

FLUKE®

Calibration

5320A

Multifunction Electrical Tester Calibrator



Extended Specifications

Uncertainty and Maximum Ratings

Nominal Value	Deviation from Nominal Value	Absolute Uncertainty of Characterized Value (tcal ±5 °C)	Maximum Continuous Test Current ACrms or DC ^[1]	Maximum Short-term Test Current AC rms or DC ^[2]	Test Current Uncertainty
25 mΩ	±50 %	±5 mΩ	30 A	40 A	1.5 % + 0.7 A
50 mΩ	±50 %	±5 mΩ	28 A	40 A	1.5 % + 0.5 A
100 mΩ	±30 %	±5 mΩ	25 A	40 A	1.5 % + 0.35 A
330 mΩ	±20 %	±7 mΩ	14 A	40 A	1.5 % + 0.3 A
500 mΩ	±10 %	±8 mΩ	10 A	40 A	1.5 % + 0.2 A
1 Ω	±10 %	±10 mΩ	8 A	40 A	1.5 % + 150 mA
1.8 Ω	±10 %	±18 mΩ	6 A	30 A	1.5 % + 100 mA
5 Ω	±10 %	±30 mΩ	3.2 A	21 A	1.5 % + 70 mA
10 Ω	±10 %	±60 mΩ	2.0 A	15 A	1.5 % + 50 mA
18 Ω	±10 %	±100 mΩ	1.5 A	10 A	1.5 % + 30 mA
50 Ω	±10 %	±300 mΩ	0.8 A	5.0 A	1.5 % + 20 mA
100 Ω	±10 %	±500 mΩ	0.5 A	3.0 A	1.5 % + 10 mA
180 Ω	±10 %	±1 Ω	0.25 A	1.35 A	1.5 % + 5 mA
500 Ω	±10 %	±2.5 Ω	0.1 A	0.6 A	1.5 % + 3 mA
1 kΩ	±10 %	±5 Ω	0.05 A	0.3 A	1.5 % + 2 mA
1.8 kΩ	±10 %	±10 Ω	0.025 A	0.15 A	1.5 % + 2 mA

Notes:

- [1] Test currents up to 30 % of maximum continuous test current can be applied to the Calibrator with no time limitation. Test current between 30 % and 100 % of the maximum continuous test current can be applied to the Calibrator for a limited time. Minimum period of full current load is 45 seconds. The Calibrator calculates the allowed time period and when exceeded, the output connectors are disconnected.
- [2] Maximum short term test current is defined as the rms value of halfwave or fullwave test current flowing through the UUT. Maximum time of test is 200 ms. A time interval of 200 ms represents 10 full waves of power line voltage at 50 Hz and 12 full waves at 60 Hz.

Open Mode

- Nominal resistance>100 kΩ
- Maximum voltage50 V ac + dc rms
- Test voltage range.....0 to 50 V ac + dc rms
- Resolution.....1 V
- Uncertainty.....2 % + 2 V

Transfer Mode

Transfer Ground Bond Resistance Accuracy in mΩ

Transfer GBR (mΩ)	Marking on Display	UUT Test Current							
		30 A	28 A	25 A	20 A	14 A	10 A	8 A	3 A
50	0	±0.8 mΩ	±0.8 mΩ	±0.8 mΩ	±0.9 mΩ	±1.0 mΩ	±1.2 mΩ	±1.3 mΩ	±2.6 mΩ
80	R1	±0.9 mΩ	±1.0 mΩ	±1.0 mΩ	±1.0 mΩ	±1.2 mΩ	±1.4 mΩ	±1.5 mΩ	±2.9 mΩ
120	R2	-	±1.1 mΩ	±1.1 mΩ	±1.2 mΩ	±1.3 mΩ	±1.5 mΩ	±1.7 mΩ	±3.1 mΩ
170	R3	-	-	±1.4 mΩ	±1.4 mΩ	±1.6 mΩ	±1.8 mΩ	±2.0 mΩ	±3.6 mΩ
420	R4	-	-	-	-	±3.0 mΩ	±3.3 mΩ	±3.6 mΩ	±6.0 mΩ
550	R5	-	-	-	-	-	±4.1 mΩ	±4.4 mΩ	±7.2 mΩ

Maximum and Minimum Applicable Test Currents from the Ground Bond Resistance Meter

5320A Transfer GBR (mΩ)	UUT Minimum Test Current AC/DC (A)	UUT Maximum Test Current AC/DC (A)
50	3	30
80	3	30
120	3	28
170	3	25
420	3	14
550	3	10

Notes

- The minimum value of the indicated test current is 0.05 A.
- The transfer GBR indication as the main value on the display is shown when the test current is 3 A or greater.

Line/Loop Impedance Source

- Range.....25 mΩ to 1.8 kΩ
- Resolution.....16 discrete values
- Minimum test voltage/current.....10 V/10 mA

Uncertainty and Maximum Ratings

Nominal Resistance Value	Deviation from Nominal Value	Absolute Uncertainty of Characterized Value (tcal ±5 °C)	Maximum Continuous Test Current AC rms or DC ^[1]	Maximum Short-term Test Current AC rms or DC ^[2]	Test Current Uncertainty
25 mΩ	±50 %	±5 mΩ	30 A	40 A	1.5 % + 0.7 A
50 mΩ	±50 %	±5 mΩ	28 A	40 A	1.5 % + 0.5 A
100 mΩ	±30 %	±5 mΩ	25 A	40 A	1.5 % + 0.35 A
330 mΩ	±20 %	±7 mΩ	14 A	40 A	1.5 % + 0.3 A
500 mΩ	±10 %	±8 mΩ	10 A	40 A	1.5 % + 0.2 A
1 Ω	±10 %	±10 mΩ	8 A	40 A	1.5 % + 150 mA
1.8 Ω	±10 %	±18 mΩ	6 A	30 A	1.5 % + 100 mA
5 Ω	±10 %	±30 mΩ	3.2 A	21 A	1.5 % + 70 mA
10 Ω	±10 %	±60 mΩ	2.0 A	15 A	1.5 % + 50 mA
18 Ω	±10 %	±100 mΩ	1.5 A	10 A	1.5 % + 30 mA
50 Ω	±10 %	±300 mΩ	0.8 A	5.0 A	1.5 % + 20 mA
100 Ω	±10 %	±500 mΩ	0.5 A	3.0 A	1.5 % + 10 mA
180 Ω	±10 %	±1 Ω	0.25 A	1.35 A	1.5 % + 5 mA
500 Ω	±10 %	±2.5 Ω	0.1 A	0.6 A	1.5 % + 3 mA
1 kΩ	±10 %	± 5 Ω	0.05 A	0.3 A	1.5 % + 2 mA
1.8 kΩ	±10 %	±10 Ω	0.025 A	0.15 A	1.5 % + 2 mA

Notes:

- [1] Test currents up to 30 % of maximum continuous test current can be applied to the Calibrator with no time limitation. Test current between 30 % and 100 % of the maximum continuous test current can be applied to the Calibrator for a limited time. Minimum period of full current load is 45 seconds. The Calibrator calculates the allowed time period and when exceeded, the output connectors are disconnected.
- [2] Maximum short term test current is defined as the rms value of halfwave or fullwave test current flowing through the UUT. Maximum time of test is 200 ms. A time interval of 200 ms represents 10 full waves of power line voltage at 50 Hz and 12 full waves at 60 Hz.

Test Current Measurement

Type of recognized test current.....Positive impulse (halfwave), negative impulse (halfwave), symmetrical (fullwave).

Range.....0 to 40 A ac + dc rms

Resolution.....1 to 100 mA depending on test current and resistance output

Prospective Fault Current

Range.....0 to 10 kA

Correction Manual Mode

Residual Impedance Range.....0 to 10 Ω

Resolution.....1 mΩ

Uncertainty.....Uncertainty in manual (MAN) mode is the uncertainty of selected resistance value. See table above. Also, the uncertainty of the manually entered correction should be taken into consideration.

Correction Scan Mode

Residual Impedance Range.....0 to 10 Ω

Resolution.....1 mΩ

Uncertainty.....(1 % +15 mΩ) + uncertainty of selected resistance value.

Correction COMP Mode (Active Loop Compensation) (5320A/VLC only)

Residual Impedance Range.....0 to 2 Ω

Maximum Test Current.....<25/N A pk, where N equals number of UUT generated test current periods.

Uncertainty of compensation.....(1 % + 15 mΩ) + uncertainty of selected resistance value. Uncertainty is valid at the point in time when the COMP function is initiated.

Leakage Current Source

Range.....0.1 to 30 mA

Resolution:

Passive Mode 10 μA setting, 1 μA measurement

Differential Mode 10 μA setting, 1 μA measurement

Substitute Mode 10 μA

Active Mode (5320A/VLC only) 10 μA

Test Voltage:

Passive Mode 60 to 250 V ac + dc rms

Differential Mode 60 to 250 V ac + dc rms

Substitute Mode 10 to 250 V ac + dc rms

Active Mode (5320A/VLC only) 50 to 100 V ac + dc rms

Uncertainty:

- Passive Mode0.3 % + 2 μ A ac + dc rms
- Differential Mode0.3 % + 2 μ A ac + dc rms
- Test uncertainty can be influenced by power line voltage instability
- Substitute Mode0.3 % + 2 μ A ac + dc rms
- Active Mode (5320A/VLC only)0.3 % + 1 μ A ac + dc rms

RCD (Residual Current Device)

Trip Current Range:

- 0.5 X I and 1 X I Mode3 to 3000 mA in 1 mA steps
- 1.4 X I and 2 X I Mode3 to 1500 mA in 1 mA steps
- 5 X I Mode3 to 600 mA in 1 mA steps

- Trip Current Measurement Resolution**1 μ A on 30 mA range
- 10 μ A on 300 mA range
- 100 μ A on 3A range

Uncertainty:

- 0.5 X I and 1 X I Mode1 % rms
- 1.4 X I and 2 X I Mode2 % rms
- 5 X I Mode5 % rms

- Trip Time Range**10 to 5000 ms

- Trip Time Uncertainty**0.02 % + 0.25 ms

- Series Resistance**0.025 Ω , 0.05 Ω , 0.1 Ω , 0.33 Ω , 0.5 Ω , 1 Ω , 1.8 Ω , 5 Ω , 10 Ω , 18 Ω ,
50 Ω , 100 Ω , 180 Ω , 500 Ω , 1000 Ω , 1800 Ω

- Line/Touch Voltage Range**250 V

- Line/Touch Voltage Uncertainty**5 % + 3 V

AC/DC Voltage Calibrator (5320A/VLC only)

- Range**3 to 600 V, ac or dc

- Resolution**4 digits

Internal Ranges:

- AC Mode30, 100, 300, and 600 V (Autoranging only)
- DC Mode30, 150, and 600 V (Autoranging only)

Frequency:

- Range40 to 400 Hz
- Resolution3 digits
- Uncertainty0.02 %

- Settling Time**300 ms to 3 s, depending on output value

AC Voltage

Uncertainty and Maximum Burden Current

Range	Resolution	Uncertainty \pm (% of Output + mV)	Maximum Burden Current
3 – 29.99 V	0.001 V	0.1 % + 9	500 mA
30 – 99.99 V	0.01 V	0.1 % + 30	300 mA
100 – 299.9 V	0.1 V	0.1 % + 90	150 mA
300 – 600 V	0.1 V	0.1 % + 180	50 mA

DC Voltage

Uncertainty and Maximum Burden Current

Range	Resolution	Uncertainty \pm (% of Output + mV)	Maximum Burden Current
3 – 29.99 V	0.001 V	0.1 % + 9	2 mA
30 – 149.9 V	0.01 V	0.1 % + 45	3 mA
150 – 600 V	0.1 V	0.1 % + 180	5 mA

- AC Output Signal Distortion**0.2 % \pm 10 mV (harmonic distortion and non-harmonic noise from 20 Hz to 500 kHz), for output power lower than 10 VA on each range.

- Sensing Ammeter Current Range**500 mA

- Resolution**1 mA

- Uncertainty** \pm 5 mA

Multimeter

Voltage

Range.....0 to 1100 V ac rms or dc
 Resolution.....4½ digits
 Internal Ranges.....10, 100, and 1100 V (Autoranging only)
 Frequency Range.....DC, 20 Hz to 2 kHz
 Input Resistance.....10 MΩ ±1 %
 Time Constant.....1.5 s
 Readings/Second.....2
 Measurement Category.....1000 V CAT I, 300 V CAT II

AC/DC Voltage Uncertainty

Range	Resolution	Uncertainty ±(% of Reading + mV)
10 V	0.001 V	0.15 % + 5
100 V	0.01 V	0.20 % + 50
1100 V	0.1 V	0.20 % + 550

Current

Range.....0 to 20 A continuous, 30 A for up to 30 minutes, ac rms or dc
 Resolution.....4½ digits
 Internal Ranges.....300 mA, 3 and 30 A (Autoranging only)
 Frequency Range.....DC, 20 to 400 Hz
 Time Constant.....1.5 s
 Readings/Second.....2

AC/DC Current Uncertainty

Range	Resolution	Uncertainty ±(% of Reading + mV)
300 mA	0.1 mA	0.15 % + 0.15
3 A	1 mA	0.15 % + 1.5
30 A	10 mA	0.30 % + 15

Phantom Power

Range.....0 to 33 kVA
 Resolution.....3 digits
 Uncertainty..... $\sqrt{(V_{unc})^2 + (I_{unc})^2}$ where V_{unc} is specified uncertainty of measured voltage
 and I_{unc} is specified uncertainty of measured current.

Hipot Leakage Current Measurement Mode

Range.....0 to 300 mA ac rms or dc
 Resolution.....4 1/2 digits
 Frequency range.....DC, 20 Hz to 400 Hz
 Time constant.....1.5 s
 Readings/second.....2

Hipot Leakage Current Mode Uncertainty

Range	Resolution	Uncertainty ±(% of reading + μA)
300 uA	0.01 μA	0.3 % + 0.21
3 mA	0.1 μA	0.2 % + 1.5
30 mA	1 μA	0.2 % + 15
300 mA	10 μA	0.2 % + 150

Hipot Timer Measurement Mode

Range.....0.1 to 999 s
 Resolution.....1 ms
 Uncertainty.....0.02 % + 2 ms (dc)
 0.02 % + 20 ms (ac)

10 kV Adapter (1000:1 voltage divider)

Range.....0 to 10 kV ac peak/dc
 Resolution.....4½ digits
 Uncertainty.....0.3 % of value + 5 V dc
 0.5 % of value + 5 V ac at 50 or 60 Hz

80K-40 High Voltage Probe

Range.....0 to 40 kV ac peak/dc
 Resolution.....4½ digits
 Uncertainty.....0.5 % of value + 10 V dc
 0.5 % of value + 10 V ac at 50 or 60 Hz

5320A-LOAD Specifications

General Specifications

Power supply voltage AC adapter 100-240 V, output voltage
12 V @ 0.4 A min.

Warm-up time Not applicable

Specifications confidence level 99 %

Temperature

Operating Temperature 5 °C to 40 °C

Recommended Calibration Temperature (Tcal) . 23 °C

Storage Temperature..... -20 °C to +70 °C

Altitude, Maximum

Operating 3,050 m (10,000 ft)

Storage 12,200 m (40,000 ft)

Dimensions 430 mm X 462 mm X 95 mm
(16.9 in X 18.2 in X 3.7 in)

Weight (net) 3 kg (8 lb 4.5 oz)

Power Consumption 5 W maximum

Safety class I according to EN 61010-1

Electrical Specifications

Total resistance range 10 kΩ to 5 MΩ

Number of specific resistance values 8

Tolerance to Nominal Value 10 % (One year, Tcal 5 °C)

Maximum Ratings

Nominal Value	Max. Voltage	Max. Dissipation Power	Max. Time at Maximum Power
10 kΩ	1200 V	140 W	Limited to 3 minutes
35 kΩ	2000 V	110 W	Limited to 3 minutes
50 kΩ	2000 V	80 W	Limited to 3 minutes
100 kΩ	5500 V	300 W	Limited to 3 minutes
250 kΩ	5500 V	120 W	Limited to 3 minutes
500 kΩ	5500 V	60 W	No limit
1 MΩ	5500 V	30 W	No limit
5 MΩ	5500 V	5 W	No limit

Fluke Calibration.

Precision, performance, confidence.™

- ▶ Electrical
- RF
- Temperature
- Pressure
- Flow
- Software

Ordering information

Models	Description
5320A	Multifunction Electrical Tester Calibrator
5320A/40	Calibrator with 40 kV Probe
5320A/VLC	Calibrator with 600 V Source and Active Loop Compensator
5320A/VLC/40	5320A/VLC Calibrator with 40 kV Probe

Note: All models include the 10 kV divider/resistance multiplier adapter as standard

Accessories

5320A-LOAD	Current Calibration Load Resistors
5320/CASE	Rugged Transit Case
Y5320	Rack Mount Kit (Slides)

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