.2) V
(9.5 to 10) Hz	780 µV/V + 1.2 µV	780 µV/V + 1.2 µV	780 µV/V + 1.2 µV	780 µV/V
(10 to 20) Hz	0.012 % + 1.2 µV	60 µV/V + 1.2 µV	50 µV/V	40 µV/V
(20 to 40) Hz	93 µV/V + 1.2 µV	50 µV/V + 1.2 µV		
40 Hz to 20 kHz	50 µV/V + 1.2 µV	29 µV/V + 1.2 µV	24 µV/V + 1.2 µV	17 µV/V
(20 to 50) kHz	80 µV/V + 1.6 µV	50 µV/V + 1.6 µV	39 µV/V + 1.6 µV	30 µV/V
(50 to 100) kHz	0.014 % + 1.9 µV	90 µV/V + 1.9 µV	61 µV/V + 1.9 µV	
(100 to 300) kHz	0.029 % + 3.1 µV	0.014 % + 3.1 µV	120 µV/V + 3.1 µV	0.01 %
(300 to 500) kHz	0.038 % + 4.7 µV	0.013 % + 4.7 µV	0.017 %	
(0.5 to 1) MHz	0.051 % + 4.7 µV	0.031 % + 4.7 µV	0.023 %	0.011 %
Comments	Fluke 792A or Fluke 5790A transfer standard for Calibration of Long scale DMM calibration stations, 55XX and 57XX calibrators			

(Continued, 2 of 2)
AC Voltage Measure

Frequency	AC Voltage (±) CMC[2, 4, 5, 6, 7]		
	(2.2 to 7) V	(7 to 22) V	(22 to 70) V
(9.5 to 10) Hz	780 µV/V	780 µV/V	780 µV/V
(10 to 20) Hz	40 µV/V	90 µV/V	40 µV/V
(20 to 40) Hz		40 µV/V	
40 Hz to 20 kHz	17 µV/V	19 µV/V	23 µV/V
(20 to 50) kHz	30 µV/V	30 µV/V	40 µV/V
(50 to 100) kHz			
(100 to 300) kHz	0.01 %	80 µV/V	0.01 %
(300 to 500) kHz			310 µV/V
(0.5 to 1) MHz	0.011 %	0.011 %	850 µV/V
Comments	Fluke 792A or Fluke 5790A transfer standard for Calibration of Long scale DMM calibration stations, 55XX and 57XX calibrators		

Frequency	AC Voltage (±) CMC[2, 4, 5, 6, 7]		
	(70 to 220) V	(220 to 700) V	(700 to 1050) V
(10 to 20) Hz	90 µV/V	0.010 %	90 µV/V
(20 to 40) Hz	50 µV/V	60 µV/V	50 µV/V
40 Hz to 20 kHz	22 µV/V	30 µV/V	29 µV/V
(20 to 50) kHz	40 µV/V	37 µV/V	40 µV/V
(50 to 100) kHz	50 µV/V	60 µV/V	60 µV/V
(100 to 300) kHz	0.011 %		
(300 to 500) kHz	340 µV/V		
Comments	Fluke 792A or Fluke 5790A transfer standard for Calibration of Long scale DMM calibration stations, 55XX and 57XX calibrators		

AC Voltage Measure (Non-Sinusoidal Waveforms)			
Frequency	**AC Voltage (±) CMC**[2, 4, 5, 6, 7]		
	(1 to 22) mV	(22 to 700) mV	(0.7 to 70) V
(10 to 45) Hz	780 µV/V + 1.0 µV	780 µV/V + 1.2 µV	780 µV/V
45 Hz to 1 kHz	780 µV/V + 1.0 µV	780 µV/V + 1.2 µV	780 µV/V
(1 to 20) kHz	0.13 % + 1.0 µV	0.13 % + 1.2 µV	0.13 %
(20 to 100) kHz	0.39 % + 1.9 µV		0.39 %
Comments	5790B AC Measurement Standard for Calibration of 55XX calibrators		

(Table 1 of 2)
AC Voltage Measure (*Fixed Points*)

Frequency	**AC Voltage (±) CMC**[2, 4, 5, 6, 7]					
	0.25 V	1.5 V	2.4 V	10 V	23 V	45 V
0 Hz	33	32	32	32	32	31
16 Hz	26	25	28	23	23	21
40 Hz	25		24	22	22	20
50 Hz					23	21
60 Hz					22	20
120 Hz						
180 Hz						
450 Hz	23	22				
850 Hz	26	25	27	25	25	23
1.2 kHz	36	35	35	34	34	33
1.8 kHz						
2.4 kHz						
3.0 kHz						
3.6 kHz						
4.2 kHz						
4.8 kHz						
5.4 kHz						
6.0 kHz						
Comments	Note: All uncertainties in µV/V					
	Fluke 61XX calibration system					

(Continued, 2 of 2)
AC Voltage Measure (*Fixed Points*)

Frequency	**AC Voltage (±) CMC**[2, 4, 5, 6, 7]				
	90 V Range Linearity				
	7 V	90 V	180 V	360V	1008 V
0 Hz	31	31	31	32	32
16 Hz	54	23	26	28	28
40 Hz		22	22	24	24
50 Hz					
60 Hz					
120 Hz					
180 Hz					
450 Hz					
850 Hz	55	25	25	27	27
1.2 kHz	58	34	34	35	35
1.8 kHz	68				
2.4 kHz					
3.0 kHz	79				
3.6 kHz					
4.2 kHz					
4.8 kHz					
5.4 kHz					
6.0 kHz					
Comments	Note: All uncertainties in μV/V				
	Fluke 61XX calibration system				

(Table 1 of 2)
AC Current Measure (Fixed Points)

Frequency	AC Current (±) CMC[2, 4, 5, 6, 7]							
	20 µA	200 µA	300 µA	2 mA	3 mA	20 mA	200 mA	2 A
10 Hz		80 µA/A	0.010 %	75 µA/A	0.010 %	0.012 %	0.012 %	
20 Hz		65 µA/A		55 µA/A		65 µA/A	65 µA/A	70 µA/A
40 Hz		55 µA/A		45 µA/A		45 µA/A	45 µA/A	
45 Hz			75 µA/A		65 µA/A			
1 kHz	0.015 %	55 µA/A		45 µA/A		45 µA/A	45 µA/A	65 µA/A
5 kHz		0.016 %	0.020 %	75 µA/A	85 µA/A	65 µA/A	65 µA/A	
10 kHz	0.050 %	0.027 %	0.025 %	0.010 %	0.010 %	0.010 %	0.010 %	0.010 %
30 kHz			0.050 %		0.015 %			
Comments	Multifunction Calibrator Calibration							

(Continued, 2 of 2)
AC Current Measure (Fixed Points)

Frequency	AC Current (±) CMC[2, 4, 5, 6, 7, 9]					
	329 µA	0.33 mA	1.9 mA	3.29 mA	3.3 mA	19 mA
10 Hz				170 µA/A		
45 Hz						
1 kHz	99 µA/A	99 µA/A	47 µA/A	42 µA/A	42 µA/A	39 µA/A
5 kHz						
10 kHz	98 µA/A		46 µA/A	41 µA/A		39 µA/A
30 kHz	160 µA/A	160 µA/A	70 µA/A	53 µA/A	53 µA/A	52 µA/A
Comments	A40B with 5790B (Calibration of 55XX calibrators)					

Frequency	AC Current (±) CMC[2, 4, 5, 6, 7, 9]					
	32.9 mA	33 mA	190 mA	329 mA	0.33 A	1.09 A
10 Hz	170 µA/A			170 µA/A		170 µA/A
45 Hz	37 µA/A			39 µA/A		43 µA/A
1 kHz		37 µA/A	41 µA/A	38 µA/A	38 µA/A	
5 kHz	38 µA/A	38 µA/A				
10 kHz			41 µA/A			
30 kHz	50 µA/A	50 µA/A	54 µA/A	51 µA/A		
Comments	A40B with 5790B (Calibration of 55XX calibrators)					

Frequency	AC Current (±) CMC[2, 4, 5, 6, 7, 9]				
	2.19 A	2.99 A	3.3 A	10.9 A	20 A
10 Hz	170 µA/A	170 µA/A			
45 Hz	51 µA/A	47 µA/A		82 µA/A	48 µA/A
65 Hz				83 µA/A	
500 Hz			52 µA/A	90 µA/A	60 µA/A
1 kHz	56 µA/A	52 µA/A	51 µA/A	89 µA/A	59 µA/A
5 kHz	56 µA/A	53 µA/A	52 µA/A	97 µA/A	71 µA/A
10 kHz					
Comments	A40B with 5790B (Calibration of 55XX calibrators)				

(Table 1 of 2)
AC Current Measure & **AC Current** Measuring Devices

Frequency	**AC Current (±) CMC**[2, 4, 5, 6, 7]				
	(10 to 200) µA	(0.2 to 2) mA	(2 to 20) mA	(20 to 200) mA	(0.2 to 2) A
10 Hz	75 µA/A + 5.4 nA	86 µA/A + 21 nA	80 µA/A + 0.21 µA	63 µA/A + 2.1 µA	70 µA/A + 20.6 µA
(10 to 20) Hz	78 µA/A + 5.4 nA	50 µA/A + 21 nA	58 µA/A + 0.21 µA	58 µA/A + 2.1 µA	61 µA/A + 20.6 µA
(20 to 30) Hz			62 µA/A + 0.21 µA	63 µA/A + 2.1 µA	68 µA/A + 20.6 µA
(30 to 40) Hz	74 µA/A + 5.4 nA		53 µA/A + 0.21 µA	52 µA/A + 2.1 µA	55 µA/A + 20.6 µA
(40 to 55) Hz			57 µA/A + 0.21 µA	58 µA/A + 2.1 µA	62 µA/A + 20.6 µA
(55 to 300) Hz	87 µA/A + 5.4 nA	51 µA/A + 21 nA	58 µA/A + 0.21 µA	57 µA/A + 2.1 µA	63 µA/A + 20.6 µA
(0.3 to 1) kHz	78 µA/A + 5.4 nA		53 µA/A + 0.21 µA	52 µA/A + 2.1 µA	55 µA/A + 20.6 µA
(1 to 5) kHz	0.012 % + 5.4 nA	76 µA/A + 21 nA	82 µA/A + 0.21 µA	78 µA/A + 2.1 µA	82 µA/A + 20.6 µA
(5 to 10) kHz	0.031 % + 5.4 nA	0.020 % + 21 nA	0.021 % + 0.21 µA	0.020 % + 2.1 µA	0.022 % + 20.6 µA
(10 to 20) kHz	0.034 % + 7.1 nA	0.031 % + 51 nA	0.032 % + 0.51 µA	0.032 % + 5.0 µA	0.032 % + 50.2 µA
(20 to 30) kHz	0.053 % + 12 nA	0.051 % + 0.10 µA	0.051 % + 1.1 µA	0.051 % + 10 µA	0.052 % + 100 µA
Comments	A40/A40A with a 792A or 5790A (Calibration of 55XX & 57XX calibrators)				

Frequency	**AC Current (±) CMC**[2, 4, 5, 6, 7]
	(2 to 20) A
(1 to 5) kHz	0.031 % + 0.21 mA
(5 to 10) kHz	0.061 % + 0.21 mA
(10 to 20) kHz	0.11 % + 0.51 mA
Comments	A40/A40A with a 792A or 5790A (Calibration of 55XX & 57XX calibrators)

(Continued, 2 of 2) **AC Current** Measure & **AC Current** Measuring Devices			
Frequency	**AC Current**	**(±) CMC[2, 4, 5, 6, 7]**	**Comments**
(40 to 1000) Hz	(2 to 11) A	0.060 % + 0.17 mA	Fluke 5725A
(45 to 100) Hz	(11 to 20) A	0.080 % + 5.0 mA	Fluke 5520A
(100 to 1000) Hz		0.11 % + 5.0 mA	
(16 to 450) Hz	(80 to 120) A	49 µA/A	Fluke 52120A transconductance amplifier w/ Fluke 61XX calibration system
850 Hz		51 µA/A	
(1 to 6) kHz		0.011 %	
Comments	(Calibration of 52120A, 55XX, 57XX & 61XX calibrators)		

AC Current measuring devices (*Fixed Points*)						
Frequency	**AC Current (±) CMC[2, 4, 5, 6]**					
	100 µA	1 mA	10 mA	100 mA	1 A	10 A
55 Hz	60 µA/A	40 µA/A	40 µA/A	40 µA/A	50 µA/A	160 µA/A
300 Hz			50 µA/A			120 µA/A
1 kHz		45 µA/A	35 µA/A	30 µA/A	40 µA/A	90 µA/A
5 kHz	75 µA/A	50 µA/A	40 µA/A	40 µA/A	80 µA/A	0.055 %
10 kHz	200 µA/A	95 µA/A	120 µA/A	110 µA/A	0.052 %	0.070 %
Comments	Calibration of reference multimeters					

(Table, 1 of 4)
AC Current Measure (*Fixed Points*)

Frequency	**AC Current (±) CMC**[2, 4, 5, 6, 7]				
	0.1 A	0.5 A	1 A	2 A	5 A
0 Hz	26	27	27	26	28
16 Hz	27			27	32
40 Hz					
50 Hz					
60 Hz					
120 Hz					
180 Hz					
450 Hz	25	25	25	24	30
850 Hz	27	27	27	27	32
1.2 kHz	28	29	29	28	34
1.8 kHz					
2.4 kHz					
3.0 kHz					
3.6 kHz					
4.2 kHz					
4.8 kHz					
5.4 kHz					
6.0 kHz					
Comments	Note: All uncertainties in µA/A				
	Fluke 61XX calibration system				

(Continued, 2 of 4)
AC Current Measure (*Fixed Points*)

Frequency	**AC Current (±) CMC**[2, 4, 5, 6, 7]				
	10 A Range Linearity				
	0.5 A	10 A	20 A	50 A	100 A
0 Hz	42	28	28	27	33
16 Hz	45	34	34	34	38
40 Hz					
50 Hz					
60 Hz					
120 Hz	78	35	41	50	61
180 Hz					
450 Hz	46	34	40	48	60
850 Hz	47	35	41	50	61
1.2 kHz	48	37	42		62
1.8 kHz			51	59	80
2.4 kHz					
3.0 kHz					
3.6 kHz					
4.2 kHz					
4.8 kHz					
5.4 kHz					
6.0 kHz					
Comments	Note: All uncertainties in µA/A				
	Fluke 61XX calibration system				

(Continued, 3 of 4)
AC Current Measure (*Fixed Points*)

Frequency	AC Current (±) CMC[2, 4, 5, 6, 7]				
	(5 to 10) mA[8]	(10 to 20) mA	(20 to 30) mA	(30 to 50) mA	(50 to 100)[8] mA
10 Hz	0.013 %	0.013 %	0.015 %	0.017 %	0.014 %
20 Hz		75 µA/A			
40 Hz	75 µA/A	60 µA/A	95 µA/A	0.010 %	85 µA/A
400 Hz					
1 kHz					
5 kHz		75 µA/A			
10 kHz					
20 kHz					
30 kHz	90 µA/A	90 µA/A	0.012 %	0.011 %	0.01 %
Comments	Fluke 792 AC/DC transfer standard and a Fluke A40 AC/DC current shunt				

Frequency	AC Current (±) CMC[2, 4, 5, 6, 7]				
	(100 to 200) mA[8]	(200 to 300) mA	(300 to 500) mA	(0.5 to 1) A	(1 to 2) A
10 Hz	0.013 %	0.015 %	0.016 %	0.015 %	0.012 %
20 Hz					0.011 %
40 Hz	80 µA/A	90 µA/A	0.010 %	90 µA/A	
400 Hz					
1 kHz					
5 kHz					
10 kHz					0.012 %
20 kHz		0.015 %			
30 kHz	95 µA/A		0.012 %		
Comments	Fluke 792 AC/DC transfer standard and a Fluke A40 AC/DC current shunt				

(Continued, 4 of 4) **AC Current** Measure (*Fixed Points*)				
Frequency	**AC Current (±) CMC[2, 4, 5, 6, 7]**			
	(2 to 3) A	(3 to 5) A	(5 to 10) A	(10 to 20 A)
10 Hz	0.015 %	0.018 %	0.015 %	0.017 %
20 Hz				
40 Hz	0.010 %	0.011 %		
400 Hz				0.013 %
1 kHz				
5 kHz				0.016 %
10 kHz				
Comments	Fluke 792 AC/DC transfer standard and a Fluke A40 AC/DC current shunt			

(Table, 1 of 2) **AC Current** Measure (Fixed Points)				
Frequency	**2 Amp Range (±) CMC[2, 4, 5, 6, 7]**			
	V in		I in	
	0.4 A	1.0 A	2.0 A	2.0 A
DC	49 µA/A	31 µA/A	24 µA/A	26 µA/A
(10, 16, 40, 50, 60, 120, 180, 450, 850, 1000) Hz	69 µA/A	43 µA/A	28 µA/A	30 µA/A
(1.2, 1.8, 2.4, 3.0, 3.6, 4.2, 4.8, 5.4, 6.0) kHz				
(8.0, 10) kHz	73 µA/A	49 µA/A	37 µA/A	39 µA/A
Comments	61XX calibration station Fluke 52120A (Stand Alone Mode) Calibration			

(Continued, 2 of 2)
AC Current Measure (Fixed Points)

Frequency	**20 Amp Range (±) CMC**[2, 4, 5, 6, 7]			
	V in		I in	
	4 A	10 A	20 A	20 A
DC	72 µA/A	72 µA/A	72 µA/A	72 µA/A
10 Hz	56 µA/A	56 µA/A	46 µA/A	47 µA/A
(16, 40, 50, 60, 120, 180, 450, 850, 1000) Hz	54 µA/A	54 µA/A	43 µA/A	45 µA/A
(1.2, 1.8, 2.4, 3.0, 3.6, 4.2, 4.8, 5.4, 6.0) kHz	61 µA/A	61 µA/A	51 µA/A	53 µA/A
(8.0, 10) kHz	65 µA/A	65 µA/A	56 µA/A	57 µA/A
Comments	61XX calibration station Fluke 52120A (Stand Alone Mode) Calibration			

Frequency	**120 Amp Range (±) CMC**[2, 4, 5, 6, 7]			
	V in		I in	
	20 A	60 A	120 A	120 A
DC	34 µA/A	34 µA/A	34 µA/A	35 µA/A
(10, 16, 40, 50, 60, 120, 180, 450, 850, 1000) Hz	71 µA/A	71 µA/A	71 µA/A	64 µA/A
(1.2, 1.8, 2.4, 3.0, 3.6, 4.2, 4.8, 5.4, 6.0) kHz				
(8.0, 10) kHz	88 µA/A	88 µA/A	88 µA/A	82 µA/A
Comments	61XX calibration station Fluke 52120A (Stand Alone Mode) Calibration			

(Table, 1 of 2) **AC Current** Measure (Fixed Points)			
Frequency	**2 Amp Range (±) CMC[2, 4, 5, 6, 7]**		
	0.4 A	1.0 A	2.0 A
DC	59 µA/A	47 µA/A	43 µA/A
(16, 40, 50, 60, 120, 180, 450, 850, 1000) Hz	75 µA/A	53 µA/A	41 µA/A
(1.2, 1.8, 2.4, 3.0) kHz			42 µA/A
3.6, 4.2, 4.8, 5.4, 6.0) kHz	78 µA/A	57 µA/A	47 µA/A
Comments	61XX calibration station Fluke 52120A calibration (Under 6105A Control)		

Frequency	**20 Amp Range (±) CMC[2, 4, 5, 6, 7]**		
	4 A	10 A	20 A
DC	78 µA/A	78 µA/A	78 µA/A
(16, 40, 50, 60, 120, 180, 450) Hz	62 µA/A	62 µA/A	52 µA/A
(850, 1000) Hz			53 µA/A
(1.2, 1.8, 2.4, 3.0) kHz	68 µA/A	68 µA/A	60 µA/A
(3.6, 4.2, 4.8, 5.4, 6.0) kHz	72 µA/A	72 µA/A	64 µA/A
Comments	61XX calibration station Fluke 52120A calibration (Under 6105A Control)		

(Continued, 2 of 2) **AC Current** Measure (Fixed Points)			
Frequency	**120 Amp Range (±) CMC[2, 4, 5, 6, 7]**		
	20 A	60 A	120 A
DC	49 µA/A	50 µA/A	49 µA/A
(16, 40, 50, 60, 120, 180, 450, 850, 1000) Hz	77 µA/A	75 µA/A	70 µA/A
(1.2, 1.8, 2.4, 3.0) kHz	93 µA/A	91 µA/A	87 µA/A
3.6, 4.2, 4.8, 5.4, 6.0) kHz	96 µA/A	94 µA/A	90 µA/A
Comments	61XX calibration station Fluke 52120A calibration (Under 6105A Control)		

AC Current Phase Measure (*Fixed Points*)	
Frequency	**All Ranges: 2 A, 20 A & 120 A (±) CMC[2, 4, 5, 6, 7]**
16 Hz	1.3 m°
40 Hz	1.8 m°
50 Hz	2.1 m°
60 Hz	2.5 m°
120 Hz	4.3 m°
180 Hz	6.4 m°
450 Hz	16 m°
850 Hz	30 m°
1.0 kHz	34 m°
1.2 kHz	57 m°
1.8 kHz	120 m°
2.4 kHz	130 m°
3.0 kHz	130 m°
3.6 kHz	150 m°
4.2 kHz	180 m°
4.8 kHz	220 m°
5.4 kHz	210 m°
6.0 kHz	240 m°
Comments	61XX calibration station Fluke 52120A calibration (Under 6105A Control)

(Table 1 of 6)
AC Current Phase Measure (*Fixed Points*)

Frequency	**2 Amp Range (±) CMC**[2, 4, 5, 6, 7]		
	0.4 A	1.0 A	2.0 A
16 Hz	1.2	1.2	1.2
40 Hz	1.7	1.7	1.7
50 Hz	2.0	2.0	2.0
60 Hz	2.4	2.4	2.4
120 Hz	4.2	4.2	4.2
180 Hz	6.3	6.3	6.3
450 Hz	16	16	16
850 Hz	30	30	30
1.0 kHz	34	34	34
1.2 kHz	57	57	57
1.8 kHz	120	120	120
2.4 kHz	130	130	130
3.0 kHz	130	130	130
3.6 kHz	150	150	150
4.2 kHz	180	180	180
4.8 kHz	220	220	220
5.4 kHz	210	210	210
6.0 kHz	240	240	240
Comments	All uncertainties are in m°		
	Phase measurement uncertainty assuming a common 61xx and 52120A calibration system. Calibration of 61XX		

(Continued, 2 of 6)
AC Current Phase Measure (*Fixed Points*)

Frequency	**20 Amp Range (±) CMC**[2, 4, 5, 6, 7]		
	4 A	10 A	20 A
16 Hz	1.2	1.2	1.2
40 Hz	1.7	1.7	1.7
50 Hz	2.0	2.0	2.0
60 Hz	2.4	2.4	2.4
120 Hz	4.2	4.2	4.2
180 Hz	6.3	6.3	6.3
450 Hz	16	16	16
850 Hz	29	29	29
1.0 kHz	34	34	34
1.2 kHz	57	57	57
1.8 kHz	120	120	120
2.4 kHz	130	130	130
3.0 kHz	130	130	130
3.6 kHz	150	150	150
4.2 kHz	180	180	180
4.8 kHz	220	220	220
5.4 kHz	210	210	210
6.0 kHz	240	240	240
Comments	All uncertainties are in m°		
	Phase measurement uncertainty assuming a common 61xx and 52120A calibration system. Calibration of 61XX		

(Continued, 3 of 6)
AC Current Phase Measure (*Fixed Points*)

Frequency	**120 Amp Range (±) CMC**[2, 4, 5, 6, 7]		
	20 A	60 A	120 A
16 Hz	1.3	1.3	1.3
40 Hz	1.8	1.8	1.8
50 Hz	2.1	2.1	2.1
60 Hz	2.5	2.5	2.5
120 Hz	4.3	4.3	4.3
180 Hz	6.4	6.4	6.4
450 Hz	16	16	16
850 Hz	30	30	30
1.0 kHz	34	34	34
1.2 kHz	57	57	57
1.8 kHz	120	120	120
2.4 kHz	130	130	130
3.0 kHz	130	130	130
3.6 kHz	150	150	150
4.2 kHz	180	180	180
4.8 kHz	220	220	220
5.4 kHz	210	210	210
6.0 kHz	240	240	240
Comments	All uncertainties are in m°		
	Phase measurement uncertainty assuming a common 61xx and 52120A calibration system. Calibration of 61XX		

(Continued, 4 of 6) **AC Current Phase** Measure (*Fixed Points*)			
Frequency	**2 Amp Range (±) CMC**[2, 4, 5, 6, 7]		
	0.4 A	1.0 A	2.0 A
16 Hz	1.4	1.4	1.4
40 Hz	2.5	2.5	2.5
50 Hz	3.1	3.1	3.1
60 Hz	3.7	3.7	3.7
120 Hz	6.9	6.9	6.9
180 Hz	11	11	11
450 Hz	26	26	26
850 Hz	49	49	49
1.0 kHz	57	57	57
1.2 kHz	78	78	78
1.8 kHz	140	140	140
2.4 kHz	170	170	170
3.0 kHz	190	190	190
3.6 kHz	230	230	230
4.2 kHz	260	260	260
4.8 kHz	310	310	310
5.4 kHz	330	330	330
6.0 kHz	360	360	360
Comments	All uncertainties are in m°		
	Phase measurement uncertainty when the 6105A is calibrated on a separate system.		

(Continued, 5 of 6)
AC Current Phase Measure (*Fixed Points*)

Frequency	**20 Amp Range (±) CMC**[2, 4, 5, 6, 7]		
	4 A	10 A	20 A
16 Hz	1.4	1.4	1.4
40 Hz	2.5	2.5	2.5
50 Hz	3.1	3.1	3.1
60 Hz	3.7	3.7	3.7
120 Hz	6.9	6.9	6.9
180 Hz	11	11	11
450 Hz	26	26	26
850 Hz	49	49	49
1.0 kHz	57	57	57
1.2 kHz	78	78	78
1.8 kHz	140	140	140
2.4 kHz	170	170	170
3.0 kHz	190	190	190
3.6 kHz	230	230	230
4.2 kHz	260	260	260
4.8 kHz	310	310	310
5.4 kHz	330	330	330
6.0 kHz	360	360	360
Comments	All uncertainties are in m°		
	Phase measurement uncertainty when the 6105A is calibrated on a separate system.		

(Continued, 6 of 6)
AC Current Phase Measure (*Fixed Points*)

Frequency	**120 Amp Range (±) CMC**[2, 4, 5, 6, 7]		
	20 A	60 A	120 A
16 Hz	1.5	1.5	1.5
40 Hz	2.5	2.5	2.5
50 Hz	3.1	3.1	3.1
60 Hz	3.7	3.7	3.7
120 Hz	6.9	6.9	6.9
180 Hz	11	11	11
450 Hz	27	27	27
850 Hz	49	49	49
1.0 kHz	57	57	57
1.2 kHz	78	78	78
1.8 kHz	140	140	140
2.4 kHz	170	170	170
3.0 kHz	190	190	190
3.6 kHz	230	230	230
4.2 kHz	260	260	260
4.8 kHz	310	310	310
5.4 kHz	330	330	330
6.0 kHz	360	360	360
Comments	All uncertainties are in m°		
	Phase measurement uncertainty when the 6105A is calibrated on a separate system.		

Effective Current Transfer Ratio			
Parameter	**Frequency**	**(±) CMC[2, 14]**	**Comments**
25 Turn Coils	(50 to 400) Hz	0.085 % of ratio	1000 A max simulated current
50 Turn Coils		0.28 % of ratio	6000 A max simulated current
DC		0.25 % of ratio	Calibration of 5500 coils @ DC
Comments	Calibration of Fluke 5500A/coil, 52120A/Coil 3KA & 6KA current coils		

AC Current Clamp Meters (±) CMC[2, 3, 4, 14]			
Clamp Type: Toroidal			
AC Current	**Frequency**		
	(45 to 65) Hz	(65 to 100) Hz	(100 to 440) Hz
(10 to 16.5) A	0.22 % + 2.8 mA	0.61 % + 2.8 mA	0.63 % + 4.5 mA
(16.5 to 150) A	0.23 % + 21 mA	0.62 % + 22 mA	0.64 % + 44 mA
(150 to 1025) A	0.23 % + 100 mA	0.62 % + 110 mA	0.87 % + 210 mA

Clamp Type: Non-Toroidal			
AC Current	**Frequency**		
	(45 to 65) Hz	(65 to 100) Hz	(100 to 440) Hz
(10 to 16.5) A	0.44 % + 23 mA	0.78 % + 23 mA	0.79 % + 24 mA
(16.5 to 150) A	0.44 % + 190 mA	0.78 % + 190 mA	0.80 % + 200 mA
(150 to 1025) A	0.44 % + 700 mA	0.78 % + 700 mA	0.99 % + 720 mA
Comments	Fluke 5522A, Fluke 5500A/Coil, and Fluke 8846A		

AC Voltage Flatness Measure					
Frequency	**AC Voltage Flatness (±) CMC[2, 4, 5, 6, 7]**				
	5 mV	9.9 mV	10 mV	(34, 39, 40) mV	(99, 100, 340, 399, 400) mV
(50 to 400) MHz	1.0 %	0.80 %	0.80 %	0.80 %	0.70 %
(400 to 500) MHz			0.90 %		
(500 to 900) MHz		0.90 %			
(0.9 to 1) GHz	1.1 %			0.90 %	
(1 to 1.1) GHz					0.80 %
(1.1 to 1.2) GHz	1.2 %	1.0 %			
(1.2 to 1.5) GHz			1.0 %	1.0 %	0.90 %
(1.5 to 1.6) GHz	1.3 %				
(1.6 to 2.0) GHz		1.2 %	1.2 %	1.2 %	1.0 %
(2.0 to 2.1) GHz	1.4 %		1.3 %	1.3 %	
Comments	Agilent EPM 441 power meter and power sensors calibration of Fluke 55XX, 58XX and 9500 scope calibrators				

Frequency	**AC Voltage Flatness (±) CMC[2, 4, 5, 6, 7]**		
	1.2 V	(1.3, 3.4) V	5.5 V
(50 to 100) MHz	0.60 %	0.85 %	0.85 %
(100 to 200) MHz		0.75 %	0.75 %
(200 to 300) MHz	0.65 %		0.70 %
(300 to 400) MHz			0.75 %
(400 to 600) MHz	0.70 %	0.70 %	0.70 %
(0.6 to 1.1) GHz			
(1.1 to 1.2) GHz		1.0 %	
(1.2 to 1.6) GHz	0.95 %		
(1.6 to 2.1) GHz	1.0 %		
Comments	Agilent EPM 441 power meter and power sensors calibration of Fluke 55XX, 58XX and 9500 scope calibrators		

Frequency	AC Voltage Flatness (±) CMC[2, 4, 5, 6, 7]	
	(5 to 10) mV	10 mV to 5.5 V
50 kHz to 10 MHz	0.20 %	0.10 %
Comments	Fluke 5790 AC standard calibration of Fluke 55XX, 57XX calibrators	

(Table 1 of 2)
AC Voltage Flatness Measuring Devices and
AC Voltage Flatness Measure

Frequency	AC Voltage Flatness (±) CMC[2, 4, 5, 6, 7]			
	(1 to 2.2) mV	(2.2 to 7) mV	(7 to 22) mV	(22 to 70) mV
(10 to 50) Hz	0.038 %	0.026 %	0.022 %	0.021 %
50 Hz to 100 kHz	0.021 %	0.012 %	0.010 %	0.009 %
(100 to 500) kHz	0.30 %	0.016 %	0.015 %	0.015 %
(500 to 700) kHz		0.020%	0.018 %	
700 kHz to 1 MHz				0.017 %
(1 to 2) MHz			0.019 %	0.018 %
(2 to 4) MHz	0.050 %	0.033 %	0.030 %	0.027 %
(4 to 6) MHz			0.035 %	0.029 %
(6 to 8) MHz		0.040 %		0.035 %
(8 to 9) MHz			0.036 %	
(9 to 10) MHz			0.040 %	
(10 to 12) MHz	0.065 %	0.055 %	0.050 %	0.047 %
(12 to 15) MHz			0.052 %	0.050 %
(15 to 17) MHz	0.080 %	0.062 %	0.060 %	0.055 %
(17 to 20) MHz		0.070 %	0.065 %	0.060 %
(20 to 23) MHz	0.13 %	0.10 %	0.090 %	0.090 %
(23 to 26) MHz		0.11 %	0.11 %	0.11 %
(26 to 28) MHz	0.15 %	0.13 %	0.12 %	0.12 %
(28 to 30) MHz		0.14 %	0.13 %	0.13 %
Comments	Fluke 5720A, relative to a reference frequency calibration of Fluke 55XX, 57XX calibrators			

(Continued, 2 of 2)
AC Voltage Flatness Measuring Devices and
AC Voltage Flatness Measure

Frequency	**AC Voltage Flatness (±) CMC**[2, 4, 5, 6, 7]			
	(70 to 220) mV	(220 to 700) mV	(0.7 to 2.2) V	(2.2 to 7) V
(10 to 50) Hz	0.020 %	0.016 %	0.016 %	0.015 %
50 Hz to 100 kHz	0.009 %	0.0080 %	0.0075 %	0.0070 %
(100 to 500) kHz	0.014 %	0.014 %	0.013 %	0.013 %
(500 to 700) kHz	0.017 %	0.016 %	0.016 %	0.017 %
700 kHz to 1 MHz				
(1 to 2) MHz		0.017 %	0.017 %	
(2 to 4) MHz	0.025 %	0.024 %	0.023 %	0.025 %
(4 to 6) MHz	0.027 %	0.026 %	0.026 %	
(6 to 8) MHz	0.031 %	0.030 %	0.028 %	0.028 %
(8 to 9) MHz	0.032 %			
(9 to 10) MHz			0.030 %	0.030 %
(10 to 12) MHz	0.045 %	0.042 %	0.040 %	0.040 %
(12 to 15) MHz	0.046 %	0.045 %	0.045 %	0.045 %
(15 to 17) MHz	0.055 %	0.050 %	0.050 %	0.050 %
(17 to 20) MHz	0.060 %	0.060 %	0.060 %	0.060 %
(20 to 23) MHz	0.090 %	0.09 %	0.090 %	0.090 %
(23 to 26) MHz	0.10 %	0.10 %	0.10 %	0.10 %
(26 to 28) MHz	0.11 %	0.11 %	0.11 %	0.11 %
(28 to 30) MHz	0.12 %	0.12 %	0.12 %	0.13 %
Comments	Fluke 5720A, relative to a reference frequency calibration of Fluke 55XX, 57XX calibrators			

CAPACITANCE			
Capacitance Measure			
Capacitance	**Frequency**	**(±) CMC[2, 4, 6, 7, 14]**	**Comments**
(1 to 1000) nF	1 kHz	25 µF/F	Andeen Hagerling 2500A option E
Capacitance Measuring Devices			
Capacitance	**Frequency**	**(±) CMC [2, 4, 5, 6, 7]**	**Comments**
(0.19 to 0.3999) nF	10 Hz to 10 kHz	0.29 % + 7.8 pF	Fluke 5520A
(0.4 to 1.0999) nF			
(1.1 to 3.2999) nF	10 Hz to 3 kHz		
(3.3 to 10.9999) nF	10 Hz to 1 kHz	0.15 % + 7.8 pF	
(11 to 32.9999) nF		0.15 % + 78 pF	
(33 to 109.999) nF			
(110 to 329.999) nF		0.15 % + 230 pF	
330 nF to 1.09 999 µF	(10 to 600) Hz	0.15 % + 780 pF	
(1.1 to 3.29 999) µF	(10 to 300) Hz		
(3.3 to 10.9999) µF	(10 to 150) Hz		
(11 to 32.9999) µF	(10 to 120) Hz	0.23 % + 23 nF	
(33 to 109.999) µF	(10 to 80) Hz	0.26 % + 0.78 µF	
(110 to 329.999) µF	(0 to 50) Hz	0.26 % + 0.23 µF	
330 µF to 1.09999 mF	(0 to 20) Hz	0.26 % + 0.78 µF	
(1.1 to 3.2999) mF	(0 to 6) Hz	0.26 % + 2.3 µF	
(3.3 to 10.9999) mF	(0 to 2) Hz	0.26 % + 7.8 µF	
(11 to 32.9999) mF	(0 to 0.6) Hz	0.54 % + 23 µF	
(33 to 110) mF	(0 to 0.2) Hz	0.78 % + 78 µF	

Capacitance Measure on Fluke 55XX Series Calibrators (*Fixed Points*)		
Range	**(±) CMC**[2, 4, 6, 7, 14]	**Comments**
0.33 mF	0.18 %	Charge technique using a DC current source and a long scale voltmeter
0.8 mF	0.080 %	
1.0 mF	0.067 %	
1.2 mF	0.060 %	
3 mF	0.035 %	
3.3 mF	0.050 %	
8 mF	0.050 %	
10 mF	0.050 %	
12 mF	0.050 %	
30 mF	0.020 %	
33 mF	0.050 %	
80 mF	0.030 %	
100 mF	0.020 %	

(Table 1 of 2) **Capacitance** Measure on Fluke 55XX Series Calibrators		
Capacitance	**(±) CMC**[2, 4, 5, 6, 7, 9]	**Frequency**
(100 to 300) pF	0.70 %	1 kHz
(300 to 600) pF	0.40 %	
(0.6 to 1.0) nF	0.17 %	
(1 to 3.0) nF	0.11 %	
(3 to 10) nF	0.13 %	
(10 to 30) nF	0.060 %	
(30 to 100) nF		
(100 to 300) nF		
(0.3 to 1.0) µF	0.080 %	100 Hz
(1.0 to 3.0) µF	0.060 %	
(3 to 10) µF		
(10 to 30) µF	0.080 %	
(30 to 100) µF	0.11 %	
(100 to 300) µF		
Comments	Fluke PM 6304 RLC meter	

(Continued, 2 of 2) **Capacitance** Measure on Fluke 55XX Series Calibrators		
Capacitance	**(±) CMC[2, 4, 5, 6, 7, 9]**	**Frequency**
3.3 nF	0.13 %	1 kHz
7.0 nF		
33 nF	0.080 %	
70 nF		
0.33 µF	0.080 %	100 Hz
0.70 µF		
3.3 µF		
7.0 µF		
33 µF		
70 µF	0.080 %	50 Hz
109 µF	0.11 %	
200 µF		
300 µF		
330 µF	0.13 %	
1100 µF	0.29 %	
Comments	Fluke PM 6304 RLC meter Calibration of 55XX calibrators	

Capacitance Measure (*Fixed Points*)			
Capacitance	**Frequency**	**(±) CMC[2, 4, 5, 6, 7]**	**Comments**
5 pF	10 MHz	0.18 pF	Fluke 55XX/ Fluke 9500 Calibrators using artifact capacitors
20 pF		0.35 pF	
29 pF			
50 pF		0.70 pF	
20 pF	1 MHz	0.16 pF	
70 pF		0.50 pF	
90 pF			
1.0 pF	100 Hz to 10 MHz	0.035 %	
10 pF		0.015 %	
100 pF			
1000 pF		0.035 %	
(1, 10, 100, 200, 500, 1000) nF	1 kHz	50 µF/F	Standard capacitors

Inductance Measuring Devices			
Fixed Point	**Frequency**	**(±) CMC[2, 4, 6, 7, 14]**	**Comments**
1 mH	1 kHz	0.022 %	General Radio 1482
100 mH	1 kHz	0.022 %	
10 H	400 Hz	0.11 %	
Comments	Calibration of 63XX LCR meters		

(Table 1 of 2)
Electrical Simulation of **Thermocouple Indicators** Measuring Devices and **Thermocouple Indicators** Measure

Thermocouple Type	Range	(±) CMC[2, 4, 5, 6]
Type B	(600 to 800) °C	0.27 °C
	(800 to 1550) °C	0.21 °C
	(1550 to 1820) °C	0.16 °C
Type C	(0 to 1000) °C	0.11 °C
	(1000 to 1800) °C	0.17 °C
	(1800 to 2000) °C	0.18 °C
	(2000 to 2316) °C	0.24 °C
Type E	(-250 to -200) °C	0.18 °C
	(-200 to -100) °C	0.08 °C
	(-100 to 0) °C	0.05 °C
	(0 to 600) °C	0.05 °C
	(600 to 1000) °C	0.06 °C
Type J	(-210 to -100) °C	0.10 °C
	(-100 to 800) °C	0.05 °C
	(800 to 1200) °C	0.06 °C
Type K	(-270 to -200) °C	0.19 °C
	(-200 to -100) °C	0.11 °C
	(-100 to 500) °C	0.06 °C
	(500 to 800) °C	0.07 °C
	(800 to 1372) °C	0.08 °C
Type N	(-270 to -200) °C	0.25 °C
	(-200 to -100) °C	0.17 °C
	(-100 to 0) °C	0.08 °C
	(0 to 100) °C	0.07 °C
	(100 to 800) °C	0.06 °C
	(800 to 1300) °C	0.08 °C
Type R	(-50 to -25) °C	0.41 °C
	(-25 to 0) °C	0.34 °C
	(0 to 100) °C	0.29 °C
	(100 to 400) °C	0.21 °C
	(400 to 600) °C	0.16 °C
	(600 to 1000) °C	0.15 °C
	(1000 to 1600) °C	0.14 °C
	(1600 to 1767) °C	0.16 °C
Comments	Fluke 525B or Fluke 7526A for calibration of handheld thermometers	

(Continued, 2 of 2) Electrical Simulation of **Thermocouple Indicators** Measuring Devices and **Thermocouple Indicators** Measure		
Thermocouple Type	**Temperature Range**	**(±) CMC[2, 4, 5, 6]**
Type S	(-50 to -25) °C (-25 to 0) °C (0 to 100) °C (100 to 400) °C (400 to 600) °C (600 to 1000) °C (1000 to 1600) °C (1600 to 1767) °C	0.39 °C 0.33 °C 0.28 °C 0.21 °C 0.17 °C 0.16 °C 0.15 °C 0.18 °C
Type T	(-270 to -250) °C (-250 to -200) °C (-200 to -100) °C (-100 to 0) °C (0 to 400) °C	0.39 °C 0.26 °C 0.11 °C 0.07 °C 0.05 °C
Type U	(-200 to 0) °C (0 to 200) °C (200 to 600) °C	0.11 °C 0.06 °C 0.05 °C
Comments	Fluke 525B or Fluke 7526A for calibration of handheld thermometers	

Oscilloscopes		
Parameter	**Range**	**(±) CMC[2, 4, 5, 6, 7, 9]**
Square Wave (1 MΩ)	(0.60 to ± 60) V (10 Hz to 10 kHz)	0.075 % + 2.0 mV
Time Mark (50 Ω)	10 nS to 1 S	60 µS/S
Comments	Fluke 5520A/SC1100 & 9500 for calibration of DSA8300	

AC Power Measuring Devices					
Frequency	**Voltage**	**Current (A)**	**Equivalent Power (W)**	**(±) CMC[2, 4, 5, 6, 7, 9] (µW/W)**	
				PF 1.0, 0 °	**PF 0.5, 60 °**
50 Hz & 60 Hz	115 V	0.250	29	35	51
		0.375	43		
		1.5	173		
		3.0	345	39	54
		15.0	1725	41	55
		30.0	3450		
		50.0	5750		
	230 V	0.250	58	36	51
		0.375	86	35	
		1.5	345		
		3.0	690	39	54
		15.0	3450	41	55
		30.0	6900		
		50.0	11 500		
Comments		Fluke 61XX calibration system calibration of 61XX calibrators			

Dips & Swells Measure				
Frequency	**Range**	**Level**	**Interval (s)**	**(±) CMC[2, 4, 5, 6, 7, 9] (µV/V)**
50 Hz & 60 Hz	90 V	7 V	0.5	190
		70 V		35
		90 V		34
		7 V	60	26
		70 V		
		90 V		
	180 V	12 V	0.5	290
		115 V		38
		180 V		
		12 V	60	42
		115 V		22
		180 V		
	360 V	23 V	0.5	290
		230 V		32
		360 V		
		23 V	60	38
		230 V		24
		360 V		
	10 A	0.5 A	0.5	340
		5.0 A		45
		10.0 A		38
		0.5 A	60	220
		5.0 A		
		10.0 A		35
Comments	Fluke 61XX calibration system calibration of 61XX calibrators			

RF Power			
Range	**Frequency**	**(±) CMC[2, 4, 6, 7, 11, 14]**	**Comments**
1 mW	50 MHz	0.15 %	Tegam 1830 power meter w/ HP 478H76 power sensor
Comments	Fluke internal calibration of RF power meter reference output		

Voltage Standing Wave Ratio (VSWR)			
Parameter	**Frequency**	**(±) CMC[2, 4, 7, 14]**	**Comments**
50 Ω	(1 to 10) MHz 10 MHz to 1 GHz (1 to 1.7) GHz (1.7 to 2) GHz (2 to 2.5) GHz (2.5 to 3) GHz (3 to 3.6) GHz (3.6 to 4) GHz	0.037 dB 0.028 dB 0.037 dB 0.047 dB 0.064 dB 0.10 dB 0.18 dB 0.21 dB	86205A/FSU26 (VSWR of 1 to 1.4, source outputs up to +13 dBm)
75 Ω	(1 to 10) MHz 10 MHz to 1 GHz (1 to 1.3) GHz (1.3 to 2) GHz	0.043 dB 0.036 dB 0.041 dB 0.067 dB	86207A/FSU26 (VSWR of 1 to 1.4, source outputs up to +7 dBm)
2.92 mm	(2.5 to 5) GHz (5 to 11) GHz (11 to 20) GHz (20 to 27) GHz	0.26 dB 0.42 dB 0.42 dB 0.65 dB	SC8233/FSU26 (VSWR of 1 to 1.4, source outputs up to +13 dBm)
	(2.5 to 5) GHz (5 to 11) GHz (11 to 20) GHz (20 to 26.5) GHz	0.26 dB 0.42 dB 0.42 dB 0.65 dB	SC8233/FSU26 (VSWR 1.4 to 2.4, source outputs up to +13 dBm)
Comments	Calibration station for Fluke 96XXX series RF reference sources		

(Table 1 of 3)
RF Flatness Measure, **50 Ω Level Sine (±) CMC**[2, 4, 7, 11, 14]

Frequency	AC Voltage Flatness (dBm)					
	(24 to 20)	(20 to 0)	(0 to -10)	(-10 to -20)	(-20 to -30)	(-30 to -40)
1000 Hz	0.0030 dBm	0.0030 dBm	0.0030 dBm	0.0030 dBm	0.0030 dBm	0.0040 dBm
20 kHz						
75 kHz						
100 kHz					0.0040 dBm	0.0050 dBm
300 kHz	0.022 dBm	0.017 dBm	0.026 dBm	0.026 dBm	0.022 dBm	0.022 dBm
1 MHz						
10 MHz						
20 MHz	0.026 dBm	0.022 dBm				
100 MHz					0.026 dBm	0.026 dBm
125 MHz			0.031 dBm	0.031 dBm		0.031 dBm
300 MHz		0.031 dBm			0.031 dBm	
750 MHz						
1 GHz			0.035 dBm	0.035 dBm		
1.4 GHz		0.048 dBm	0.061 dBm	0.061 dBm	0.057 dBm	0.057 dBm
2 GHz			0.066 dBm	0.066 dBm	0.061 dBm	0.061 dBm
2.5 GHz		0.061 dBm	0.092 dBm	0.092 dBm	0.092 dBm	0.092 dBm
3 GHz						
3.5 GHz		0.074 dBm	0.11 dBm	0.11 dBm	0.11 dBm	0.11 dBm
4 GHz			0.12 dBm	0.12 dBm	0.12 dBm	0.12 dBm
Comments	Calibration station for Fluke 96XXX series RF reference sources					

(Continued, 2 of 3)
RF Flatness Measure, **50 Ω Level Sine (±) CMC**[2, 4, 7, 11, 14]

Frequency	**AC Voltage Flatness (dBm)**				
	(-40 to -48)	(-48 to -58)	(-58 to -68)	(-68 to -78)	(-78 to -88)
1000 Hz	0.0040 dBm				
20 kHz		0.024 dBm			
75 kHz					
100 kHz	0.0060 dBm	0.019 dBm	0.035 dBm	0.038 dBm	0.099 dBm
300 kHz	0.026 dBm	0.032 dBm	0.044 dBm	0.040 dBm	0.10 dBm
1 MHz					
10 MHz			0.037 dBm		0.093 dBm
20 MHz					0.063 dBm
100 MHz					
125 MHz	0.031 dBm	0.036 dBm	0.041 dBm	0.043 dBm	0.065 dBm
300 MHz					
750 MHz			0.054 dBm	0.055 dBm	0.069 dBm
1 GHz			0.071 dBm	0.072 dBm	0.094 dBm
1.4 GHz	0.057 dBm	0.061 dBm	0.10 dBm	0.10 dBm	0.13 dBm
2 GHz	0.061 dBm	0.066 dBm	0.13 dBm	0.13 dBm	0.15 dBm
2.5 GHz	0.092 dBm	0.10 dBm	0.15 dBm	0.15 dBm	0.18 dBm
3 GHz			0.18 dBm	0.19 dBm	
3.5 GHz	0.11 dBm	0.12 dBm	0.20 dBm	0.20 dBm	0.20 dBm
4 GHz	0.12 dBm		0.14 dBm		
Comments	Calibration station for Fluke 96XXX series RF reference sources				

(Continued, 3 of 3)
RF Flatness Measure, **50 Ω Level Sine (±) CMC**[2, 4, 7, 11, 14]

Frequency	**AC Voltage Flatness (dBm)**			
	(-88 to -98)	(-98 to -108)	(-108 to -118)	(-118 to -128)
100 kHz	0.14 dBm	0.20 dBm	0.19 dBm	0.46 dBm
300 kHz	0.10 dBm	0.13 dBm		0.47 dBm
1 MHz	0.077 dBm			
10 MHz	0.062 dBm	0.11 dBm	0.17 dBm	0.21 dBm
20 MHz		0.099 dBm	0.16 dBm	
100 MHz				
125 MHz	0.064 dBm	0.10 dBm		0.25 dBm
300 MHz		0.20 dBm	0.39 dBm	0.47 dBm
750 MHz	0.079 dBm		0.40 dBm	
1 GHz	0.096 dBm	0.21 dBm	0.41 dBm	
1.4 GHz	0.12 dBm	0.22 dBm	0.42 dBm	0.49 dBm
2 GHz	0.15 dBm	0.24 dBm	0.43 dBm	
2.5 GHz	0.17 dBm	0.26 dBm	0.44 dBm	
3 GHz	0.20 dBm		0.45 dBm	
3.5 GHz	0.22 dBm	0.30 dBm	0.50 dBm	0.56 dBm
4 GHz	0.21 dBm	0.22 dBm		
Comments	Calibration station for Fluke 96XXX series RF reference sources			

(Table 1 of 3)
RF Flatness Measure**, 75 Ω Level Sine (±) CMC**[2, 4, 7, 11, 14]

Frequency	**AC Voltage Flatness (dBm)**					
	(18 to 11)	(11 to 0)	(0 to -10)	(-10 to -20)	(-20 to -30)	(-30 to -40)
1000 Hz	0.0030 dBm	0.0030 dBm	0.0030 dBm	0.0030 dBm	0.0030 dBm	0.0040 dBm
20 kHz						
75 kHz						
100 kHz					0.0040 dBm	0.0050 dBm
300 kHz	0.064 dBm	0.061 dBm	0.061 dBm	0.061 dBm	0.061 dBm	0.061 dBm
1 MHz	0.055 dBm	0.052 dBm	0.052 dBm	0.052 dBm	0.057 dBm	0.057 dBm
10 MHz						
20 MHz	0.059 dBm	0.057 dBm	0.057 dBm	0.057 dBm		
100 MHz						
125 MHz	0.064 dBm	0.061 dBm	0.061 dBm	0.061 dBm	0.061 dBm	0.061 dBm
300 MHz						
750 MHz	0.077 dBm	0.074 dBm	0.074 dBm	0.074 dBm	0.074 dBm	0.074 dBm
1 GHz	0.087 dBm	0.083 dBm	0.083 dBm	0.083 dBm	0.083 dBm	0.083 dBm
1.4 GHz	0.12 dBm	0.11 dBm	0.11 dBm	0.11 dBm	0.11 dBm	0.11 dBm
2 GHz					0.12 dBm	0.12 dBm
2.5 GHz		0.12 dBm	0.12 dBm	0.12 dBm		
3 GHz						
Comments	Calibration station for Fluke 96XXX series RF reference sources					

(Continued, 2 of 3)
RF Flatness Measure**, 75 Ω Level Sine (±) CMC**[2, 4, 7, 11, 14]

Frequency	**AC Voltage Flatness (dBm)**				
	(-40 to -43)	(-43 to -55)	(-55 to -65)	(-65 to -75)	(-75 to -85)
1000 Hz	0.0050 dBm				
20 kHz		0.048 dBm	0.049 dBm		
75 kHz					
100 kHz				0.050 dBm	0.074 dBm
300 kHz	0.048 dBm	0.076 dBm	0.077 dBm	0.078 dBm	0.094 dBm
1 MHz	0.044 dBm	0.073 dBm	0.074 dBm	0.075 dBm	0.091 dBm
10 MHz					
20 MHz	0.048 dBm				
100 MHz					
125 MHz		0.076 dBm	0.077 dBm	0.078 dBm	0.094 dBm
300 MHz					
750 MHz	0.066 dBm	0.088 dBm	0.089 dBm	0.090 dBm	0.10 dBm
1 GHz	0.074 dBm	0.096 dBm	0.097 dBm	0.098 dBm	0.11 dBm
1.4 GHz	0.11 dBm	0.14 dBm	0.14 dBm	0.14 dBm	0.16 dBm
2 GHz					0.17 dBm
2.5 GHz	0.12 dBm				
3 GHz					
Comments	Calibration station for Fluke 96XXX series RF reference sources				

(Continued, 3 of 3)
RF Flatness Measure**, 75 Ω Level Sine (±) CMC**[2, 4, 7, 11, 14]

Frequency	**AC Voltage Flatness (dBm)**			
	(-85 to -95)	(-95 to -105)	(-105 to -115)	(-115 to -125)
100 kHz	0.076 dBm	0.13 dBm	0.27 dBm	0.27 dBm
300 kHz	0.096 dBm	0.15 dBm		
1 MHz	0.094 dBm	0.14 dBm		
10 MHz				
20 MHz				
100 MHz				
125 MHz	0.096 dBm	0.15 dBm		
300 MHz		0.22 dBm	0.45 dBm	0.45 dBm
750 MHz	0.11 dBm	0.23 dBm		
1 GHz				
1.4 GHz	0.17 dBm	0.25 dBm	0.47 dBm	0.47 dBm
2 GHz				
2.5 GHz				
3 GHz				
Comments	Calibration station for Fluke 96XXX series RF reference sources			

(Table 1 of 4)
RF Flatness Measure, **50 Ω Level Sine,**
2.92 mm Microwave Output (±) CMC[2, 4, 7, 11, 14]

Frequency	**AC Voltage Flatness (dBm)**				
	(24 to 18)	(18 to 0)	(0 to -10)	(-10 to -20)	(-20 to -30)
1 kHz	0.0050 dB	0.0050 dB	0.0050 dB	0.023 dB	0.023 dB
20 kHz					
100 kHz				0.024 dB	0.024 dB
300 kHz	0.094 dB	0.087 dB	0.094 dB	0.095 dB	0.096 dB
1 MHz					
10 MHz					
20 MHz					0.097 dB
100 MHz					0.096 dB
125 MHz	0.099 dB	0.092 dB	0.098 dB	0.099 dB	0.10 dB
300 MHz					
750 MHz	0.11 dB	0.095 dB	0.11 dB	0.11 dB	0.11 dB
1 GHz					
1.4 GHz		0.096 dB			
2 GHz	0.12 dB	0.11 dB	0.12 dB	0.12 dB	0.12 dB
2.5 GHz					
3 GHz				0.11 dB	0.11 dB
3.5 GHz				0.12 dB	0.12 dB
4 GHz					
5 GHz					
6 GHz					
7 GHz	0.14 dB	0.12 dB	0.14 dB	0.14 dB	0.14 dB
8 GHz					
9 GHz					
10 GHz				0.15 dB	0.15 dB
11 GHz					
Comments	Fluke 96270A RF reference source				

(Continued, 2 of 4)
RF Flatness Measure, **50 Ω Level Sine,**
2.92 mm Microwave Output (±) CMC[2, 4, 7, 11, 14]

Frequency	**AC Voltage Flatness (dBm)**				
	(24 to 18)	(18 to 0)	(0 to -10)	(-10 to -20)	(-20 to -30)
12 GHz	0.14 dB	0.12 dB	0.14 dB	0.16 dB	0.16 dB
13 GHz	0.19 dB	0.18 dB	0.2 dB	0.21 dB	0.21 dB
14 GHz					
15 GHz					
16 GHz	0.2 dB			0.22 dB	0.22 dB
17 GHz					
18 GHz			0.21 dB		
19 GHz					0.23 dB
20 GHz				0.23 dB	
21 GHz				0.25 dB	0.25 dB
22 GHz					
23 GHz	0.21 dB	0.19 dB	0.22 dB	0.26 dB	0.26 dB
24 GHz				0.27 dB	0.27 dB
25 GHz			0.23 dB	0.28 dB	0.28 dB
26 GHz	0.22 dB	0.20 dB	0.24 dB		
26.5 GHz					
Comments	Fluke 96270A RF Reference Source				

(Continued, 3 of 4)
RF Flatness Measure, **50 Ω Level Sine,**
2.92 mm Microwave Output (±) CMC[2, 4, 7, 11, 14]

Frequency	**AC Voltage Flatness (dBm)**					
	(-30 to -40)	(-40 to -50)	(-50 to -60)	(-60 to -70)	(-70 to -80)	(-80 to -90)
1 kHz	0.024 dB	0.047 dB				
20 kHz			0.11 dB	0.13 dB	0.16 dB	0.16 dB
100 kHz			0.080 dB	0.082 dB		
300 kHz	0.097 dB	0.11 dB	0.11 dB	0.12 dB	0.13 dB	0.13 dB
1 MHz						
10 MHz						
20 MHz						
100 MHz						
125 MHz	0.10 dB	0.12 dB	0.12 dB			
300 MHz	0.10 dB					
750 MHz	0.11 dB					
1 GHz						0.14 dB
1.4 GHz						
2 GHz	0.12 dB	0.13 dB	0.13 dB	0.13 dB	0.14 dB	
2.5 GHz						0.15 dB
3 GHz						
3.5 GHz						
4 GHz						
5 GHz						
6 GHz	0.13 dB	0.15 dB	0.15 dB	0.14 dB	0.15 dB	
7 GHz	0.14 dB	0.16 dB	0.16 dB	0.16 dB	0.20 dB	0.19 dB
8 GHz						0.20 dB
9 GHz			0.17 dB	0.17 dB		
Comments	Fluke 96270A RF reference source					

(Continued, 4 of 4)
RF Flatness Measure, **50 Ω Level Sine,**
2.92 mm Microwave Output (±) CMC[2, 4, 7, 11, 14]

Frequency	**AC Voltage Flatness (dBm)**					
	(-30 to -40)	(-40 to -50)	(-50 to -60)	(-60 to -70)	(-70 to -80)	(-80 to -90)
10 GHz	0.15 dB	0.17 dB	0.17 dB	0.17 dB	0.20 dB	0.20 dB
11 GHz		0.21 dB	0.21 dB			
12 GHz	0.16 dB			0.18 dB		
13 GHz	0.21 dB	0.25 dB	0.25 dB	0.22 dB	0.24 dB	
14 GHz				0.28 dB		0.24 dB
15 GHz			0.28 dB			
16 GHz	0.22 dB	0.28 dB		0.30 dB	0.27 dB	0.27 dB
17 GHz						
18 GHz		0.46 dB	0.32 dB		0.30 dB	0.30 dB
19 GHz	0.23 dB			0.31 dB	0.31 dB	
20 GHz			0.33 dB	0.54 dB	0.37 dB	0.37 dB
21 GHz	0.25 dB					
22 GHz						
23 GHz	0.26 dB					
24 GHz	0.27 dB		0.44 dB	0.62 dB	0.54 dB	0.54 dB
25 GHz	0.28 dB	0.73 dB	0.49 dB			
26 GHz				0.70 dB	0.91 dB	0.91 dB
26.5 GHz			0.62 dB			
Comments	Fluke 96270A RF reference source					

IV. Mechanical

Parameter	Range	(±) CMC[2, 6, 14]	Comments
Gauge Pressure (Pneumatic) **Nitrogen**	(-100 to 280) kPa	0.0016 % + 0.31 Pa	Fluke PG7601 differential mode
	(0 to <7) kPa (7 to 9) kPa	0.0077 % + 0.55 Pa 0.0090 % + 0.40 Pa	Ruska 7250xi
	(9 to 380) kPa (380 to 720) kPa (720 to 7000) kPa	0.0016 % + 0.060 Pa 0.0017 % + 0.13 Pa 0.0017 % + 1.2 Pa	Fluke PG7601
	(7 to 13.8) MPa	0.0090 % + 0.13 kPa	Ruska 7250xi
Gauge Pressure[10] (Pneumatic) **Air**	(0 to 750) Pa (750 to 2833) Pa (2833 to 7500) Pa	0.0075 % + 53 mPa 0.0090 % + 37 mPa 0.0091 % + 14 mPa	Fluke 7250LP differential
Absolute Pressure (Pneumatic) **Nitrogen**	(0.7 to 9) kPa	0.0077 % + 15 Pa	Ruska 7250xi
	(9 to 380) kPa (380 to 720) kPa (720 to 7000) kPa (7000 to 7100) kPa	0.0016 % + 0.21 Pa 0.0017 % + 0.24 Pa 0.0017 % + 1.2 Pa 0.0017 % + 10 Pa	Fluke PG7601
	(7.1 to 10) MPa	0.010 % but not less than 0.30 kPa	Fluke RPM4
Gauge Pressure (Hydraulic)	(1.4 to 70) MPa	0.013 % but not less than 2.7 kPa	Fluke RPM4
Comments	Calibration station for Fluke pressure meters and transducers		

V. Thermodynamics

Parameter	Range	(±) CMC[2, 14]	Comments
Temperature Measure of **PRTs**	223 K, 303 K 373 K, 430 K (373 to 773) K	10 mK 12 mK 50 mK	Super-thermometer (1595A) /PRT reference thermometer, TPW cell, Ga cell, In cell, dry wells
Temperature Measure of **Thermistors**	(273 to 373) K	8.0 mK	Super-thermometer (1595A) /PRT reference thermometer, TPW cell, Ga cell, liquid baths, dry wells
Temperature Measure of **Temperature** Measuring Devices	213 K 223 K, 233 K 253 K 273 K 303 K 323 K 373 K 430 K 473K, 573 K, 673 K 773 K	16 mK 10 mK 18 mK 4.0 mK 5.0 mK 14 mK 12 mK 6.0 mK 42 mK 46 mK	Super-thermometer (1595A) /PRT reference thermometer, TPW cell, Ga cell, In cell, liquid baths and dry wells
Temperature Measure of **Thermocouples** (Type J, K, T, E)	(295 to 299) K	0.035 K	Superthermometer, SPRT, liquid baths
Comments	Calibration station for Fluke temperature probes and meters		

Infrared Radiation Measure			
Wavelength [λ]	**Range**	**(±) CMC[2, 14]**	**Comments**
(8 to 14) µm	(253 to 573) K	$0.40 \times 10^{-3}\ T_m + 0.10$ K	Raytek Trirat LT
	(573 to 1233) K	$2.1 \times 10^{-3}\ T_m - 0.65$ K	Heitronics TRT II
3.9 µm	(428 to 1233) K	$0.20 \times 10^{-3}\ T_m + 0.65$ K	
1.6 µm	(573 to 1073) K	$2.9 \times 10^{-3}\ T_m + 0.19$ K	Raytek MA1
1.0 µm	(1033 to 2973) K	$1.9 \times 10^{-3}\ T_m + 0.90$ K	Rayrek MA2
where T_m represents the measurement temperature [K] Fluke IR calibration station			

Infrared Radiation Measuring Devices			
Wavelength [λ]	**Range**	**(±) CMC[2, 14]**	**Comments**
(8 to 14) µm	(253 to 573) K	$0.40 \times 10^{-3}\ T_m + 0.12$ K	IR Cavity, Raytek Trirat LT
	(573 to 1233) K	$1.9 \times 10^{-3}\ T_m - 0.35$ K	IR Cavity, Heitronics TRT II
3.9 µm	(428 to 1233) K	$0.80 \times 10^{-3}\ T_m + 0.19$ K	IR Cavity, KT19.41
1.6 µm	(573 to 1073) K	$2.9 \times 10^{-3}\ T_m - 0.19$ K	T-Gauge, Raytek MA2
1.0 µm	(1033 to 2973) K	$1.9 \times 10^{-3}\ T_m - 0.90$ K	T-Gauge, Raytek MA1
where T_m represents the measurement temperature [K] Fluke IR calibration station			

VI. Time & Frequency

Parameter	Range	(±) CMC[2, 14]	Comments
Rise Time Measure and **Rise Time** Measuring Devices (Measure >24 ps)	4 mV to 4 V	7.3 ps	Fast step generator w/ Tektronix 11801 digital sampling oscilloscope
Frequency & Period Measure and **Frequency & Period** Measuring Devices	(1, 5, 10) MHz	0.9 parts in 10^{12} Hz/Hz	GPS through FMAS system from NIST and HP5071
	1 mHz to 1.3 GHz	7.0 parts in 10^{12} Hz/Hz + 6 µHz	GPS based 10 MHz distributed signal and Fluke 6680B counter
	(1.3 to 2.7) GHz	14 µHz	
Comments	Calibration station for Fluke Frequency counters		

VII. Laser Power

Fiber Optic Laser Power			
Wavelength [λ]	**Range**	(±) CMC[2, 6, 14]	**Comments**
(635 to 650) nm	Absolute Power: (700 to 1000 µW)	6.8 %	EXFO FPM-820 with FHM-8705 special
850 nm	Absolute Power: 100 µW	1.8 %	
	Linearity: (0 to -58) dBm	2.4 %	
1310 nm	Absolute Power: 100 µW	2.0 %	
	Linearity: (0 to -58) dBm	2.3 %	
Comments	Special calibration of Fluke FNet calibration station		

Satellite Location
FLUKE CORPORATION
BEAVERTON SERVICE CENTER
13725 Karl Braun Center
Beaverton, OR 97077

I. Electrical – DC/Low Frequency

Parameter	Range	(±) CMC[2, 5, 9]	Comments
DC Voltage Measuring Devices	(-330 to 330) mV ± (0.33 to 3.3) V ± (3.3 to 33) V ± (33 to 330) V ± (100 to 1020) V	11 µV/V + 1.0 µV 5.9 µV/V + 5.7 µV 6.8 µV/V + 47 µV 11 µV/V + 410 µV 11 µV/V + 1.3 mV	Fluke 5522A/ Fluke 8846A Calibration of 280 series multimeters
DC Current Measuring Devices	(-330 to 330 µA ± (0.33 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 to 11) A ± (11 to 20.5) A	93 µA/A + 16 nA 62 µA/A + 39 nA 56 µA/A + 260 nA 61 µA/A + 2.3 µA 0.012 % + 39 µA 0.023 % + 33 µA 0.029 % + 440 µA 0.062 % + 590 µA	Fluke 5522A/ Fluke 8846A Calibration of 280 series multimeters
DC Current Clamp Meters	± (10 to 16.5) A ± (16.5 to 150) A ± (150 to 1025) A	0.39 % + 16 mA 0.39 % + 0.11 A 0.39 % + 0.39 A	Fluke 5522A, Fluke 5500A/COIL, and a Fluke 8846A

Parameter	Range	(±) CMC[2, 5, 9]	Comments
Resistance Measuring Devices	(0 to 11) Ω	27 µΩ/Ω + 780 µΩ	Fluke 5522A/ Fluke 8846A Calibration of 280 series multimeters
	(11 to 33) Ω	19 µΩ/Ω + 1.2 mΩ	
	(33 to 110) Ω	17 µΩ/Ω + 1.1 mΩ	
	(110 to 330) Ω 330 Ω to 1.1 kΩ	17 µΩ/Ω + 1.6 mΩ	
	(1.1 to 3.3) kΩ (3.3 to 11) kΩ	17 µΩ/Ω + 16 mΩ	
	(11 to 33) kΩ (33 to 110) kΩ	17 µΩ/Ω + 160 mΩ	
	(110 to 330) kΩ	19 µΩ/Ω + 1.6 Ω	
	330 kΩ to 1.1 MΩ	19 µΩ/Ω + 1.7 Ω	
	(1.1 to 3.3) MΩ	31 µΩ/Ω + 24 Ω	
	(3.3 to 11) MΩ	80 µΩ/Ω + 120 Ω	
	(11 to 33) MΩ	0.016 % + 2.0 kΩ	
	(33 to 110) MΩ	0.024 % + 15 kΩ	
	(110 to 330) MΩ	0.19 % + 78 kΩ	
	(330 to 1100) MΩ	0.93 % + 420 kΩ	

AC Voltage Measuring Devices **(±) CMC[2, 5, 9]**						
AC Voltage	**Frequency**					
	(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
(1 to 33) mV	0.044 % + 6.0 µHz	93 µHz/Hz + 4.7 µHz	0.012 % + 4.7 µHz	0.062 % + 4.7 µHz	0.23 % + 9.3 µHz	0.47 % + 39 µHz
(33 to 330) mV	0.019 % + 6.9 µHz	0.011 % + 6.2 µHz	0.012 % + 6.2 µHz	0.023 % + 6.2 µHz	0.047 % + 25 µHz	0.12 % + 54 µHz
(0.33 to 3.3) V	0.019 % + 45 µHz	0.011 % + 47 µHz	0.012 % + 47 µHz	0.019 % + 39 µHz	0.043 % + 97 µHz	0.16 % + 470 µHz
(3.3 to 33) V	0.019 % + 580 µHz	97 µHz/Hz + 470 µHz	0.017 % + 470 µHz	0.023 % + 470 µHz	0.058 % + 1.2 mHz	
AC Voltage	**Frequency**					
	(45 to 1000) Hz	(1 to 5) kHz	(5 to 10) kHz	(10 to 20) kHz	(20 to 50) kHz	(50 to 100) kHz
(33 to 333) V	0.015 % + 2.1 mHz	0.012 % + 5.0 mHz	0.012 % + 5.0 mHz	0.017 % + 4.9 mHz	0.019 % + 4.9 mHz	0.12 % + 39 mHz
(330 to 1020) V	0.019 % + 8.0 mHz	0.016 % + 8.0 mHz	0.0194 % + 8.0 mHz			
Comments	Fluke 5522A/ Fluke 8846A Calibration of 280 series multimeters					

AC Current Measuring Devices **(±) CMC**[2, 5, 9]						
AC Current	**Frequency**					
	(10 to 20) Hz	(20 to 45) Hz	(45 to 1000) Hz	(1 to 5) kHz	(5 to 10) kHz	(10 to 30) kHz
(29 to 330) µA	0.12 % + 78 nA	0.093 % + 78 nA	0.078 % + 78 nA	0.19 % + 120 nA	0.47 % + 160 nA	0.93 % + 310 nA
(0.33 to 3.3) mA	0.12 % + 120 nA	0.078 % + 120 nA	0.062 % + 120 nA	0.12 % + 160 nA	0.31 % + 230 nA	0.62 % + 470 nA
(3.3 to 33) mA	0.12 % + 1.6 µA	0.058 % + 1.60 µA	0.027 % + 1.6 µA	0.050 % + 1.6 µA	0.12 % + 2.3 µA	0.25 % + 3.1 µA
(33 to 330) mA	0.12 % + 16 µA	0.058 % + 16 µA	0.027 % + 16 µA	0.062 % + 39 µA	0.12 % + 78 µA	0.25 % + 160 µA
(0.33 to 1.1) A	0.12 % + 78 µA	0.12 % + 78 µA	0.028 % + 78 µA	0.39 % + 780 µA	1.6 % + 3.9 mA	
(1.1 to 3) A			0.039 % + 78 µA			
AC Current	**Frequency**					
	(45 to 100) Hz		(100 to 1000) Hz		(1 to 5) kHz	
(3 to 11) A	0.039 % + 1.6 mA		0.062 % + 1.6 mA		1.9 % + 1.6 mA	
(11 to 20.5) A	0.078 % + 3.9 mA		0.10 % + 3.9 mA		1.9 % + 3.9 mA	
Comments	Fluke 5522A/ Fluke 8846A Calibration of 280 series multimeters					

AC Current Clamp Meters (±) CMC[2, 5, 9]			
Clamp Type: Toroidal			
AC Current	**Frequency**		
	(45 to 65) Hz	(65 to 100) Hz	(100 to 440) Hz
(10 to 16.5) A	0.22 % + 2.8 mA	0.61 % + 2.8 mA	0.63 % + 4.5 mA
(16.5 to 150) A	0.23 % + 21 mA	0.62 % + 22 mA	0.64 % + 44 mA
(150 to 1025) A	0.23 % + 100 mA	0.62 % + 110 mA	0.87 % + 210 mA
Clamp Type: Non-Toroidal			
AC Current	**Frequency**		
	(45 to 65) Hz	(65 to 100) Hz	(100 to 440) Hz
(10 to 16.5) A	0.44 % + 23 mA	0.78 % + 23 mA	0.79 % + 24 mA
(16.5 to 150) A	0.44 % + 190 mA	0.78 % + 190 mA	0.80 % + 200 mA
(150 to 1025) A	0.44 % + 700 mA	0.78 % + 700 mA	0.99 % + 720 mA
Comments	Fluke 5522A, Fluke 5500A/COIL, and Fluke 8846A Calibration of 280 series multimeters		

Parameter	Range	(±) CMC[2, 5, 9]	Comments
Capacitance Measuring Devices	(220 to 399.9) pF	0.30 % + 7.8 pF	Fluke 5522A/ Fluke 8846A calibration of 280 series multimeters
	(0.4 to 1.1) nF	0.30 % + 7.8 pF	
	(1.1 to 3.3) nF	0.27 % + 9.4 pF	
	(3.3 to 11) nF	0.14 % + 9.6 pF	
	(11 to 33) nF	0.13 % + 96 pF	
	(33 to 110) nF	0.14 % + 93 pF	
	(110 to 330) nF	0.10 % + 590 pF	
	(0.33 to 1.1) µF	0.14 % + 930 pF	
	(1.1 to 3.3) µF	0.10 % + 5.9 nF	
	(3.3 to 11) µF	0.14 % + 9.3 nF	
	(11 to 33) µF	0.18 % + 56 nF	
	(33 to 110) µF	0.26 % + 90 nF	
	(110 to 330) µF	3.7 µF/F + 580 µF	
	(0.33 to 1.1) mF	12 µF/F + 580 µF	
	(1.1 to 3.3) mF	0.21 % + 5.5 µF	
	(3.3 to 11) mF	0.26 % + 9.5 µF	
	(11 to 33) mF	0.50 % + 46 µF	
	(33 to 110) mF	0.77 % + 95 µF	
Electrical Simulation of **Thermocouples**	**Type J**		Fluke 5522A/ high resolution DUT calibration of Fluke 50 series temperature indicators
	(-210 to -100) ºC	0.16 ºC	
	(-100 to -30) ºC	0.093 ºC	
	(-30 to 150) ºC	0.078 ºC	
	(150 to 760) ºC	0.10 ºC	
	(760 to 1200) ºC	0.14 ºC	
	Type K		
	(-200 to -100) ºC	0.19 ºC	
	(-100 to -25) ºC	0.11 ºC	
	(-25 to 120) ºC	0.093 ºC	
	(120 to 1000) ºC	0.15 ºC	
	(1000 to 1372) ºC	0.23 ºC	
	Type T		
	(-250 to -150) ºC	0.37 ºC	
	(-150 to 0) ºC	0.14 ºC	
	(0 to 120) ºC	0.093 ºC	
	(120 to 400) ºC	0.078 ºC	

II. Time & Frequency

Parameter	Range	(±) CMC[2, 5, 9]	Comments
Frequency Measuring Devices	(3 to 20) Hz	1.4 µHz/Hz + 22 µHz	Fluke 5522A/ Fluke 8846A calibration of 280 series multimeters
	(20 to 200) Hz	1.7 µHz/Hz + 61 µHz	
	(200 to 2000) Hz	1.8 µHz/Hz + 340 µHz	
	(2 to 20) kHz	1.8 µHz/Hz + 3.4 mHz	
	(20 to 200) kHz	1.7 µHz/Hz + 51 mHz	
	(200 to 1000) kHz	1.7 µHz/Hz + 360 mHz	

[1] This laboratory offers commercial calibration service.

[2] Calibration and Measurement Capability Uncertainty (CMC) is the smallest uncertainty of measurement that a laboratory can achieve within its scope of accreditation when performing more or less routine calibrations of nearly ideal measurement standards or nearly ideal measuring equipment. CMCs represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of $k = 2$. The actual measurement uncertainty of a specific calibration performed by the laboratory may be greater than the CMC due to the behavior of the customer's device and to influences from the circumstances of the specific calibration.

[3] In the statement of CMC, L is the numerical value of the nominal length of the device measured in inches.

[4] The uncertainties shown relate to voltages and frequencies that lie within ± 10 % of the specified values. For intermediate points between the discrete current/voltage/frequency pairs, the uncertainty will be the greatest of the 4 adjacent voltage frequency/current frequency pairs, plus 10 %.

[5] The measurands stated are generated with the Fluke 4900, 5500, 5700 and 700 series of instruments. This capability is suitable for the calibration of the devices intended to measure the stated measurand in the ranges indicated. CMCs are expressed as either a specific value that covers the full range or as a fraction of the reading plus a fixed floor specification.

[6] In the statement of CMC, percentages are percent of reading, unless otherwise indicated.

[7] The uncertainty quoted on an A2LA certificate will include that of the reference standard plus any uncertainties attributable to the device under test during calibration.

[8] CMC values shown are for direct characterization and calibration of reference standard contributors traceable to NIST calibrated AC/DC difference (current) standards and shunts (ref. BIPM KCDB. Pages 23 and 67).

[9] The contributions from the "best existing device" are not included in the CMC claim for this parameter.

[10] CMCs apply to negative equivalent pressure.

[11] For intermediate Frequency points, the larger CMC from the adjacent Frequency points applies.

[12] The laboratory does not offer commercial calibration service for this measurement parameter.

[13] This scope meets A2LA's *P112 Flexible Scope Policy*.

[14] The type of instrument or material being calibrated is defined by the parameter. This indicates the laboratory is capable of calibrating instruments that measure or generate the values in the ranges indicated for the listed measurement parameter.

Accredited Laboratory

A2LA has accredited

FLUKE CORPORATION - EVERETT SERVICE CENTER

Everett, WA

for technical competence in the field of

Calibration

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets the requirements of ANSI/NCSLI Z540-1-1994 and R205 – Specific Requirements: Calibration Laboratory Accreditation Program. 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 April 2017*).

Presented this 26th day October 2018.

President and CEO
For the Accreditation Council
Certificate Number 2166.01
Valid to April 30, 2020

For the calibrations to which this accreditation applies, please refer to the laboratory's Calibration Scope of Accreditation.