Manual Supplement

Manual Title:	5700A/5720A Operator	Supplement Issue:	**10**
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This supplement contains information necessary to ensure the accuracy of the above manual. This manual is distributed as an electronic manual on the following CD-ROM:

CD Title:	5700A/5720A
CD Rev. & Date:	2, 2/2008
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Change #1, R

On pages 1-13 through 1-43, replace the entire ***Specification*** section with:

General Specifications

Warm-Up Time.....Twice the time since last warmed up, to a maximum of 30 minutes.

System Installation.....Rear output configuration and rack-mount kit available.

Standard Interfaces.....IEEE-488, RS-232, 5725A, 5205A or 5215A, 5220A, phase lock in (BNC), phase reference out (BNC).

Temperature Performance

- Operating.....0 °C to 50 °C
- Calibration.....15 °C to 35 °C
- Storage.....-40 °C to 75 °C

Relative Humidity

- Operating.....<80 % to 30 °C, <70 % to 40 °C, <40 % to 50 °C
- Storage.....<95 %, non-condensing. A power stabilization period of four days may be required after extended storage at high temperature and humidity.

Safety.....IEC61010-1: Overvoltage Category II, Pollution Degree 2

Electromagnetic Compatibility (EMC)

- IEC 61326-1.....(**Controlled** EM environment); CISPR 11, Group 1, Class A
  - Group 1 equipment.....Group 1 has intentionally generated and/or use conductively coupled radio-frequency energy which is necessary for the internal functioning of the equipment itself.
  - Class A equipment.....Class A equipment is equipment suitable for use in all establishments other than domestic and those directly connected to a low voltage power supply network which supplies buildings used for domestic purposes. Caution - There may be potential difficulties in ensuring electromagnetic compatibility in other environments, due to conducted and radiated disturbances.
- Emissions which exceed the levels required by CISPR 11 can occur when the equipment is connected to a test object.
- USA (FCC).....47 CFR 15 subpart B, this product is considered an exempt device per clause 15.103
- Korea (KCC).....Class A Equipment (Industrial Broadcasting & Communication Equipment) This product meets requirements for industrial (Class A) electromagnetic wave equipment and the seller or user should take notice of it. This equipment is intended for use in business environments and not to be used in homes.

Operating Altitude.....2000 m

Guard Isolation.....20 V

ElectroStatic Discharge.....This instrument meets criteria C for ESD requirements per EN61326

Line Power

- Line Frequency.....47 to 63 Hz; ±10 % 100 V, 110 V, 115 V, 120 V, 200 V, 220 V, 230 V, 240 V
- Maximum Power
  - 5700A/5720A.....300 VA
  - 5725A.....750 VA

Weight

- 5700A/5720A.....27 kg (62 lb)
- 5725A.....32 kg (70 lb)

Size

- 5700A/5720A
  - Height.....17.8 cm (7 in), standard rack increment, plus 1.5 cm (0.6 in) for feet
  - Width.....43.2 cm (17 in), standard rack width
  - Depth.....63.0 cm (24.8 in), overall; 57.8 cm (22.7 in), rack depth
- 5725A
  - Height.....13.3 cm (5.25 in)
  - Width and Depth.....Same as 5700A/5720A. Both units project 5.1 cm (2 in) from rack front.

Artifact Calibration Standards Requirements

Calibrating the 5700A Series II and 5720A to full specified absolute uncertainty requires using the following external standards, each with an uncertainty that is within the stated uncertainty limit.

Fluke Standard	Traceable Quantity	Nominal Value	Uncertainty Limit	5700A/5720A Series II Specifications Susceptible to Uncertainty Limit
732B	Voltage	10 V	±1.5 ppm	dc volts, ac volts, dc current, ac current
742A-1	Resistance	1 Ω	±10 ppm	1 Ω, 1.9 Ω
742A-10k	Resistance	10 kΩ	±4 ppm	ac current, dc current 10 Ω to 100 MΩ

Electrical Specifications

Note

Fluke guarantees performance verification using specifications stated to 99% confidence level.

DC Voltage Specifications

5720A Series II DC Voltage Specifications

Range	Resolution	Absolute Uncertainty ± 5 °C from calibration temperature [1]				Relative Uncertainty ± 1 °C	
		24 Hours	90 Days	180 Days	1 Year	24 Hours	90 Days
		± (ppm output + µV)					
99 % Confidence Level							
220 mV	10 nV	5 + 0.5	7 + 0.5	8 + 0.5	9 + 0.5	2 + 0.4	2.5 + 0.4
2.2 V	100 nV	3.5 + 0.8	4 + 0.8	4.5 + 0.8	6 + 0.8	2 + 0.8	2.5 + 0.8
11 V	1 µV	2.5 + 3	3 + 3	3.5 + 3	4 + 3	1 + 3	1.5 + 3
22 V	1 µV	2.5 + 5	3 + 5	3.5 + 5	4 + 5	1 + 5	1.5 + 5
220 V	10 µV	3.5 + 50	4 + 50	5 + 50	6 + 50	2 + 50	2.5 + 50
1100 V	100 µV	5 + 500	6 + 500	7 + 500	8 + 500	2.5 + 400	3 + 400
95 % Confidence Level							
220 mV	10 nV	4 + 0.4	6 + 0.4	6.5 + 0.4	7.5 + 0.4	1.6 + 0.4	2 + 0.4
2.2 V	100 nV	3 + 0.7	3.5 + 0.7	4 + 0.7	5 + 0.7	1.6 + 0.7	2 + 0.7
11 V	1 µV	2 + 2.5	2.5 + 2.5	3 + 2.5	3.5 + 2.5	0.8 + 2.5	1.2 + 2.5
22 V	1 µV	2 + 4	2.5 + 4	3 + 4	3.5 + 4	0.8 + 4	1.2 + 4
220 V	10 µV	3 + 40	3.5 + 40	4 + 40	5 + 40	1.6 + 40	2 + 40
1100 V	100 µV	4 + 400	4.5 + 400	6 + 400	6.5 + 400	2 + 400	2.4 + 400

Notes:

DC Zeros calibration required every 30 days.

1. For fields strengths >1 V/m but ≤3 V/m, in the band of 80 MHz to 1 GHz , add 0.01 % of range.

5700A Series II DC Voltage Specifications

Range	Resolution	Absolute Uncertainty ± 5 °C from calibration temperature [1]				Relative Uncertainty ± 1 °C	
		24 Hours	90 Days	180 Days	1 Year	24 Hours	90 Days
		± (ppm output + μV)					
99 % Confidence Level							
220 mV	10 nV	6.5 + .75	7 + .75	8 + .75	9 + .8	2.5 + .5	4 + .5
2.2 V	100 nV	3.5 + 1.2	6 + 1.2	7 + 1.2	8 + 1.2	2.5 + 1.2	4 + 1.2
11 V	1 μV	3.5 + 3	5 + 4	7 + 4	8 + 4	1.5 + 3	3.5 + 4
22 V	1 μV	3.5 + 6	5 + 8	7 + 8	8 + 8	1.5 + 6	3.5 + 8
220 V	10 μV	5 + 100	6 + 100	8 + 100	9 + 100	2.5 + 100	4 + 100
1100 V	100 μV	7 + 600	8 + 600	10 + 600	11 + 600	3 + 600	4.5 + 600
95 % Confidence Level							
220 mV	10 nV	5.5 + 0.6	6 + 0.6	7 + 0.6	8 + 0.6	2 + 0.4	3.5 + 0.4
2.2 V	100 nV	3.5 + 1	5 + 1	6 + 1	7 + 1	2 + 1	3.5 + 1
11 V	1 μV	3 + 3.5	4 + 3.5	6 + 3.5	7 + 3.5	1.2 + 3	3 + 3.5
22 V	1 μV	3 + 6.5	4 + 6.5	6 + 6.5	7 + 6.5	1.2 + 6	3 + 7
220 V	10 μV	4 + 80	5 + 80	7 + 80	8 + 80	2 + 80	3.5 + 80
1100 V	100 μV	6 + 500	7 + 500	8 + 500	9 + 500	2.4 + 500	4 + 500

Notes:

DC Zeros calibration required every 30 days.

1. For fields strengths >1 V/m but ≤3 V/m, in the band of 80 MHz to 1 GHz, add 0.01 % of range.

DC Voltage Secondary Performance Specifications and Operating Characteristics

Range	Stability [1] ± 1 °C 24 Hours	Temperature Coefficient Adder [2]		Linearity ± 1 °C	Noise	
		10 °C to 40 °C	0 °C to 10 °C and 40 °C to 50 °C		Bandwidth 0.1 Hz to 10 Hz pk-pk	Bandwidth 10 Hz to 10 kHz RMS
	± (ppm output + μV)	± (ppm output + μV) / °C		± (ppm output + μV)		μV
220 mV	0.3 + 0.3	0.4 + 0.1	1.5 + 0.5	1 + 0.2	0.15 + 0.1	5
2.2 V	0.3 + 1	0.3 + 0.1	1.5 + 2	1 + 0.6	0.15 + 0.4	15
11 V	0.3 + 2.5	0.15 + 0.2	1 + 1.5	0.3 + 2	0.15 + 2	50
22 V	0.4 + 5	0.2 + 0.4	1.5 + 3	0.3 + 4	0.15 + 4	50
220 V	0.5 + 40	0.3 + 5	1.5 + 40	1 + 40	0.15 + 60	150
1100 V	0.5 + 200	0.5 + 10	3 + 200	1 + 200	0.15 + 300	500

Notes:

1. Stability specifications are included in the Absolute Uncertainty values in the primary specification tables.
2. Temperature coefficient is an adder to uncertainty specifications that does *not* apply unless operating more than ±5 °C from calibration temperature.

Minimum Output .....0 V for all ranges, except 100 V for 1100 V range

Maximum Load .....50 mA for 2.2 V through 220 V ranges; 20 mA for 1100 V range; 50 Ω output impedance on 220 mV range; all ranges <1000 pF, >25 Ω

Load Regulation .....<(0.2 ppm of output + 0.1 ppm of range), full load to no load

Line Regulation .....<0.1 ppm change, ± 10 % of selected nominal line

Settling Time .....3 seconds to full accuracy; + 1 second for range or polarity change; + 1 second for 1100 V range

Overshoot .....<5 %

Common Mode Rejection .....140 dB, DC to 400 Hz

Remote Sensing .....Available 0 V to ±1100 V, on 2.2 V through 1100 V ranges

AC Voltage Specifications

5720A Series II AC Voltage Specifications: 99% Confidence Level

Range	Resolution	Frequency (Hz)	Absolute Uncertainty ± 5 °C from calibration temperature				Relative Uncertainty ± 1 °C	
			24 Hours	90 Days	180 Days	1 Year	24 Hours	90 Days
			± (ppm output + µV)					
2.2 mV	1 nV	10 to 20	250 + 5	270 + 5	290 + 5	300 + 5	250 + 5	270 + 5
		20 to 40	100 + 5	105 + 5	110 + 5	115 + 5	100 + 5	105 + 5
		40 to 20 k	85 + 5	90 + 5	95 + 5	100 + 5	60 + 5	65 + 5
		20 k to 50 k	220 + 5	230 + 5	240 + 5	250 + 5	85 + 5	95 + 5
		50 k to 100 k	500 + 6	540 + 6	570 + 6	600 + 6	200 + 6	220 + 6
		100 k to 300 k	1000 + 12	1200 + 12	1250 + 12	1300 + 12	350 + 12	400 + 12
		300 k to 500 k	1400 + 25	1500 + 25	1600 + 25	1700 + 25	800 + 25	1000 + 25
		500 k to 1 M	2900 + 25	3100 + 25	3250 + 25	3400 + 25	2700 + 25	3000 + 25
22 mV	10 nV	10 to 20	250 + 5	270 + 5	290 + 5	300 + 5	250 + 5	270 + 5
		20 to 40	100 + 5	105 + 5	110 + 5	115 + 5	100 + 5	105 + 5
		40 to 20 k	85 + 5	90 + 5	95 + 5	100 + 5	60 + 5	65 + 5
		20 k to 50 k	220 + 5	230 + 5	240 + 5	250 + 5	85 + 5	95 + 5
		50 k to 100 k	500 + 6	540 + 6	570 + 6	600 + 6	200 + 6	220 + 6
		100 k to 300 k	1000 + 12	1200 + 12	1250 + 12	1300 + 12	350 + 12	400 + 12
		300 k to 500 k	1400 + 25	1500 + 25	1600 + 25	1700 + 25	800 + 25	1000 + 25
		500 k to 1 M	2900 + 25	3100 + 25	3250 + 25	3400 + 25	2700 + 25	3000 + 25
220 mV	100 nV	10 to 20	250 + 15	270 + 15	290 + 15	300 + 15	250 + 15	270 + 15
		20 to 40	100 + 8	105 + 8	110 + 8	115 + 8	100 + 8	105 + 8
		40 to 20 k	85 + 8	90 + 8	95 + 8	100 + 8	60 + 8	65 + 8
		20 k to 50 k	220 + 8	230 + 8	240 + 8	250 + 8	85 + 8	95 + 8
		50 k to 100 k	500 + 20	540 + 20	570 + 20	600 + 20	200 + 20	220 + 20
		100 k to 300 k	850 + 25	900 + 25	1000 + 25	1100 + 25	350 + 25	400 + 25
		300 k to 500 k	1400 + 30	1500 + 30	1600 + 30	1700 + 30	800 + 30	1000 + 30
		500 k to 1 M	2700 + 60	2900 + 60	3100 + 60	3300 + 60	2600 + 60	2800 + 60
2.2 V	1 µV	10 to 20	250 + 50	270 + 50	290 + 50	300 + 50	250 + 50	270 + 50
		20 to 40	95 + 20	100 + 20	105 + 20	110 + 20	95 + 20	100 + 20
		40 to 20 k	45 + 10	47 + 10	50 + 10	52 + 10	30 + 10	40 + 10
		20 k to 50 k	80 + 12	85 + 12	87 + 12	90 + 12	70 + 12	75 + 12
		50 k to 100 k	120 + 40	125 + 40	127 + 40	130 + 40	100 + 40	105 + 40
		100 k to 300 k	380 + 100	420 + 100	460 + 100	500 + 100	270 + 100	290 + 100
		300 k to 500 k	1000 + 250	1100 + 250	1150 + 250	1200 + 250	900 + 250	1000 + 250
		500 k to 1 M	1600 + 400	1800 + 400	1900 + 400	2000 + 400	1200 + 400	1300 + 400
22 V	10 µV	10 to 20	250 + 500	270 + 500	290 + 500	300 + 500	250 + 500	270 + 500
		20 to 40	95 + 200	100 + 200	105 + 200	110 + 200	95 + 200	100 + 200
		40 to 20 k	45 + 70	47 + 70	50 + 70	52 + 70	30 + 70	40 + 70
		20 k to 50 k	80 + 120	85 + 120	87 + 120	90 + 120	70 + 120	75 + 120
		50 k to 100 k	110 + 250	115 + 250	117 + 250	120 + 250	100 + 250	105 + 250
		100 k to 300 k	300 + 800	310 + 800	320 + 800	325 + 800	270 + 800	290 + 800
		300 k to 500 k	1000 + 2500	1100 + 2500	1150 + 2500	1200 + 2500	900 + 2500	1000 + 2500
		500 k to 1 M	1500 + 4000	1600 + 4000	1700 + 4000	1800 + 4000	1300 + 4000	1400 + 4000
			± (ppm output + mV)					
220 V [2]	100 µV	10 to 20	250 + 5	270 + 5	290 + 5	300 + 5	250 + 5	270 + 5
		20 to 40	95 + 2	100 + 2	105 + 2	110 + 2	95 + 2	100 + 2
		40 to 20 k	57 + 0.7	60 + 0.7	62 + 0.7	65 + 0.7	45 + 0.7	50 + 0.7
		20 k to 50 k	90 + 1.2	95 + 1.2	97 + 1.2	100 + 1.2	75 + 1.2	80 + 1.2
		50 k to 100 k	160 + 3	170 + 3	175 + 3	180 + 3	140 + 3	150 + 3
		100 k to 300 k	900 + 20	1000 + 20	1050 + 20	1100 + 20	600 + 20	700 + 20
		300 k to 500 k	5000 + 50	5200 + 50	5300 + 50	5400 + 50	4500 + 50	4700 + 50
		500 k to 1 M	8000 + 100	9000 + 100	9500 + 100	10,000 + 100	8000 + 100	8500 + 100
1100 V[1]	1 mV	15 to 50	300 + 20	320 + 20	340 + 20	360 + 20	300 + 20	320 + 20
		50 to 1 k	70 + 4	75 + 4	80 + 4	85 + 4	50 + 4	55 + 4

5725A Amplifier:								
1100 V	1 mV	40 to 1 k	75 + 4	80 + 4	85 + 4	90 + 4	50 + 4	55 + 4
		1 k to 20 k	105 + 6	125 + 6	135 + 6	165 + 6	85 + 6	105 + 6
		20 k to 30 k	230 + 11	360 + 11	440 + 11	600 + 11	160 + 11	320 + 11
750 V		30 k to 50 k	230 + 11	360 + 11	440 + 11	600 + 11	160 + 11	320 + 11
		50 k to 100k	600 + 45	1300 + 45	1600 + 45	2300 + 45	380 + 45	1200 + 45

Notes:

1. Maximum output 250 V from 15 Hz to 50 Hz.
2. See Volt-Hertz capability in Figure A.

5720A Series II AC Voltage Specifications: 95 % Confidence Level

Range	Resolution	Frequency (Hz)	Absolute Uncertainty ± 5 °C from calibration temperature				Relative Uncertainty ± 1 °C	
			24 Hours	90 Days	180 Days	1 Year	24 Hours	90 Days
			± (ppm output + μV)					
2.2 mV	1 nV	10 to 20	200 + 4	220 + 4	230 + 4	240 + 4	200 + 4	220 + 4
		20 to 40	80 + 4	85 + 4	87 + 4	90 + 4	80 + 4	85 + 4
		40 to 20 k	70 + 4	75 + 4	77 + 4	80 + 4	50 + 4	55 + 4
		20 k to 50 k	170 + 4	180 + 4	190 + 4	200 + 4	70 + 4	80 + 4
		50 k to 100 k	400 + 5	460 + 5	480 + 5	500 + 5	160 + 5	180 + 5
		100 k to 300 k	800 + 10	900 + 10	1000 + 10	1050 + 10	280 + 10	320 + 10
		300 k to 500 k	1100 + 20	1200 + 20	1300 + 20	1400 + 20	650 + 20	800 + 20
		500 k to 1 M	2400 + 20	2500 + 20	2600 + 20	2700 + 20	2100 + 20	2400 + 20
22 mV	10 nV	10 to 20	200 + 4	220 + 4	230 + 4	240 + 4	200 + 4	220 + 4
		20 to 40	80 + 4	85 + 4	87 + 4	90 + 4	80 + 4	85 + 4
		40 to 20 k	70 + 4	75 + 4	77 + 4	80 + 4	50 + 4	55 + 4
		20 k to 50 k	170 + 4	180 + 4	190 + 4	200 + 4	70 + 4	80 + 4
		50 k to 100 k	400 + 5	460 + 5	480 + 5	500 + 5	160 + 5	180 + 5
		100 k to 300 k	800 + 10	900 + 10	1000 + 10	1050 + 10	280 + 10	320 + 10
		300 k to 500 k	1100 + 20	1200 + 20	1300 + 20	1400 + 20	650 + 20	800 + 20
		500 k to 1 M	2400 + 20	2500 + 20	2600 + 20	2700 + 20	2100 + 20	2400 + 20
220 mV	100 nV	10 to 20	200 + 12	220 + 12	230 + 12	240 + 12	200 + 12	220 + 12
		20 to 40	80 + 7	85 + 7	87 + 7	90 + 7	80 + 7	85 + 7
		40 to 20 k	70 + 7	75 + 7	77 + 7	80 + 7	50 + 7	55 + 7
		20 k to 50 k	170 + 7	180 + 7	190 + 7	200 + 7	70 + 7	80 + 7
		50 k to 100 k	400 + 17	420 + 17	440 + 17	460 + 17	160 + 17	180 + 17
		100 k to 300 k	700 + 20	750 + 20	800 + 20	900 + 20	280 + 20	320 + 20
		300 k to 500 k	1100 + 25	1200 +25	1300 + 25	1400 + 25	650 + 25	800 + 25
		500 k to 1 M	2400 + 45	2500 + 45	2600 + 45	2700 + 45	2100 + 45	2400 + 45
2.2 V	1 μV	10 to 20	200 + 40	220 + 40	230 + 40	240 + 40	200 + 40	220 + 40
		20 to 40	75 + 15	80 + 15	85 + 15	90 + 15	75 + 15	80 + 15
		40 to 20 k	37 + 8	40 + 8	42 + 8	45 + 8	25 + 8	35 + 8
		20 k to 50 k	65 + 10	70 + 10	73 + 10	75 + 10	55 + 10	60 + 10
		50 k to 100 k	100 + 30	105 + 30	107 + 30	110 + 30	80 + 30	85 + 30
		100 k to 300 k	300 + 80	340 + 80	380 + 80	420 + 80	230 + 80	250 + 80
		300 k to 500 k	800 + 200	900 + 200	950 + 200	1000 + 200	700 + 200	800 + 200
		500 k to 1 M	1300 + 300	1500 + 300	1600 + 300	1700 + 300	1000 + 300	1100 + 300
22 V	10 μV	10 to 20	200 + 400	220 + 400	230 + 400	240 + 400	200 + 400	220 + 400
		20 to 40	75 + 150	80 + 150	85 + 150	90 + 150	75 + 150	80 + 150
		40 to 20k	37 + 50	40 + 50	42 + 50	45 + 50	25 + 50	35 + 50
		20k to 50k	65 + 100	70 + 100	73 + 100	75 + 100	55 + 100	60 + 100
		50k to 100k	90 + 200	95 + 200	97 + 200	100 + 200	80 + 200	85 + 200
		100k to 300k	250 + 600	260 + 600	270 + 600	275 + 600	250 + 600	270 + 600
		300k to 500k	800 + 2000	900 + 2000	900 + 2000	1000 + 2000	700 + 2000	800 + 2000
		500k to 1M	1200 + 3200	1300 + 3200	1400 + 3200	1500 + 3200	1100 + 3200	1200 + 3200

		± (ppm output + mV)						
220 V [2]	100 μV	10 to 20	200 +4	220 + 4	230 + 4	240 + 4	200 + 4	220 + 4
		20 to 40	75 + 1.5	80 + 1.5	85 + 1.5	90 + 1.5	75 + 1.5	80 + 1.5
		40 to 20 k	45 + 0.6	47 + 0.6	50 + 0.6	52 + 0.6	35 + 0.6	40 + 0.6
		20 k to 50 k	70 + 1	75 + 1	77 + 1	80 + 1	60 + 1	65 + 1
		50 k to 100 k	120 + 2.5	130 + 2.5	140 + 2.5	150 + 2.5	110 + 2.5	120 + 2.5
		100 k to 300 k	700 + 16	800 + 16	850 + 16	900 + 16	500 + 16	600 + 16
		300 k to 500 k	4000 + 40	4200 + 40	4300 + 40	4400 + 40	3600 + 40	3800 + 40
		500 k to 1 M	6000 + 80	7000 + 80	7500 + 80	8000 + 80	6500 + 80	7000 + 80
1100 V[1]	1 mV	15 to 50	240 + 16	260 + 16	280 + 16	300 + 16	240 + 16	260 + 16
		50 to 1 k	55 + 3.5	60 + 3.5	65 + 3.5	70 + 3.5	40 + 3.5	45 + 3.5
5725A Amplifier:								
1100 V	1 mV	40 to 1 k	75 + 4	80 + 4	85 + 4	90 + 4	50 + 4	55 + 4
		1 k to 20 k	105 + 6	125 + 6	135 + 6	165 + 6	85 + 6	105 + 6
		20 k to 30 k	230 + 11	360 + 11	440 + 11	600 + 11	160 + 11	320 + 11
750 V		30 k to 50 k	230 + 11	360 + 11	440 + 11	600 + 11	160 + 11	320 + 11
		50 k to 100 k	600 + 45	1300 + 45	1600 + 45	2300 + 45	380 + 45	1200 + 45

Notes:

1. Maximum output 250 V from 15 Hz to 50 Hz.
2. See Volt-Hertz capability in Figure A.

5700A Series II AC Voltage Specifications: 99 % Confidence Level

Range	Resolution	Frequency (Hz)	Absolute Uncertainty ± 5 °C from calibration temperature				Relative Uncertainty ± 1 °C	
			24 Hours	90 Days	180 Days	1 Year	24 Hours	90 Days
			± (ppm output + μV)					
2.2 mV	1 nV	10 to 20	500 + 5	550 + 5	600 + 5	600 + 5	500 + 5	550 + 5
		20 to 40	200 + 5	220 + 5	230 + 5	240 + 5	200 + 5	220 + 5
		40 to 20 k	100 + 5	110 + 5	120 + 5	120 + 5	60 + 5	65 + 5
		20 k to 50 k	340 + 5	370 + 5	390 + 5	410 + 5	100 + 5	110 + 5
		50 k to 100 k	800 + 8	900 + 8	950 + 8	950 + 8	220 + 8	240 + 8
		100 k to 300 k	1100 + 15	1200 + 15	1300 + 15	1300 + 15	400 + 15	440 + 15
		300 k to 500 k	1500 + 30	1700 + 30	1700 + 30	1800 + 30	1000 + 30	1100 + 30
		500 k to 1 M	4000 + 40	4400 + 40	4700 + 40	4800 + 40	400 + 30	4400 + 30
22 mV	10 nV	10 to 20	500 + 6	550 + 6	600 + 6	600 + 6	500 + 6	550 + 6
		20 to 40	200 + 6	220 + 6	230 + 6	240 + 6	200 + 6	220 + 6
		40 to 20 k	100 + 6	110 + 6	120 + 6	120 + 6	60 + 6	65 + 6
		20 k to 50 k	340 + 6	370 + 6	390 + 6	410 + 6	100 + 6	110 + 6
		50 k to 100 k	800 + 8	900 + 8	950 + 8	950 + 8	220 + 8	240 + 8
		100 k to 300 k	1100 + 15	1200 + 15	1300 + 15	1300 + 15	400 + 15	440 + 15
		300 k to 500 k	1500 + 30	1700 + 30	1700 + 30	1800 + 30	1000 + 30	1100 + 30
		500 k to 1 M	4000 + 40	4400 + 40	4700 + 40	4800 + 40	4000 + 30	4400 + 30
220 mV	100 nV	10 to 20	500 + 16	550 + 16	600 + 16	600 + 16	500 + 16	550 + 16
		20 to 40	200 + 10	220 + 10	230 + 10	240 + 10	200 + 10	220 + 10
		40 to 20 k	95 + 10	100 + 10	110 + 10	110 + 10	60 + 10	65 + 10
		20 k to 50 k	300 + 10	330 + 10	350 + 10	360 + 10	100 + 10	110 + 10
		50 k to 100 k	750 + 30	800 + 30	850 + 30	900 + 30	220 + 30	240 + 30
		100 k to 300 k	940 + 30	1000 + 30	1100 + 30	1100 + 30	400 + 30	440 + 30
		300 k to 500 k	1500 + 40	1700 + 40	1700 + 40	1800 + 40	1000 + 40	1100 + 40
		500 k to 1 M	3000 + 100	3300 + 100	3500 + 100	3600 + 100	3000 + 100	3300 + 100
2.2 V	1 μV	10 to 20	500 + 100	550 + 100	600 + 100	600 + 100	500 + 100	550 + 100
		20 to 40	150 + 30	170 + 30	170 + 30	180 + 30	150 + 30	170 + 30
		40 to 20 k	70 + 7	75 + 7	80 + 7	85 + 7	40 + 7	45 + 7
		20 k to 50 k	120 + 20	130 + 20	140 + 20	140 + 20	100 + 20	110 + 20
		50 k to 100 k	230 + 80	250 + 80	270 + 80	280 + 80	200 + 80	220 + 80
		100 k to 300 k	400 + 150	440 + 150	470 + 150	480 + 150	400 + 150	440 + 150
		300 k to 500 k	1000 + 400	1100 + 400	1200 + 400	1200 + 400	1000 + 400	1100 + 400
		500 k to 1 M	2000 + 1000	2200 + 1000	2300 + 1000	2400 + 1000	2000 + 1000	2200 + 1000
22 V	10 μV	10 to 20	500 + 1000	550 + 1000	600 + 1000	600 + 1000	500 + 1000	550 + 1000
		20 to 40	150 + 300	170 + 300	170 + 300	180 + 300	150 + 300	170 + 300
		40 to 20 k	70 + 70	75 + 70	80 + 70	85 + 70	40 + 70	45 + 70
		20 k to 50 k	120 + 200	130 + 200	140 + 200	140 + 200	100 + 200	110 + 200
		50 k to 100 k	230 + 400	250 + 400	270 + 400	280 + 400	200 + 400	220 + 400
		100 k to 300 k	500 + 1700	550 + 1700	550 + 1700	600 + 1700	500 + 1700	550 + 1700
		300 k to 500 k	1200 + 5000	1300 + 5000	1300 + 5000	1400 + 5000	1200 + 5000	1300 + 5000
		500 k to 1 M	2600 + 9000	2800 + 9000	2900 + 9000	3000 + 9000	2600 + 9000	2800 + 9000
			± (ppm output + mV)					
220 V [2]	100 μV	10 to 20	500 + 10	550 + 10	600 + 10	600 + 10	500 + 10	550 + 10
		20 to 40	150 + 3	170 + 3	170 + 3	180 + 3	150 + 3	170 + 3
		40 to 20 k	75 + 1	80 + 1	85 + 1	90 + 1	45 + 1	50 + 1
		20 k to 50 k	200 + 4	220 + 4	240 + 4	250 + 4	100 + 1	110 + 1
		50 k to 100 k	500 + 10	550 + 10	600 + 10	600 + 10	300 + 10	330 + 10
		100 k to 300 k	1500 + 110	1500 + 110	1600 + 110	1600 + 110	1500 + 110	1500 + 100
		300 k to 500 k	5000 + 110	5200 + 110	5300 + 110	5400 + 110	5000 + 110	5200 + 110
		500 k to 1 M	12,000 + 220	12,500 + 220	12,500 + 220	13,000 + 220	12,000 + 220	12,000 + 220
1100 V [1]	1 mV	15 to 50	400 + 20	420 + 20	440 + 20	460 + 20	400 + 20	420 + 20
		50 to 1 k	75 + 4	80 + 4	85 + 4	90 + 4	50 + 4	55 + 4

5725A Amplifier:								
1100 V	1 mV	40 to 1 k	75 + 4	80 + 4	85 + 4	90 + 4	50 + 4	55 + 4
		1 k to 20 k	105 + 6	125 + 6	135 + 6	165 + 6	85 + 6	105 + 6
		20 k to 30 k	230 + 11	360 + 11	440 + 11	600 + 11	160 + 11	320 + 11
750 V		30 k to 50 k	230 + 11	360 + 11	440 + 11	600 + 11	160 + 11	320 + 11
		50 k to 100 k	600 + 45	1300 + 45	1600 + 45	2300 + 45	380 + 45	1200 + 45

Notes:

1. Maximum output 250 V from 15 Hz to 50 Hz.
2. See Volt-Hertz capability in Figure A.

5700A Series II AC Voltage Specifications: 95 % Confidence Level

Range	Resolution	Frequency (Hz)	Absolute Uncertainty ± 5 °C from calibration temperature				Relative Uncertainty ± 1 °C	
			24 Hours	90 Days	180 Days	1 Year	24 Hours	90 Days
			± (ppm output + μV)					
2.2 mV	1 nV	10 to 20	400 + 4.5	500 + 4.5	530 + 4.5	550 + 4.5	400 + 4.5	500 + 4.5
		20 to 40	170 + 4.5	190 + 4.5	200 + 4.5	210 + 4.5	170 + 4.5	190 + 4.5
		40 to 20 k	85 + 4.5	95 + 4.5	100 + 4.5	105 + 4.5	55 + 4.5	60 + 4.5
		20 k to 50 k	300 + 4.5	330 + 4.5	350 + 4.5	370 + 4.5	90 + 4.5	100 + 4.5
		50 k to 100 k	700 + 7	750 + 7	800 + 7	850 + 7	210 + 7	230 + 7
		100 k to 300 k	900 + 13	1000 + 13	1050 + 13	1100 + 13	380 + 13	420 + 13
		300 k to 500 k	1300 + 25	1500 + 25	1600 + 25	1700 + 25	900 + 25	1000 + 25
		500 k to 1 M	2800 + 25	3100 + 25	3300 + 25	3400 + 25	2900 + 25	3200 + 25
22 mV	10 nV	10 to 20	400 + 5	500 + 5	530 + 5	550 + 5	400 + 5	500 + 5
		20 to 40	170 + 5	190 + 5	200 + 5	210 + 5	170 + 5	190 + 5
		40 to 20 k	85 + 5	95 + 5	100 + 5	105 + 5	55 + 5	60 + 5
		20 k to 50 k	300 + 5	330 + 5	350 + 5	370 + 5	90 + 5	100 + 5
		50 k to 100 k	700 + 7	750 + 7	800 + 7	850 + 7	210 + 7	230 + 7
		100 k to 300 k	900 + 12	1000 + 12	1050 + 12	1100 + 12	380 + 12	420 + 12
		300 k to 500 k	1300 + 25	1500 + 25	1600 + 25	1700 + 25	900 + 25	1000 + 25
		500 k to 1 M	2800 + 25	3100 + 25	3300 + 25	3400 + 25	2900 + 25	3200 + 25
220 mV	100 nV	10 to 20	400 + 13	500 + 13	530 + 13	550 + 13	400 + 13	500 + 13
		20 to 40	170 + 8	190 + 8	200 + 8	210 + 8	170 + 8	190 + 8
		40 to 20 k	85 + 8	95 + 8	100 + 8	105 + 8	55 + 8	60 + 8
		20 k to 50 k	250 + 8	280 + 8	300 + 8	320 + 8	90 + 8	100 + 8
		50 k to 100 k	700 + 25	750 + 25	800 + 25	850 + 25	210 + 25	230 + 25
		100 k to 300 k	900 + 25	1000 + 25	1050 + 25	1100 + 25	380 + 25	420 + 25
		300 k to 500 k	1300 + 35	1500 + 35	1600 + 35	1700 + 35	900 + 35	1000 + 35
		500 k to 1 M	2800 + 80	3100 + 80	3300 + 80	3400 + 80	2900 + 80	3200 + 80
2.2 V	1 μV	10 to 20	400 + 80	450 + 80	480 + 80	500 + 80	400 + 80	450 + 80
		20 to 40	130 + 25	140 + 25	150 + 25	160 + 25	130 + 25	140 + 25
		40 to 20 k	60 + 6	65 + 6	70 + 6	75 + 6	35 + 6	40 + 6
		20 k to 50 k	105 + 16	110 + 16	115 + 16	120 + 16	85 + 16	95 + 16
		50 k to 100 k	190 + 70	210 + 70	230 + 70	250 + 70	170 + 70	190 + 70
		100 k to 300 k	350 + 130	390 + 130	420 + 130	430 + 130	340 + 130	380 + 130
		300 k to 500 k	850 + 350	950 + 350	1000 + 350	1050 + 350	850 + 350	950 + 350
		500 k to 1 M	1700 + 850	1900 + 850	2100 + 850	2200 + 850	1700 + 850	1900 + 850
22 V	10 μV	10 to 20	400 + 800	450 + 800	480 + 800	500 + 800	400 + 800	450 + 800
		20 to 40	130 + 250	140 + 250	150 + 250	160 + 250	130 + 250	140 + 250
		40 to 20 k	60 + 60	65 + 60	70 + 60	75 + 60	35 + 60	40 + 60
		20 k to 50 k	105 + 160	110 + 160	115 + 160	120 + 160	85 + 160	95 + 160
		50 k to 100 k	190 + 350	210 + 350	230 + 350	250 + 350	170 + 350	190 + 350
		100 k to 300 k	400 + 1500	450 + 1500	470 + 1500	500 + 1500	400 + 1500	450 + 1500
		300 k to 500 k	1050 + 4300	1150 + 4300	1200 + 4300	1250 + 4300	1000 + 4300	1100 + 4300
		500 k to 1 M	2300 + 8500	2500 + 8500	2600 + 8500	2700 + 8500	2200 + 8500	2400 + 8500

		± (ppm output + mV)						
220 V [2]	100 μV	10 to 20	400 + 8	450 + 8	480 + 8	500 + 8	400 + 8	450 + 8
		20 to 40	130 + 2.5	140 + 2.5	150 + 2.5	160 + 2.5	130 + 2.5	140 + 2.5
		40 to 20 k	65 + 0.8	70 + 0.8	75 + 0.8	80 + 0.8	40 + 0.8	45 + 0.8
		20 k to 50 k	170 + 3.5	190 + 3.5	210 + 3.5	220 + 3.5	85 + 3.5	95 + 3.5
		50 k to 100 k	400 + 8	450 + 8	480 + 8	500 + 8	270 + 8	300 + 8
		100 k to 300 k	1300 + 90	1400 + 90	1450 + 90	1500 + 90	1200 + 90	1300 + 90
		300 k to 500 k	4300 + 90	4500 + 90	4600 + 90	4700 + 90	4200 + 90	4500 + 90
		500 k to 1 M	10,500 + 190	11,000 + 190	11,300 + 190	11,500 + 190	10,500 + 190	11,000 + 190
1100 V[1]	1 mV	15 to 50	340 + 16	360 + 16	380 + 16	400 + 16	340 + 16	360 + 16
		50 to 1 k	65 + 3.5	70 + 3.5	75 + 3.5	80 + 3.5	45 + 3.5	50 + 3.5
5725A Amplifier:								
1100 V	1 mV	40 to 1 k	75 + 4	80 + 4	85 + 4	90 + 4	50 + 4	55 + 4
		1 k to 20 k	105 + 6	125 + 6	135 + 6	165 + 6	85 + 6	105 + 6
		20 k to 30 k	230 + 11	360 + 11	440 + 11	600 + 11	160 + 11	320 + 11
750 V		30 k to 50 k	230 + 11	360 + 11	440 + 11	600 + 11	160 + 11	320 + 11
		50 k to 100 k	600 + 45	1300 + 45	1600 + 45	2300 + 45	380 + 45	1200 + 45

Notes:

1. Maximum output 250 V from 15 Hz to 50 Hz.
2. See Volt-Hertz capability in Figure A.

AC Voltage Secondary Performance Specifications and Operating Characteristics

Range	Frequency (Hz)	Stability ± 1 °C [1] 24 Hours	Temperature Coefficient		Output Impedance (Ω)	Maximum Distortion Bandwidth 10 Hz to 10 MHz
			10 °C to 40 °C	0 °C to 10 °C and 40 °C to 50 °C		
		± μV	±μV / °C			± (% output + μV)
2.2 mV	10 to 20	5	0.05	0.05	50	0.05 + 10
	20 to 40	5	0.05	0.05		0.035 + 10
	40 to 20 k	2	0.05	0.05		0.035 + 10
	20 k to 50 k	2	0.1	0.1		0.035 + 10
	50 k to 100 k	3	0.2	0.2		0.035 + 30
	100 k to 300 k	3	0.3	0.3		0.3 + 30
	300 k to 500 k	5	0.4	0.4		0.3 + 30
	500 k to 1 M	5	0.5	0.5		2 + 50
22 mV	10 to 20	5	0.2	0.3	50	0.05 + 11
	20 to 40	5	0.2	0.3		0.035 + 11
	40 to 20 k	2	0.2	0.3		0.035 + 11
	20 k to 50 k	2	0.4	0.5		0.035 + 11
	50 k to 100 k	3	0.5	0.5		0.035 + 30
	100 k to 300 k	5	0.6	0.6		0.3 + 30
	300 k to 500 k	10	1	1		0.3 + 30
	500 k to 1 M	15	1	1		2 + 30
		± (ppm output + μV)	± (ppm output μV) / °C			
220 mV	10 to 20	150 + 20	2 + 1	2 + 1	50	0.05 + 16
	20 to 40	80 + 15	2 + 1	2 + 1		0.035 + 16
	40 to 20 k	12 + 2	2 + 1	2 + 1		0.035 + 16
	20 k to 50 k	10 + 2	15 + 2	15 + 2		0.035 + 16
	50 k to 100 k	10 + 2	15 + 4	15 + 4		0.035 + 30
	100 k to 300 k	20 + 4	80 + 5	80 + 5		0.3 + 30
	300 k to 500 k	100 + 10	80 + 5	80 + 5		0.3 + 30
	500 k to 1 M	200 + 20	80 + 5	80 + 5		1 + 30
					Load Regulation ±(ppm output+ μV)	
2.2 V	10 to 20	150 + 20	50 + 10	50 + 10	10 + 2	0.05 + 80
	20 to 40	80 + 15	15 + 5	15 + 5	10 + 2	0.035 + 80
	40 to 20 k	12 + 4	2 + 1	5 + 2	10 + 4	0.035 + 80
	20 k to 50 k	15 + 5	10 + 2	15 + 4	30 + 10	0.035 + 80
	50 k to 100 k	15 + 5	10 + 4	20 + 4	120 + 16	0.035 + 110
	100 k to 300 k	30 + 10	80 + 15	80 + 15	300 ppm	0.3 + 110
	300 k to 500 k	70 + 20	80 + 40	80 + 40	600 ppm	0.5 + 110
	500 k to 1 M	150 + 50	80 + 100	80 + 100	1200 ppm	1 + 110
22 V	10 to 20	150 + 20	50 + 100	50 + 100	10 + 20	0.05 + 700
	20 to 40	80 + 15	15 + 30	15 + 40	10 + 20	0.035 + 700
	40 to 20 k	12 + 8	2 + 10	4 + 15	10 + 30	0.035 + 700
	20 k to 50 k	15 + 10	10 + 20	20 + 20	30 + 50	0.035 + 700
	50 k to 100 k	15 + 10	10 + 40	20 + 40	80 + 80	0.05 + 800
	100 k to 300 k	30 + 15	80 + 150	80 + 150	100 + 700	0.3 + 800
	300 k to 500 k	70 + 100	80 + 300	80 + 300	200 + 1100	0.3 + 800
	500 k to 1 M	150 + 100	80 + 500	80 + 500	600 + 3000	2 + 800
220 V	10 to 20	150 + 200	50 + 1000	50 + 1000	10 + 200	0.05 + 10,000
	20 to 40	80 + 150	15 + 300	15 + 300	10 + 200	0.05 + 10,000
	40 to 20 k	12 + 80	2 + 80	4 + 80	10 + 300	0.05 + 10,000
	20 k to 50 k	15 + 100	10 + 100	20 + 100	30 + .600	0.05 + 10,000
	50 k to 100 k	15 + 100	10 + 500	20 + 500	80 + 3,000	0.2 + 50,000
	100 k to 300 k	30 + 400	80 + 600	80 + 600	250 + 25,000	1.5 + 50,000
	300 k to 500 k	100 + 10,000	80 + 800	80 + 800	500 + 50,000	1.5 + 50,000
	500 k to 1 M	200 + 20,000	80 + 1000	80 + 1000	1000 + 110,000	3.5 + 100,000
		±(ppm output + mV)	±(ppm output) / °C		±(ppm output + mV)	±(% output)
1100 V	15 to 50	150 + 0.5	50	50	10 + 2	0.15
	50 to 1 k	20 + 0.5	2	5	10 + 1	0.07

5725A Amplifier:							
Range	Frequency (Hz)	Stability ± 1 °C [1] 24 Hours	Temperature Coefficient Adder		Load Regulation [2]	Distortion Bandwidth 10 Hz to 10 MHz ±(% output)	
			10 °C to 40 °C	0 °C to 10 °C and 40 °C to 50 °C			
		±(ppm output + mV)	±(ppm output) / °C		±(ppm output + mV)	150 pF	1000 pF
1100 V	40 to 1 k	10 + .5	5	5	10 + 1	0.10	0.10
	1 k to 20 k	15 + 2	5	5	90 + 6	0.10	0.15
	20 k to 50 k	40 + 2	10	10	275 + 11	0.30	0.30
	50 k to 100 k	130 + 2	30	30	500 + 30	0.40	0.40

Notes:

1. Stability specifications are included in Absolute Uncertainty values for the primary specifications.
2. The 5725A will drive up to 1000 pF of load capacitance. Uncertainty specifications include loads to 300 pF and 150 pF as shown under "Load Limits." For capacitances up to the maximum of 1000 pF, add "Load Regulation."

Voltage Range	Maximum Current Limits		Load Limits
2.2 V [2] 22 V 220 V	50 mA, 0 °C to 40 °C 20 mA, 40 °C to 50 °C		>50 Ω, 1000 pF
1100 V	6 mA		600 pF
5725A Amplifier:			
1100 V	40 Hz to 5 kHz	50 mA	1000 pF [1]
	5 kHz to 30 kHz	70 mA	300 pF
	30 kHz to 100 kHz	70 mA[3]	150 pF

Notes:

1. The 5725A will drive up to 1000 pF of load capacitance. Uncertainty specifications include loads to 300 pF and 150 pF as shown under "Load Limits." For capacitances up to the maximum of 1000 pF, add "Load Regulation."
2. 2.2 V Range, 100 kHz to 1.2 MHz only: uncertainty specifications cover loads to 10 mA or 1000 pF. For higher loads, load regulation is added.
3. Applies from 0 °C to 40 °C.

Output Display Formats.....Voltage or dBm, dBm reference 600 Ω.

Minimum Output .....10 % on each range

External Sense .....Applicable for 2.2 V, 22 V, 220 V, and 1100 V ranges; 5700A/5720A <100 kHz, 5725A <30 kHz. Specifications are the same as internal sense.

Settling Time to Full Accuracy

Frequency (Hz)	Settling Time (seconds)
<20	7
120 to 120 k	5
>120 k	2

Notes:

Plus 1 second for amplitude or frequency range change

Plus 2 seconds for 5700A/5720A 1100 V range

Plus 4 seconds for 5725A 1100 V range

Overshoot ..... <10 %

Common Mode Rejection ..... 140 dB, DC to 400 Hz

Frequency

Ranges (Hz) ..... 10.000 to 119.99
0.1200 k to 1.1999 k
1.200 k to 11.999 k
12.00 k to 119.99 k
120.0 k to 1.1999 M

Uncertainty ..... ±0.01 %

Resolution ..... 11.999 counts

Phase Lock (Selectable Rear Panel BNC Input)

Phase Uncertainty (except 1100 V range) ..... >30 Hz: ±1 ° + 0.05 °/kHz), <30 Hz: ±3 °

Input Voltage ..... 1 V to 10 V rms sine wave (do not exceed 1 V for mV ranges)

Frequency Range ..... 10 Hz to 1.1999 MHz

Lock Range ..... ±2 % of frequency

Lock-In Time ..... Larger of 10/frequency or 10 msec

Phase Reference (Selectable Rear Panel BNC Output)

Range ..... ±180 °

Phase Uncertainty (except 1100 V range) ..... ±1 ° at quadrature points (0 °, ±90 °, ±180 °) elsewhere ±2 °

Stability ..... ±0.1 °

Resolution ..... 1 °

Output Level ..... 2.5 V rms ±0.2 V

Frequency Range ..... 50 kHz to 1 kHz, usable 10 Hz to 1.1999 MHz

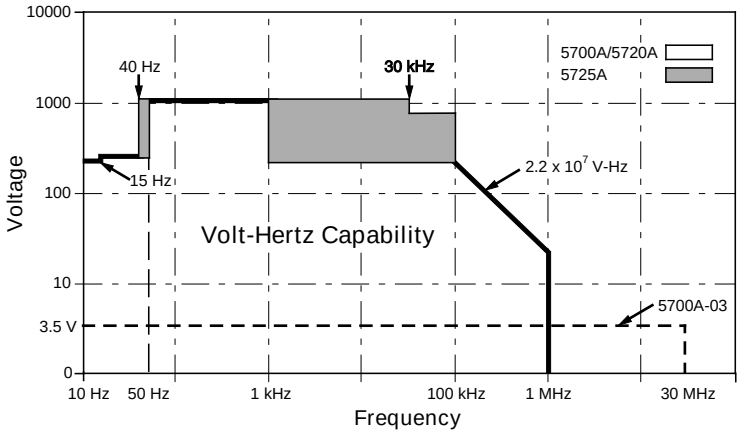

Figure A.

Resistance Specifications

5720A Series II Resistance Specifications

Nominal Value (Ω)	Absolute Uncertainty of Characterized Value ± 5 °C from calibration temperature [1]				Relative Uncertainty ± 1 °C	
	24 Hours	90 Days	180 Days	1 Year	24 Hours	90 Days
	±ppm					
99 % Confidence Level						
0	50 µΩ	50 µΩ	50 µΩ	50 µΩ	50 µΩ	50 µΩ
1	85	95	100	110	32	40
1.9	85	95	100	110	25	33
10	23	25	26	27	5	8
19	23	25	26	27	4	7
100	10	11	11.5	12	2	4
190	10	11	11.5	12	2	4
1 k	8	9	9.5	10	2	3
1.9 k	8	9	9.5	10	2	3
10 k	8	9	9.5	10	2	3
19 k	9	9	9.5	10	2	3
100 k	9	11	12	13	2	3
190 k	9	11	12	13	2	3
1 M	16	18	20	23	2.5	5
1.9 M	17	19	21	24	3	6
10 M	33	37	40	46	10	14
19 M	43	47	50	55	20	24
100 M	100	110	115	120	50	60
95 % Confidence Level						
0	40 µΩ	40 µΩ	40 µΩ	40 µΩ	40 µΩ	40 µΩ
1	70	80	85	95	27	35
1.9	70	80	85	95	20	26
10	20	21	22	23	4	7
19	20	21	22	23	3.5	6
100	8	9	9.5	10	1.6	3.5
190	8	9	9.5	10	1.6	3.5
1 k	6.5	7.5	8	8.5	1.6	2.5
1.9 k	6.5	7.5	8	8.5	1.6	2.5
10 k	6.5	7.5	8	8.5	1.6	2.5
19 k	7.5	7.5	8	8.5	1.6	2.5
100 k	7.5	9	10	11	1.6	2.5
190 k	7.5	9	10	11	1.6	2.5
1 M	13	15	17	20	2	4
1.9 M	14	16	18	21	2.5	4
10 M	27	31	34	40	8	12
19 M	35	39	42	47	16	20
100 M	85	95	100	100	40	50

Note:

1. Specifications apply to displayed value. 4-wire connections, except 100 MΩ.

5700A Series II Resistance Specifications

Nominal Value (Ω)	Absolute Uncertainty of Characterized Value ± 5 °C from calibration temperature [1]				Relative Uncertainty ± 1 °C	
	24 Hours	90 Days	180 Days	1 Year	24 Hours	90 Days
	±ppm					
99 % Confidence Level						
0	50 μΩ	50 μΩ	50 μΩ	50 μΩ	50 μΩ	50 μΩ
1	85	95	100	110	32	40
1.9	85	95	100	110	25	33
10	26	28	30	33	5	8
19	24	26	28	31	4	7
100	15	17	18	20	2	4
190	15	17	18	20	2	4
1 k	11	12	13	15	2	3.5
1.9 k	11	12	13	15	2	3.5
10 k	9	11	12	14	2	3.5
19 k	9	11	12	14	2	3.5
100 k	11	13	14	16	2	3.5
190 k	11	13	14	16	2	3.5
1 M	16	18	20	23	2.5	5
1.9 M	17	19	21	24	3.5	6
10 M	33	37	40	46	10	14
19 M	43	47	50	55	20	24
100 M	110	120	125	130	50	60
95 % Confidence Level						
0	50 μΩ	50 μΩ	50 μΩ	50 μΩ	50 μΩ	50 μΩ
1	70	80	85	95	32	40
1.9	70	80	85	95	25	33
10	21	23	27	28	5	8
19	20	22	24	27	4	7
100	13	14	15	17	2	4
190	13	14	15	17	2	4
1 k	9	10	11	13	2	3.5
1.9 k	9	10	11	13	2	3.5
10 k	7.5	9.5	10.5	12	2	3.5
19 k	7.5	9.5	10.5	12	2	3.5
100 k	9	11	12	14	2	3.5
190 k	9	11	12	14	2	3.5
1 M	13	15	17	20	2.5	5
1.9 M	14	16	18	21	3	6
10 M	27	31	34	40	10	14
19 M	35	39	42	47	20	24
100 M	90	100	105	110	50	60

Note:

1. Specifications apply to displayed value. 4-wire connections, except 100 MΩ.

Resistance Secondary Performance Specifications and Operating Characteristics

Nominal Value (Ω)	Stability ± 1 °C [1] 24 Hours	Temperature Coefficient Adder [2]		Full Spec Load Range [3] I_L - I_U (mA)	Maximum Peak Current I_{MAX} (mA)	Maximum Difference of Characterized to Nominal Value	Two-Wire Adder Active Compensation [4]	
		10 °C to 40 °C	0 °C to 10 °C and 40 °C to 50 °C				Lead Resistance	
							0.1 Ω	1 Ω
	±ppm	±ppm/°C				±ppm	±mΩ	
0	—	—	—	8 to 500	500	—	$2 + \frac{4\mu V}{I_m}$	$4 + \frac{4\mu V}{I_m}$
1	32	4	5	8 to 100	700	500	$2 + \frac{4\mu V}{I_m}$	$4 + \frac{4\mu V}{I_m}$
1.9	25	6	7	8 to 100	500	500	$2 + \frac{4\mu V}{I_m}$	$4 + \frac{4\mu V}{I_m}$
10	5	2	3	8 to 11	220	300	$2 + \frac{4\mu V}{I_m}$	$4 + \frac{4\mu V}{I_m}$
19	4	2	3	8 to 11	160	300	$2 + \frac{4\mu V}{I_m}$	$4 + \frac{4\mu V}{I_m}$
100	2	2	3	8 to 11	70	150	$2 + \frac{4\mu V}{I_m}$	$4 + \frac{4\mu V}{I_m}$
190	2	2	3	8 to 11	50	150	$2 + \frac{4\mu V}{I_m}$	$4 + \frac{4\mu V}{I_m}$
1 k	2	2	3	1 to 2	22	150	10	15
1.9 k	2	2	3	1 to 1.5	16	150	10	15
10 k	2	2	3	100 to 500 μA	7	150	50	60
19 k	2	2	3	50 to 250 μA	5	150	100	120
100 k	2	2	3	10 to 100 μA	1	150	I_m= Current produced by Ohmmeter (A)	
190 k	2	2	3	5 to 50 μA	500 μA	150		
1 M	2.5	2.5	6	5 to 20 μA	100 μA	200		
1.9 M	3.5	3	10	2.5 to 10 μA	50 μA	200		
10 M	10	5	20	0.5 to 2 μA	10 μA	300		
19 M	20	8	40	0.25 to 1 μA	5 μA	300		
100 M	50	12	100	50 to 200 nA	1 μA	500		

Notes:

1. Stability specifications are included in the Absolute Uncertainty values in the primary specification tables.
2. Temperature coefficient is an adder to uncertainty specifications that does not apply unless operated more than 5 °C from calibration temperature, or calibrated outside the range 19 °C to 24 °C. Two examples:

   - Calibrate at 20 °C: Temperature coefficient adder is not required unless operated below 15 °C or above 25 °C.

   - Calibrate at 26 °C: Add 2 °C temperature coefficient adder. Additional temperature coefficient adder is not required unless operated below 21 °C or above 31 °C.
3. Refer to current derating factors table for loads outside of this range.
4. Active two-wire compensation may be selected for values less than 100 kΩ, with either the front panel or the meter input terminals as reference plane. Active compensation is limited to 11 mA load, and to 2 V burden. Two-wire compensation can be used only with Ω-meters that source continuous (not pulsed) dc current.

Current Derating Factors

Nominal Value (Ω)	Value of Derating Factor K for Over or Under Current		
	Two-Wire Comp $I < I_L$ [1]	Four-Wire $I < I_L$ [1]	Four-Wire $I_U < I < I_{MAX}$ [2]
SHORT	4.4	0.3	—
1	4.4	300	4×10^{-5}
1.9	4.4	160	1.5×10^{-4}
10	4.4	30	1.6×10^{-3}
19	4.4	16	3×10^{-3}
100	4.4	3.5	1×10^{-2}
190	4.4	2.5	1.9×10^{-2}
1 k	4.4	0.4	0.1
1.9 k	4.4	0.4	0.19
10 k	5000	50	2.0
19 k	5000	50	3.8
100 k	—	7.5	2×10^{-5}
190 k	—	4.0	3.8×10^{-5}
1 M	—	1.0	1.5×10^{-4}
1.9 M	—	0.53	2.9×10^{-4}
10 M	—	0.2	1×10^{-3}
19 M	—	0.53	1.9×10^{-3}
100 M		0.1	—

Notes:

1. For $I < I_L$, errors occur due to thermally generated voltages within the 5720A. Use the following equation to determine the error, and add this error to the corresponding uncertainty or stability specification.

   Error = $K(I_L - I)/(I_L \times I)$

   Where: Error is in mΩ for all two-wire comp values and four-wire short, and in ppm for the remaining four-wire values.

   K is the constant from the above table;
   I and I_L are expressed in mA for short to 1.9 kΩ;
   I and I_L are expressed in □μA for 10 kΩ to 100 MΩ

2. For $I_U < I < I_{MAX}$ errors occur due to self-heating of the resistors in the calibrator. Use the following equation to determine the error in ppm and add this error to the corresponding uncertainty or stability specification.

   Error in ppm = $K(I^2-I_U^2)$

   Where: K is the constant from the above table;
   I and I_U are expressed in mA for short to 19 kΩ;
   I and I_U are expressed in μA for 100 kΩ to 100 MΩ

DC Current Specifications

5720A Series II DC Current Specifications

Range	Resolution	Absolute Uncertainty ± 5 °C from calibration temperature [2][3]				Relative Uncertainty ± 1 °C	
		24 Hours	90 Days	180 Days	1 Year	24 Hours	90 Days
	nA	± (ppm output + nA)					
99 % Confidence Level							
220 µA	0.1	40 + 7	42 + 7	45 + 7	50 + 7	24 + 2	26 + 2
2.2 mA	1	30 + 8	35 + 8	37 + 8	40 + 8	24 + 5	26 + 5
22 mA	10	30 + 50	35 + 50	37 + 50	40 + 50	24 + 50	26 + 50
	µA	± (ppm output + µA)					
220 mA [1]	0.1	40 + 0.8	45 + 0.8	47 + 0.8	50 + 0.8	26 + 0.3	30 + 0.3
2.2 A [1]	1	60 + 15	70 + 15	80 + 15	90 + 15	40 + 7	45 + 7
5725A Amplifier:							
11 A	10	330 + 470	340 + 480	350 + 480	360 + 480	100 + 130	110 + 130
95 % Confidence Level							
	nA	± (ppm output + nA)					
220 µA	0.1	32 + 6	35 + 6	37 + 6	40 + 6	20 + 1.6	22 + 1.6
2.2 mA	1	25 + 7	30 + 7	33 + 7	35 + 7	20 + 4	22 + 4
22 mA	10	25 + 40	30 + 40	33 + 40	35 + 40	20 + 40	22 + 40
	µA	± (ppm output + µA)					
220 mA [1]	0.1	35 + 0.7	40 + 0.7	42 + 0.7	45 + 0.7	22 + 0.25	25 + 0.25
2.2 A [1]	1	50 + 12	60 + 12	70 + 12	80 + 12	32 + 6	40 + 6
5725A Amplifier:							
11 A	10	330 + 470	340 + 480	350 + 480	360 + 480	100 + 130	110 + 130

Note:

Maximum output from the calibrator's terminals is 2.2 A. Uncertainty specifications for 220 µA and 2.2 mA ranges are increased by a factor of 1.3 when supplied through 5725A terminals.

Specifications are otherwise identical for all output locations.

1. Add to uncertainty specifications:

   ±200 x I^2 ppm for >100 mA on 220 mA range
   ±10 x I^2 ppm for >1 A on 2.2 A range

2. For fields strengths >0.4 V/m but ≤3 V/m, in the band of 80 MHz to 1 GHz, add 1 % of range.

3. For conducted immunity levels >=1 V in the band of 150 kHz to 80 MHz on 2.2 mA range, add 0.01 % of range.

5700A Series II DC Current Specifications

Range	Resolution	Absolute Uncertainty ± 5 °C from calibration temperature [2][3]				Relative Uncertainty ± 1 °C	
		24 Hours	90 Days	180 Days	1 Year	24 Hours	90 Days
	nA	± (ppm output + nA)					
99 % Confidence Level							
220 μA	0.1	45 + 10	50 + 10	55 + 10	60 + 10	24 + 2	26 + 2
2.2 mA	1	45 + 10	50 + 10	55 + 10	60 + 10	24 + 5	26 + 5
22 mA	10	45 + 100	50 + 100	55 + 100	60 + 100	24 + 50	26 + 50
	μA	± (ppm output + μA)					
220 mA [1]	0.1	55 + 1	60 + 1	65 + 1	70 + 1	26 + 0.3	30 + 0.3
2.2 A [1]	1	75 + 30	80 + 30	90 + 30	95 + 30	40 + 7	45 + 7
5725A Amplifier:							
11 A	10	330 + 470	340 + 480	350 + 480	360 + 480	100 + 130	110 + 130
95 % Confidence Level							
	nA	± (ppm output + nA)					
220 μA	0.1	35 + 8	40 + 8	45 + 8	50 + 8	20 + 1.6	22 + 1.6
2.2 mA	1	35 + 8	40 + 8	45 + 8	50 + 8	20 + 4	22 + 4
22 mA	10	35 + 80	40 + 80	45 + 80	50 + 80	20 + 40	22 + 40
	μA	± (ppm output + μA)					
220 mA [1]	0.1	45 + 0.8	50 + 0.8	55 + 0.8	60 + 0.8	22 + 0.25	25 + 0.25
2.2 A [1]	1	60 + 25	65 + 25	75 + 25	80 + 25	35 + 6	40 + 6
5725A Amplifier:							
11 A	10	330 + 470	340 + 480	350 + 480	360 + 480	100 + 130	110 + 130

Note:

Maximum output from the calibrator's terminals is 2.2 A. Uncertainty specifications for 220 μA and 2.2 mA ranges are increased by a factor of 1.3 when supplied through 5725A terminals.

Specifications are otherwise identical for all output locations.

1. Add to uncertainty specifications:

   $\pm 200 \times I^2$ ppm for >100 mA on 220 mA range
   $\pm 10 \times I^2$ ppm for >1 A on 2.2 A range

2. For fields strengths >0.4 V/m but ≤3 V/m, in the band of 80 MHz to 1 GHz, add 1 % of range.

3. For conducted immunity levels >=1 V in the band of 150 kHz to 80 MHz on 2.2 mA range, add 0.01 % of range.

DC Current Secondary Performance Specifications and Operating Characteristics

Range	Stability ± 1 °C [1] 24 Hours	Temperature Coefficient [2]		Compliance Limits	Burden Voltage Adder [3] (±nA/V)	Maximum Load for Full Accuracy [4] (Ω)	Noise	
		10 °C to 40 °C	0 °C to 10 °C and 40 °C to 50 °C				Bandwidth 0.1Hz to 10 Hz	Bandwidth 10 Hz to 10 kHz
							pk-pk	RMS
	± (ppm output + nA)	± (ppm output + nA) / °C					ppm output + nA	nA
220 μA	5 + 1	1 + 0.40	3 + 1	10	0.2	20k	6 + .9	10
2.2 mA	5 + 5	1 + 2	3 + 10	10	0.2	2k	6 + 5	10
22 mA	5 + 50	1 + 20	3 + 100	10	10	200	6 + 50	50
220 mA	8 + 300	1 + 200	3 + 1 μA	10	100	20	9 + 300	500
2.2 A	9 + 7 μA	1 + 2.5 μA	3 + 10 μA	3 [5]	2 μA	2	12 + 1.5 μA	20 μA
5725A	**± (ppm output + μA)**	**± (ppm output + μA) / °C**					**ppm output + μA**	**μA**
11 A	25 + 100	20 + 75	30 + 120	4	0	4	15 + 70	175

Notes:

Maximum output from the calibrator's terminals is 2.2 A. Uncertainty specifications for 220 μA and 2.2 mA ranges are increased by a factor of 1.3 when supplied through 5725A terminals.

1. Stability specifications are included in the Absolute Uncertainty values for the primary specifications.
2. Temperature coefficient is an adder to uncertainty specifications. It does not apply unless operating more than ±5 °C from calibration temperature.
3. Burden voltage adder is an adder to uncertainty specifications that does not apply unless burden voltage is greater than 0.5 V.
4. For higher loads, multiply uncertainty specification by: $1+\frac{0.1 \times \text{actual load}}{\text{maximum load for full accuracy}}$
5. The calibrator's compliance limit is 2 V for outputs from 1 A to 2.2 A. 5725A Amplifier may be used in range-lock mode down to 0 A.

Minimum Output: .....0 for all ranges, including 5725A.

Settling Time: .....1 second for μA and mA ranges; 3 seconds for 2.2 A range; 6 seconds for 11 A range; + 1 second for range or polarity change

Overshoot: .....<5 %

AC Current Specifications

5720A Series II AC Current Specifications: 99 % Confidence Level

Range	Resolution	Frequency (Hz)	Absolute Uncertainty ± 5 °C from calibration temperature [1]				Relative Uncertainty ± 1 °C	
			24 Hours	90 Days	180 Days	1 Year	24 Hours	90 Days
			± (ppm output + nA)					
220 µA	1 nA	10 to 20	260 + 20	280 + 20	290 + 20	300 + 20	260 + 20	280 + 20
		20 to 40	170 + 12	180 + 12	190 + 12	200 + 12	130 + 12	150 + 12
		40 to 1 k	120 + 10	130 + 10	135 + 10	140 + 10	100 + 10	110 + 10
		1k to 5 k	300 + 15	320 + 15	340 + 15	350 + 15	250 + 15	280 + 15
		5k to 10 k	1000 + 80	1100 + 80	1200 + 80	1300 + 80	900 + 80	1000 + 80
2.2 mA	10 nA	10 to 20	260 + 50	280 + 50	290 + 50	300 + 50	260 + 50	280 + 50
		20 to 40	170 + 40	180 + 40	190 + 40	200 + 40	130 + 40	150 + 40
		40 to 1 k	120 + 40	130 + 40	135 + 40	140 + 40	100 + 40	110 + 40
		1k to 5 k	210 + 130	220 + 130	230 + 130	240 + 130	190 + 130	220 + 130
		5k to 10 k	1000 + 800	1100 + 800	1200 + 800	1300 + 800	900 + 800	1000 + 800
22 mA	100 nA	10 to 20	260 + 500	280 + 500	290 + 500	300 + 500	260 + 500	280 + 500
		20 to 40	170 + 400	180 + 400	190 + 400	200 + 400	130 + 400	150 + 400
		40 to 1 k	120 + 400	130 + 400	135 + 400	140 + 400	100 + 400	110 + 400
		1k to 5 k	210 + 700	220 + 700	230 + 700	240 + 700	190 + 700	220 + 700
		5k to 10 k	1000 + 6000	1100 + 6000	1200 + 6000	1300 + 6000	900 + 6000	1000 + 6000
			± (ppm output + µA)					
220 mA	1 µA	10 to 20	260 + 5	280 + 5	290 + 5	300 + 5	260 + 5	280 + 5
		20 to 40	170 + 4	180 + 4	190 + 4	200 + 4	130 + 4	150 + 4
		40 to 1 k	120 + 3	130 + 3	135 + 3	140 + 3	100 + 3	110 + 3
		1k to 5 k	210 + 4	220 + 4	230 + 4	240 + 4	190 + 4	220 + 4
		5k to 10 k	1000 + 12	1100 + 12	1200 + 12	1300 + 12	900 + 12	1000 + 12
2.2 A	10 µA	20 to 1 k	290 + 40	300 + 40	310 + 40	320 + 40	260 + 40	280 + 40
		1 k to 5 k	440 + 100	460 + 100	480 + 100	500 + 100	420 + 100	440 + 100
		5 k to 10 k	6000 + 200	7000 + 200	7500 + 200	8000 + 200	6000 + 200	7000 + 200
5725A Amplifier:								
11 A	100 µA	40 to 1 k	370 + 170	400 + 170	440 + 170	460 + 170	300 + 170	330 + 170
		1 k to 5 k	800 + 380	850 + 380	900 + 380	950 + 380	700 + 380	800 + 380
		5 k to 10 k	3000 + 750	3300 + 750	3500 + 750	3600 + 750	2800 + 750	3200 + 750

Note:

Maximum output from the calibrator's terminals is 2.2 A. Uncertainty specifications for 220 µA and 2.2 mA ranges are increased by a factor of 1.3 plus 2 µA when supplied through 5725A terminals. For the 5720A 220 µA range, 1 kHz through 5 kHz and 5 kHz through 10 kHz, when the output is coming from the AUX current terminal, use the 5700A Absolute Uncertainty Specifications. Specifications are otherwise identical for all output locations.

1. For fields strengths >0.4 V/m but ≤3 V/m, in the band of 80 MHz to 1 GHz, add 1 % of range.

5720A Series II AC Current Specifications: 95% Confidence Level

Range	Resolution	Frequency (Hz)	Absolute Uncertainty ± 5 °C from calibration temperature [1]				Relative Uncertainty ± 1 °C	
			24 Hours	90 Days	180 Days	1 Year	24 Hours	90 Days
			± (ppm output + nA)					
220 μA	1 nA	10 to 20	210 + 16	230 + 16	240 + 16	250 + 16	210 + 16	230 + 16
		20 to 40	130 + 10	140 + 10	150 + 10	160 + 10	110 + 10	130 + 10
		40 to 1 k	100 + 8	110 + 8	115 + 8	120 + 8	80 + 8	90 + 8
		1k to 5 k	240 + 12	250 + 12	270 + 12	280 + 12	200 + 12	230 + 12
		5k to 10 k	800 + 65	900 + 65	1000 + 65	1100 + 65	700 + 65	800 + 65
2.2 mA	10 nA	10 to 20	210 + 40	230 + 40	240 + 40	250 + 40	210 + 40	230 + 40
		20 to 40	130 + 35	140 + 35	150 + 35	160 + 35	110 + 35	130 + 35
		40 to 1 k	100 + 35	110 + 35	115 + 35	120 + 35	80 + 35	90 + 35
		1k to 5 k	170 + 110	180 + 110	190 + 110	200 + 110	160 + 110	170 + 110
		5k to 10 k	800 + 650	900 + 650	1000 + 650	1100 + 650	700 + 650	800 + 650
22 mA	100 nA	10 to 20	210 + 400	230 + 400	240 + 400	250 + 400	210 + 400	230 + 400
		20 to 40	130 + 350	140 + 350	150 + 350	160 + 350	110 + 350	130 + 350
		40 to 1 k	100 + 350	110 + 350	115 + 350	120 + 350	80 + 350	90 + 350
		1k to 5 k	170 + 550	180 + 550	190 + 550	200 + 550	160 + 550	170 + 550
		5k to 10 k	800 + 5000	900 + 5000	1000 + 5000	1100 + 5000	700 + 5000	800 + 5000
			± (ppm output + μA)					
220 mA	1 μA	10 to 20	210 + 4	230 + 4	240 + 4	250 + 4	210 + 4	230 + 4
		20 to 40	130 + 3.5	140 + 3.5	150 + 3.5	160 + 3.5	110 + 3.5	130 + 3.5
		40 to 1 k	100 + 2.5	110 + 2.5	115 + 2.5	120 + 2.5	80 + 2.5	90 + 2.5
		1k to 5 k	170 + 3.5	180 + 3.5	190 + 3.5	200 + 3.5	160 + 3.5	170 + 3.5
		5k to 10 k	800 + 10	900 + 10	1000 + 10	1100 + 10	700 + 10	800 + 10
2.2 A	10 μA	20 to 1 k	230 + 35	240 + 35	250 + 35	260 + 35	200 + 35	230 + 35
		1 k to 5 k	350 + 80	390 + 80	420 + 80	450 + 80	300 + 80	350 + 80
		5 k to 10 k	5000 + 160	6000 + 160	6500 + 160	7000 + 160	5000 + 160	6000 + 160
5725A Amplifier:								
11 A	100 μA	40 to 1 k	370 + 170	400 + 170	440 + 170	460 + 170	300 + 170	330 + 170
		1 k to 5 k	800 + 380	850 + 380	900 + 380	950 + 380	700 + 380	800 + 38
		5 k to 10 k	3000 + 750	3300 + 750	3500 + 750	3600 + 750	2800 + 750	3200 + 750

Note:

Maximum output from the calibrator's terminals is 2.2 A. Uncertainty specifications for 220 μA and 2.2 mA ranges are increased by 1.3 plus 2 μA when supplied through 5725A terminals. For the 5720A 220 μA range, 1 kHz through 5 kHz and 5 kHz through 10 kHz, when the output is coming from the AUX current terminal, use the 5700A Absolute Uncertainty Specifications. Specifications are otherwise identical for all output locations.

1. For fields strengths >0.4 V/m but ≤3 V/m, in the band of 80 MHz to 1 GHz, add 1 % of range.

5700A Series II AC Current Specifications: 99 % Confidence Level

Range	Resolution	Frequency (Hz)	Absolute Uncertainty ± 5 °C from calibration temperature[1]				Relative Uncertainty ± 1 °C	
			24 Hours	90 Days	180 Days	1 Year	24 Hours	90 Days
			± (ppm output + nA)					
220 μA	1 nA	10 to 20	650 + 30	700 + 30	750 + 30	800 + 30	450 + 30	500 + 30
		20 to 40	350 + 25	380 + 25	410 + 25	420 + 25	270 + 25	300 + 25
		40 to 1 k	120 + 20	140 + 20	150 + 20	160 + 20	110 + 20	120 + 20
		1k to 5 k	500 + 50	600 + 50	650 + 50	700 + 50	450 + 50	500 + 50
		5k to 10 k	1500 + 100	1600 + 100	1700 + 100	1800 + 100	1400 + 100	1500 + 100
2.2 mA	10 nA	10 to 20	650 + 50	700 + 50	750 + 50	800 + 50	450 + 50	500 + 50
		20 to 40	350 + 40	380 + 40	410 + 40	420 + 40	270 + 40	300 + 40
		40 to 1 k	120 + 40	140 + 40	150 + 40	160 + 40	110 + 40	120 + 40
		1k to 5 k	500 + 500	600 + 500	650 + 500	700 + 500	450 + 500	500 + 500
		5k to 10 k	1500 + 1000	1600 + 1000	1700 + 1000	1800 + 1000	1400 + 1000	1500 + 1000
22 mA	100 nA	10 to 20	650 + 500	700 + 500	750 + 500	800 + 500	450 + 500	500 + 500
		20 to 40	350 + 400	380 + 400	410 + 400	420 + 400	270 + 400	300 + 400
		40 to 1 k	120 + 400	140 + 400	150 + 400	160 + 400	110 + 400	120 + 400
		1k to 5 k	500 + 5000	600 + 5000	650 + 5000	700 + 5000	450 + 5000	500 + 5000
		5k to 10 k	1500 + 10,000	1600 + 10,000	1700 + 10,000	1800 + 10,000	1400 + 10,000	1500 + 10,000
			± (ppm output + μA)					
220 mA	1 μA	10 to 20	650 + 5	700 + 5	750 + 5	800 + 5	450 + 5	500 + 5
		20 to 40	350 + 4	380 + 4	410 + 4	420 + 4	280 + 4	300 + 4
		40 to 1 k	120 + 4	150 + 4	170 + 4	180 + 4	110 + 4	130 + 4
		1k to 5 k	500 + 50	600 + 50	650 + 50	700 + 50	450 + 50	500 + 50
		5k to 10 k	1500 + 100	1600 + 100	1700 + 100	1800 + 100	1400 + 100	1500 + 100
2.2 A	10 μA	20 to 1 k	600 + 40	650 + 40	700 + 40	750 + 40	600 + 40	650 + 40
		1 k to 5 k	700 + 100	750 + 100	800 + 100	850 + 100	650 + 100	750 + 100
		5 k to 10 k	8000 + 200	9000 + 200	9500 + 200	10,000 + 200	7500 + 200	8500 + 200
5725A Amplifier:								
11 A	100 μA	40 to 1 k	370 + 170	400 + 170	440 + 170	460 + 170	300 + 170	330 + 170
		1 k to 5 k	800 + 380	850 + 380	900 + 380	950 + 380	700 + 380	800 + 380
		5 k to 10 k	3000 + 750	3300 + 750	3500 + 750	3600 + 750	2800 + 750	3200 + 750

Note:

Maximum output from the calibrator's terminals is 2.2 A. Uncertainty specifications for 220 μA and 2.2 mA ranges are increased by a factor of 1.3 plus 2 μA when supplied through 5725A terminals. Specifications are otherwise identical for all output locations.

1. For field strengths >0.4 V/m but ≤3 V/m, in the band of 80 MHz to 1 GHz, add 1 % of range.

5700A Series II AC Current Specifications: 95 % Confidence Level

Range	Resolution	Frequency (Hz)	Absolute Uncertainty ± 5 °C from calibration temperature [1]				Relative Uncertainty ± 1 °C	
			24 Hours	90 Days	180 Days	1 Year	24 Hours	90 Days
			± (ppm output + nA)					
220 μA	1 nA	10 to 20	550 + 25	600 + 25	650 + 25	700 + 25	375 + 25	400 + 25
		20 to 40	280 + 20	310 + 20	330 + 20	350 + 20	220 + 20	250 + 20
		40 to 1 k	100 + 16	120 + 16	130 + 16	140 + 16	90 + 16	100 + 16
		1k to 5 k	400 + 40	500 + 40	550 + 40	600 + 40	375 + 40	400 + 40
		5k to 10 k	1300 + 80	1400 + 80	1500 + 80	1600 + 80	1200 + 80	1200 +80
2.2 mA	10 nA	10 to 20	550 + 40	600 + 40	650 + 40	700 + 40	375 + 40	400 + 40
		20 to 40	280 + 35	310 + 35	330 + 35	350 + 35	220 + 35	250 + 35
		40 to 1 k	100 + 35	120 + 35	130 + 35	140 + 35	090 + 35	100 + 35
		1k to 5 k	400 + 400	500 + 400	550 + 400	600 + 400	375 + 400	400 + 400
		5k to 10 k	1300 + 800	1400 + 800	1500 + 800	1600 + 800	1200 + 800	1200 + 800
22 mA	100 nA	10 to 20	550 + 400	600 + 400	650 + 400	700 + 400	375 + 400	400 + 400
		20 to 40	280 + 350	310 + 350	330 + 350	350 + 350	220 + 350	250 + 350
		40 to 1 k	100 + 350	120 + 350	130 + 350	140 + 350	090 + 350	100 + 350
		1k to 5 k	400 + 4000	500 + 4000	550 + 4000	600 + 4000	375 + 4000	400 + 4000
		5k to 10 k	1300 + 8000	1400 + 8000	1500 + 8000	1600 + 8000	1200 + 8000	1200 + 8000
			± (ppm output + μA)					
220 mA	1 μA	10 to 20	550 + 4	600 + 4	650 + 4	700 + 4	375 + 4	400 + 4
		20 to 40	280 + 3.5	310 + 3.5	330 + 3.5	350 + 3.5	220 + 3.5	250 + 3.5
		40 to 1 k	100 + 3.5	120 + 3.5	130 + 3.5	140 + 3.5	90 + 3.5	100 + 3.5
		1k to 5 k	400 + 40	500 + 40	550 + 40	600 + 40	375 + 40	400 + 40
		5k to 10 k	1300 + 80	1400 + 80	1500 + 80	1600 + 80	1200 + 80	1200 + 80
2.2 A	10 μA	20 to 1 k	500 + 35	550 + 35	600 + 35	650 + 35	500 + 35	550 + 35
		1 k to 5 k	600 + 80	650 + 80	700 + 80	750 + 80	550 + 80	650 + 80
		5 k to 10 k	6500 + 160	7500 + 160	8000 + 1600	8500 + 160	6000 + 160	7000 + 160
5725A Amplifier:								
11 A	100 μA	40 to 1 k	370 + 170	400 + 170	440 + 170	460 + 170	300 + 170	330 + 170
		1 k to 5 k	800 + 380	850 + 380	900 + 380	950 + 380	700 + 380	800 + 380
		5 k to 10 k	3000 + 750	3300 + 750	3500 + 750	3600 + 750	2800 + 750	3200 + 750

Note:

Maximum output from the calibrator's terminals is 2.2 A. Uncertainty specifications for 220μA and 2.2 mA ranges are increased by a factor of 1.3 plus 2 μA when supplied through 5725A terminals. Specifications are otherwise identical for all output locations.

1. For fields strengths >0.4 V/m but ≤3 V/m, in the band of 80 MHz to 1 GHz, add 1 % of range.

AC Current Secondary Performance Specifications and Operating Characteristics

Range	Frequency (Hz)	Stability ± 1 °C [1] 24 Hours	Temperature Coefficient [2]		Compliance Limits (V rms)	Maximum Resistive Load For Full Accuracy [3] (Ω)	Noise and Distortion (Bandwidth 10 Hz to 50 kHz <0.5V Burden)
			10 °C to 40 °C	0 °C to 10 °C and 40 °C to 50 °C			
		± (ppm output + nA)	± (ppm output + nA)/°C				± (% output + μA)
	10 to 20	150 + 5	50 + 5	50 + 5	7	2 k [6]	0.05 + 0.1
	20 to 40	80 + 5	20 + 5	20 + 5			0.05 + 0.1
220 μA	40 to 1 k	30 + 3	4 + 0.5	10 + 0.5			0.05 + 0.1
	1 k to 5 k	50 + 20	10 + 1	20 + 1			0.25 + 0.5
	5 k to 10 k	400 + 100	20 + 100	20 + 100			00.5 + 1
	10 to 20	150 + 5	50 + 5	50 + 5	7	500	0.05 + 0.1
	20 to 40	80 + 5	20 + 4	20 + 4			0.05 + 0.1
2.2 mA	40 to 1 k	30 + 3	4 + 1	10 + 2			0.05 + 0.1
	1 k to 5 k	50 + 20	10 + 100	20 + 100			0.25 + 0.5
	5 k to 10 k	400 + 100	50 + 400	50 + 400			00.5 + 1
	10 to 20	150 + 50	50 + 10	50 + 10	7	80	0.05 + 0.1
	20 to 40	80 + 50	20 + 10	20 + 10			0.05 + 0.1
22 mA	40 to 1 k	30 + 30	4 + 10	10 + 20			0.05 + 0.1
	1 k to 5 k	50 + 500	10 + 500	20 + 400			0.25 + 0.5
	5 k to 10 k	400 + 1000	50 + 1000	50 + 1000			00.5 + 1
	Hz	± (ppm output + μA)	± (ppm output + μA) / °C				
	10 to 20	150 + 0.5	50 + 0.05	50 + 0.05	7	8	0.05 + 10
	20 to 40	80 + 0.5	20 + 0.05	20 + 0.05			0.05 + 10
220 mA	40 to 1 k	30 + 0.3	4 + 0.1	10 + 0.1			0.05 + 10
	1 k to 5 k	50 + 3	10 + 2	20 + 2			0.25 + 50
	5 k to 10 k	400 + 5	50 + 5	50 + 5			00.5 + 100
	20 to 1 k	50 + 5	4 + 1	10 + 1	1.4 [4]	0.5	0.5 + 100
2.2 A	1 k to 5 k	80 + 20	10 + 5	20 + 5			0.3 + 500
	5 k to 10 k	800 + 50	50 + 10	50 + 10			0 1 + 1 mA
5725A Amplifier:							± (% output)
	40 to 1 k	75 + 100	20 + 75	30 + 75	3	3	0.05 [5]
11 A	1 k to 5 k	100 + 150	40 + 75	50 + 75			0.12 [5]
	5 k to 10 k	200 + 300	100 + 75	100 + 75			0.5 [5]

Notes:

Maximum output from 5720A terminals is 2.2 A. Uncertainty specifications for 220 μA and 2.2 mA ranges are increased by a factor of 1.3, plus 2 μA when supplied through 5725A terminals. Specifications are otherwise identical for all output locations.

1. Stability specifications are included in the Absolute Uncertainty values for the primary specifications.
2. Temperature coefficient is an adder to uncertainty specifications that does not apply unless operating more than ±5 °C from calibration temperature.
3. For larger resistive loads multiply uncertainty specifications by: $\left(\frac{\text{actual load}}{\text{maximum load for full accuracy}}\right)^2$
4. 1.5 V compliance limit above 1 A. 5725A Amplifier may be used in range-lock mode down to 1 A.
5. For resistive loads within rated compliance voltage limits.
6. For outputs from the Aux Current terminals, the maximum resistive load for full accuracy is 1 kΩ. For larger resistive loads, multiply the uncertainty as described in Note 3.

Minimum Output..... 9 μA for 220 μA range, 10 % on all other ranges. 1 A minimum for 5725A.

Inductive Load Limits..... 400 μH (5700A/5720A, or 5725A). 20 μH for 5700A/5720A output >1 A.

Power Factors ..... 5700A/5720A, 0.9 to 1; 5725A, 0.1 to 1. Subject to compliance voltage limits.

Frequency:

Range (Hz) ..... 10.000 to 11.999, 12.00 to 119.99, 120.0 to 1199.9, 1.200 k to 10.000 k

Uncertainty ..... ±0.01 %

Resolution ..... 11,999 counts

Settling Time..... 5 seconds for 5700A/5720A ranges; 6 seconds for 5725A 11 A range; +1 second for amplitude or frequency range change.

Overshoot ..... <10 %

Wideband AC Voltage (Option 5700-03) Specifications

Specifications apply to the end of the cable and 50 Ω termination used for calibration.

Range		Resolution	Absolute Uncertainty ± 5 °C from calibration temperature 30 Hz to 500 kHz			
			24 Hours	90 Days	180 Days	1 Year
Volts	dBm		± (% output + μV)			
1.1 mV	-46	10 nV	0.4 + 0.4	0.5 + 0.4	0.6 + 0.4	0.8 + 2
3.3 mV	-37	10 nV	0.4 + 1	0.45 + 1	0.5 + 1	0.7 + 3
11 mV	-26	100 nV	0.2 + 4	0.35 + 4	0.5 + 4	0.7 + 8
33 mV	-17	100 nV	0.2 + 10	0.3 + 10	0.45 + 10	0.6 + 16
110 mV	-6.2	1 μV	0.2 + 40	0.3 + 40	0.45 + 40	0.6 + 40
330 mV	+3.4	1 μV	0.2 + 100	0.25 + 100	0.35 + 100	0.5 + 100
1.1 V	+14	10 μV	0.2 + 400	0.25 + 400	0.35 + 400	0.5 + 400
3.5 V	+24	10 μV	0.15 + 500	0.2 + 500	0.3 + 500	0.4 + 500

Frequency (Hz)	Frequency Resolution (Hz)	Amplitude Flatness, 1 kHz Reference Voltage Range			Temperature Coefficient ± ppm/°C	Settling Time To Full Accuracy (Seconds)	Harmonic Distortion (dB)
		1.1 mV	3 mV	> 3 mV			
		± (% output + floor indicated)					
10 to 30	0.01	0.3	0.3	0.3	100	7	-40
30 to 120	0.01	0.1	0.1	0.1	100	7	-40
120 to 1.2 k	0.1	0.1	0.1	0.1	100	5	-40
1.2 k to 12 k	1	0.1	0.1	0.1	100	5	-40
12 k to 120 k	10	0.1	0.1	0.1	100	5	-40
120 k to 1.2 M	100	0.2 + 3 μV	0.1 + 3 μV	0.1 + 3 μV	100	5	-40
1.2 M to 2 M [1]	100 k	0.2 + 3 μV	0.1 + 3 μV	0.1 + 3 μV	100	0.5	-40
2 M to 10 M	100 k	0.4 + 3 μV	0.3 + 3 μV	0.2 + 3 μV	100	0.5	-40
10 M to 20 M	1 M	0.6 + 3 μV	0.5 + 3 μV	0.4 + 3 μV	150	0.5	-34
20 M to 30 M	1 M	1.5 + 15 μV	1.5 + 3 μV	1 + 3 μV	300	0.5	-34

Note:

[1] For output voltages < 50 % of full range in the 33 mV, 110 mV, 330 mV, 1.1 V, and 3.5 V ranges, add 0.1 % to the amplitude flatness specification.

Additional Operating Information:

dBm reference = 50 Ω

Range boundaries are at voltage points, dBm levels are approximate.

$dBm = 10 \log \left(\frac{Power}{1 mW} \right)$; 0.22361 V across 50 Ω = 1 mW or 0 dBm

Minimum Output ..... 300 μV (-57 dBm)
Frequency Uncertainty ..... ± 0.01 %
Frequency Resolution ..... 11,999 counts to 1.1999 MHz, 119 counts to 30 MHz
Overload Protection ..... A short circuit on the wideband output will not result in damage. After settling time, normal operation is restored upon removal.

Auxiliary Amplifier Specifications

For complete specifications, see the 5205A and 5220A Operators Manuals.

5205A (220V to 1100 V ac, 0 V to 1100 V dc)

Overshoot: <10 %

Distortion (bandwidth 10 Hz to 1 MHz):

10 Hz to 20 kHz ..... 0.07 %
20 kHz to 50 kHz ..... 0.2 %
50 kHz to 100 kHz ..... 0.25 %

Frequency (Hz)	90 Day Accuracy at 23 ± 5 °C ± (% output + % range)	Temperature Coefficient for 0 °C to 18 °C and 28 °C to 50 °C ± (ppm output + ppm range) / °C
0 dc	0.05 + 0.005	15 + 3
10 to 40	0.15 + 0.005	45 + 3
40 to 20 k	0.04 + 0.004	15 + 3
20 k to 50 k	0.08 + 0.006	50 + 10
50 k to 100 k	0.1 + 0.01	70 + 20

5220A (AC Current, 180-day specifications):

Accuracy:

20 Hz to 1 kHz ..... 0.07 % + 1 mA
1 kHz to 5 kHz ..... (0.07 % + 1 mA) x frequency in kHz

Temperature Coefficient (0 °C to 18 °C and 28 °C to 50 °C):

(0.003 % + 100 μA) / °C

Distortion (bandwidth 300 kHz):

20 Hz to 1 kHz ..... 0.1% + 1 mA
1 kHz to 5 kHz ..... (0.1% + 1 mA) x frequency in kHz

Note: 5700A/5720A combined with 5220A is not specified for inductive loads.

Change #2

On page 4-14, under When to Use External Sensing, add the following between the first and second paragraphs:

> For ACV, when calibrating digital multimeters with input impedance of 1 MΩ or greater, internal sense is more effective for all frequencies. See Figures 4-1 and 4-2 for recommended connections for both internal and external sense applications.