

TECHNICAL DATA

# 5322A Electrical Safety Tester Calibrator

**FLUKE**®

**Calibration**



The 5322A Electrical Safety Tester Calibrator helps calibration technicians comply with new regulatory standards up to four times faster than with traditional manual, multiple-product methods.

The 5322A facilitates compliance with exacting international standards such as the United Kingdom's BS7671 17th Edition, IEC/EN Standards, Australia and New Zealand's AS/NZS 3000 and Chinese verification/calibration regulations for various electrical testers.

The 5322A combines many functions into a single instrument, replacing discrete resistors, decade boxes and other custom solutions commonly used to calibrate electrical testers. This single-box solution speeds and simplifies calibration because users only need to learn, operate and maintain one calibrator rather than multiple instruments. And while it's difficult to automate multiple testers, the 5322A can be automated with MET/CAL® Calibration Software—further increasing speed and throughput.

Workload includes insulation resistance testers; leakage current testers; multifunction installation testers; portable appliance testers (PATs); continuity testers and earth (ground) resistance testers; loop/line impedance testers and ground bond testers; residual-current device (RCD) or ground fault current interrupter (GFCI) testers; and hipot testers.

## Calibrate to international standards

### UK 17th Edition

- BS 7671 17th Edition - Requirements for Electrical Installations, IET Wiring Regulations

### European IEC/EN Standards

- IEC/EN 60364 Series, Electrical Installations of Buildings
- EN 50191, Electrical Safety Testing Standard for the Erection and Operation of Electrical Test Equipment
- EN 61557, Electrical Safety in Low Voltage Distribution Systems Up to 1 000 V ac and 1 500 V dc
- EN 60990, Methods of Measurement of Touch Current and Protective Conductor Current

### Australian and New Zealand AS/NZS 3000

- AS/NZS 3000, Electrical Installations Wiring Rules

### Chinese verification/calibration regulations

- JJG 622-1997 Insulation Resistance Meter 1997
- JJG 1005-2005 Electrical Insulation Resistance Meter 2005
- JJG 366-2004 Earth Resistance Meter 2004
- JJG 984-2004 Ground Bond Resistance Tester 2004
- JJG 843-2007 Leakage Current Tester 2007
- JJG 795-2016 Hipot Tester 2016
- JJF 1283-2011 RCD Tester 2011

### **Maximize workload coverage in a quarter of the time**

The Fluke Calibration 5322A Electrical Safety Tester combines many functions into a single instrument, replacing discrete resistors, decade boxes and other custom solutions commonly used to calibrate electrical safety testers. It's flexible and precise enough to calibrate a wide range of instrumentation, and fast enough to handle the job in a quarter of the time you spend on manual multi-product methods.

### **Insulation resistance testers**

The 5322A calibrator sources high-value, high-voltage resistors and measures the high voltage output of megohm meters and other portable and bench insulation testers. When calibrating insulation resistance testers up to 5 kV you can select a wide range of continuously variable resistance values, from 10 k $\Omega$  to 100 G $\Omega$  with 4.5-digit resolution. When calibrating 10 kV insulation testers, the included R-multiplier extends these ranges to 10 T ohms and 10 kV. The included 10 kV divider is used to measure testers to that voltage level with greater precision (than the 40 kV probe), insuring you get the TUR you need for these tests.

### **Leakage current testers**

Simulate a leakage current for direct/touch, differential and substitute leakage current methods with 4.5-digit resolution from 0.1 mA to 30 mA. The 5322A lets you choose the leakage current test method that works best for your situation, unlike other calibrators that only offer a single method.

### **Multifunction installation testers**

The 5322A makes quick work of these multifunction installation testers with the flexibility to calibrate insulation resistance,

continuity, loop impedance, RCD and earth resistance tester capabilities. This means that calibrations are completed with one instrument

### **Portable appliance testers (PATs)**

The 5322A has all the functionality needed to calibrate PATs, with insulation resistance, ground bond, leakage current RCD, flash voltage and load test capabilities.

### **Continuity testers and earth (ground) resistance testers**

To calibrate these low ohms testers, a calibrator must be able to source precision low ohms. From its low ohms precision resistors, the 5322A calibrator sources resistance values ranging from 10 m $\Omega$  to 10 k $\Omega$ , with 3.5 digits of resolution. Choose 2-wire or 4-wire modes for maximum flexibility to 10 m $\Omega$  resistance and lower test uncertainty ratios (TURs).

### **Loop/line impedance testers and ground bond testers**

The 5322A calibrator has 16 high-power, high-current resistors it can source to increase the resistance of a loop or line by a known amount. Use Scan mode to automatically determine the resistance of the loop, and use Active Loop Compensation mode (5322A/VLC) to compensate for any residual impedance in the loop or line.

### **Residual-current device (RCD) or ground fault current interrupter (GFCI) testers**

The 5322A simulates a circuit breaker (an RCD/GFCI) to verify and calibrate trip current and trip time, without tripping the installation's current breakers. For most RCD testers, trip times are calculated to an uncertainty of 0.25 ms, to provide better than 4:1 test uncertainty ratios

(TUR). Trip current uncertainty is 1 %, which also provides better than 4:1 TURs in most applications. The 5322A also has a special PAT RCD mode to calibrate the RCD function of those testers.

### **Hipot testers**

Electrical safety testing with hipots is an integral part of development and manufacturing of electronic and electrical products, ranging from refrigerators to power supplies. Such testing is often required by government regulations to ensure product safety.

The 5322A provides best-in-class hipot calibration of ac and dc voltage. The built-in meter measures voltage and current for voltages up to 5 kV. For voltages over 5 kV the included 10 kV divider accessory or optional characterized 40 kV probe can be used. The 10 kV divider measures voltages to 10 kV with 0.5 % uncertainty. The built-in meter also measures hipot ripple coefficient and total harmonic distortion (THD).

For calibration of hipot current up to 100 mA, Fluke Calibration offers a load adapter accessory. Use the load adapter in conjunction with the 5322A built-in current meter for full calibration of hipots.

**The MET/CAL® software advantage**

The 5322A calibrator works with Fluke Calibration MET/CAL Calibration Software, in 5320A emulation mode, allowing you to increase throughput up to four times that of traditional manual and multi-product methods while ensuring calibrations are performed consistently every time. This powerful software documents calibration procedures, processes and results for ease in complying with ISO 17025 and similar quality standards.

and repair facilities to keep your equipment in top working order. Reduce your calibrator downtime and control your cost of ownership with a priority Gold CarePlan service package\*. Fluke Calibration offers CarePlans, which feature an annual standard or accredited calibration of your 5322A calibrator with guaranteed turnaround and no cost for repairs.

**The support you need, when you need it**

Fluke calibrators are known for their accuracy and reliability. Fluke operates global calibration

\* CarePlans are not available in all countries. Please check with your local Fluke Calibration sales representative for calibration services in your area.





**Flexible choices to calibrate your electrical tester workload**

Multiple model choices for the 5322A give you the flexibility to select the features best suited to your lab's workload. The base 5322A model offers 1.5 kV high resistance sourcing.

The 5322A/5 offers 5 kV high voltage resistor sourcing to handle the growing population of high voltage based safety testers. Add to either model active loop compensation and a 600 V precision ac/dc output source for calibrating devices under test (DUTs) with metering capabilities, or a characterized 40 kV probe accessory for precision measurement of very high voltages to 0.5% accuracy.

**Included accessories offer additional flexibility**

Each 5322A comes with an external R-Multiplier to source resistances of 10 TΩm for testing insulation testers. A RCD-PAT and PAT-LOAD adapter are also included for safe secure connections to the 5322A for your specific regional electrical appliance plug and socket type.

Also included is an external 10 kV divider to measure testers with 10 kV outputs, to meet more stringent test accuracy ratios required by some regulations.

This broad range of model options put you in control of selecting the right model to match your workload and your budget.



The 5322A includes an external 10 kV divider to measure testers with 10 kV outputs.



Each 5322A comes with an external R-Multiplier to source resistances of 10 TΩm for testing insulation testers.



**Optional 5322A-LOAD**

An optional 5322A-LOAD 5 kV high resistance load option is available with 5 kV high voltage resistors to allow direct connection to hipots for leakage tests. This 5322A-LOAD is unique in that it not only supports 5 kV but has nine high voltage resistors, ranging from 10 KOhm to 10 MOhm, that can be combined in parallel, within voltage limits, to obtain more precise results.

**Calibrate all major types of electrical safety testers with just one calibrator**

The 5322A calibrates all major categories of electrical safety testers. The benefits of this calibrator are best described by the key functionality it brings to calibrating the individual workloads below.

Electrical plug and socket adapters, RCD PAT Adapter and PAT LOAD Adapter are included with the 5322A to help ensure safe connections.



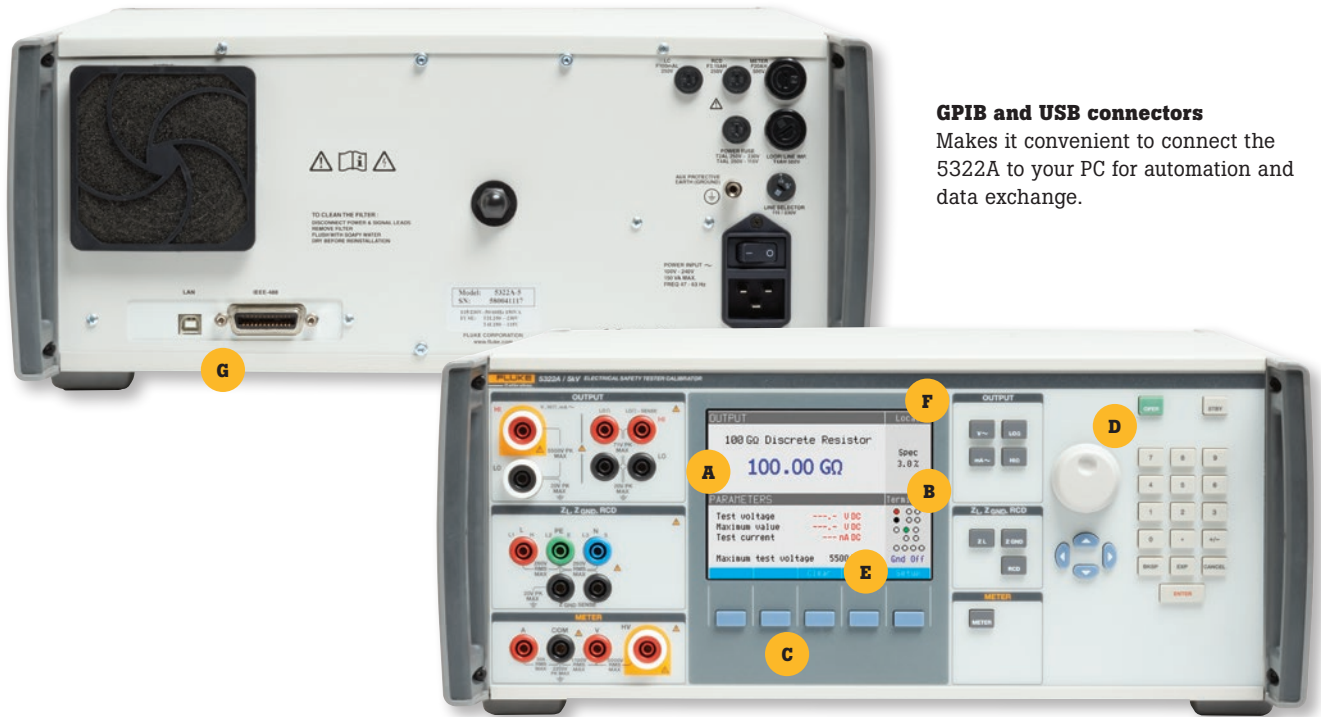
**Broad workload coverage**

The 5322A calibrates a broad range of equipment, including:

- Hipot testers
- Insulation resistance testers (megohm-meters) including older analog testers
- Loop/line impedance testers
- Continuity testers
- Earth resistance testers
- Ground bond testers
- Leakage current testers
- Circuit breaker testers (RCD/GFCI)
- Multifunction installation testers
- Portable appliance testers (PATs)



Optional 5322A-LOAD high resistance load option



**GPIB and USB connectors**

Makes it convenient to connect the 5322A to your PC for automation and data exchange.

- A Large, bright full color display**  
Large readouts enable you to easily read the primary sourced or measured values. Sourced values are in blue and measured values are in red.
- B Active terminal display**  
Always know which calibrator terminals are active. When a function has been selected, the graphical display shows the active terminals.
- C Soft menu keys**  
Soft menu keys adapt to the active function, so the menu structure is intuitive and easy to learn.
- D Output jog wheel, numeric keyboard**  
To select an output value or measurement range, use the numeric keypad or rotary jog wheel.
- E Graphical help guide**  
Find out what connections to make in an easy-to-understand graphical format. The help guide is available through the Mode softkey.
- F Spec readout**  
The spec readout lets you view the uncertainty of the sourced or measured primary value.
- G IEEE 488 and USB communication**



**5322A Electrical Safety Tester key features and benefits**

**Continuously variable high voltage resistance outputs** source high-ohms, high voltage resistors to enable calibration of insulation resistance testers / megohmmeters up to 5 kV. The continuously variable feature lets the user set any resistance value to match the DUT requirement and adjust the 5322A output to a nominal value, which aids in calibrating older-style hand-cranked testers.

**Active Loop Compensation** makes it easier to calibrate the loop/line impedance function of an installation tester by canceling residual line impedance during calibrations.

**600 V source (VLC option)** allows calibration of ac voltage measurements on workloads with measurement capabilities. This feature is also useful for powering many types of PAT testers.

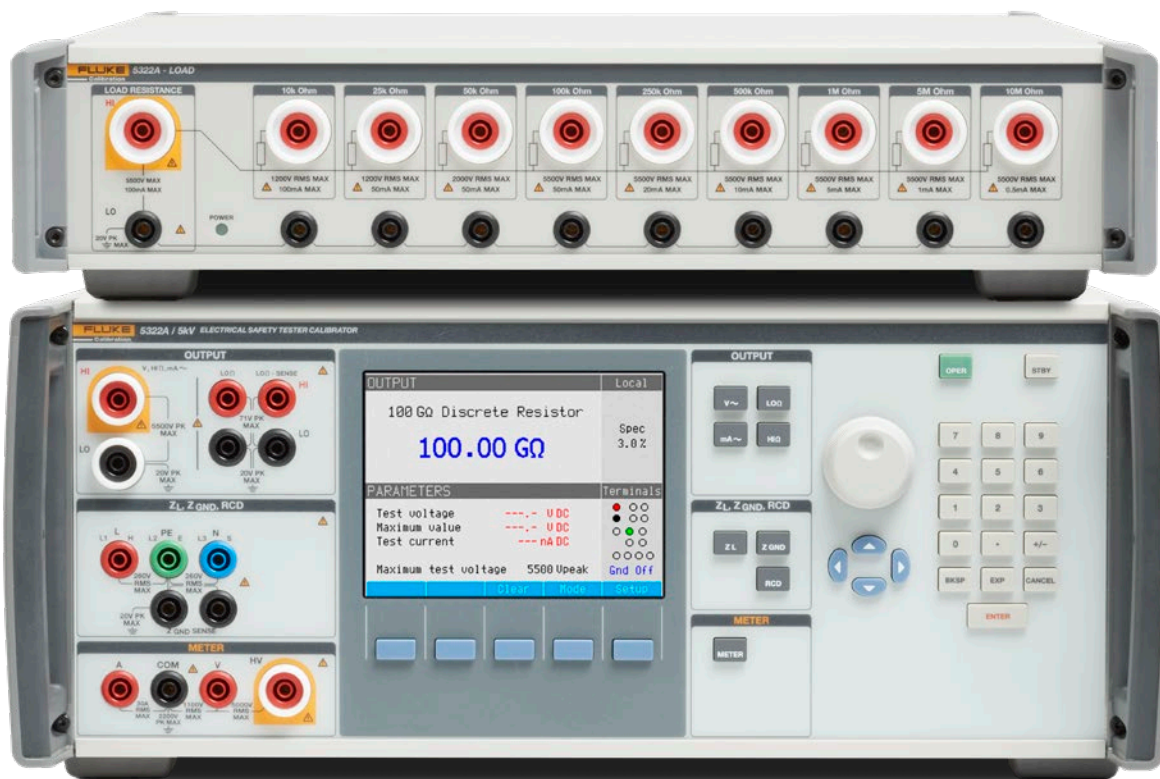
**4-wire low resistance sources** enable precision low current measurements and high current ground bond measurements, providing accuracy for testing newer 4-wire testers.

**RCD simulation** enables testing of installation and PAT testers with high time and current level accuracy. 5322A trip times provide better than 4:1 test uncertainty ratios with 1 % trip current uncertainty.

**Ripple coefficient and THD measurements** display hipot testers' signal purity measurements to 5 kV as required by many regulations.

**Multiple models** give you the flexibility to select the capabilities best suited to your workload and budget.

**MET/CAL® software compatibility** automates the 5322A in 5320A emulation mode for improved throughput and greater consistency.



## Specifications

### General specifications

<b>Specifications confidence level</b> .....	99 %
<b>Specifications interval</b> .....	1 year
<b>Power line</b> .....	115/230 V ac (50/60 Hz) +10 % / -14 %, with the maximum voltage trailing without a difference between neutral and protective earth not exceeding 15 V. Operation with power line between -10 % and -14 % has limitations in burden current for voltage outputs. See AC/DC voltage calibrator (VLC option) below.
<b>Power consumption</b> .....	1250 VA maximum

### △ Fuse protection

AC mains input .....	2 A, 250 V for 230 V, time delay (T2L250 V – 5 mm x 20 mm) 4 A, 250 V for 115 V, time delay (T4L250 V – 5 mm x 20 mm)
RCD input .....	3.15 A, 250 V, fast (F3.15H250 V – 5 mm x 20 mm)
Meter amps (A) input .....	20 A, 500 V, time delay (F20H500 V – 6.3 mm x 32 mm)
Loop/Line impedance input .....	4 A, 500 V, time delay (T4H500 V – 6.3 mm x 32 mm)
Leakage current input .....	100 mA, 250 V, fast (F100 mL250 V – 5 mm x 20 mm)

### Environment

<b>Warm-up time</b> .....	15 minutes
<b>Temperature performance</b>	
Operating temperature .....	18 °C to 28 °C
Calibration temperature (tcal) .....	23 °C
Temperature coefficient .....	Temperature coefficient for temperature outside of tcal 5 °C between 5 °C to 40 °C is 0.1 x /°C of the specification
Storage temperature .....	-10 °C to 50 °C
Storage recovery time .....	Typically <24 hours at operating temperature
<b>Relative humidity (operating)</b> .....	<80 % to 28 °C (resistance outputs >10 GΩ specified for <70 % to 28 °C)
<b>Relative humidity (storage)</b> .....	<90 % non-condensing 0 °C to 50 °C

### Altitude

Operating .....	3050 m (10 000 ft)
Storage .....	12 200 m (40 000 ft)

### Dimensions and weight

<b>Dimensions</b> .....	430 mm x 555 mm x 170 mm (16.9 in x 21.8 in x 6.7 in)
<b>Weight</b> .....	20 kg (44.1 lb)

### Compliance

#### Safety

Mains .....	IEC 61010-1: Overvoltage category II, pollution degree 2
Measurement .....	IEC 61010-2-030: 5000 V (not category rated)

#### Electromagnetic compatibility (EMC)

International .....	IEC 61326-1: Basic electromagnetic environment CISPR 11: Group 1, Class A <i>Group 1: Equipment has intentionally generated and/or uses conductively-coupled radio frequency energy that is necessary for the internal function of the equipment itself.</i> <i>Class A: Equipment is suitable for use in all establishments other than domestic and those directly connected to a low-voltage power supply network that supplies buildings used for domestic purposes. There may be potential difficulties in ensuring electromagnetic compatibility in other environments due to conducted and radiated disturbances. Emissions that exceed the levels required by CISPR</i>
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Korea (KCC) .....	Class A equipment (industrial broadcasting & communication equipment)
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USA (FCC) .....	47 CFR 15 subpart B. This product is considered an exempt device per clause 15.103 <i>Class A: Equipment meets requirements for industrial 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.</i>
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**Electrical specifications**

**Low resistance source**

Range.....100 mΩ to 10 kΩ + 10 mΩ single value selection, dc and line frequency (50/60 Hz)  
 Setting resolution ..... 3.5 digits (continuously variable)  
 Range of lead resistance compensation ..... 0 Ω to 2.000 Ω

**Uncertainty and maximum ratings**

Range	Resistance source (output)				Test voltage measurement	
	Resolution	Maximum AC rms or DC current <sup>[1]</sup>	2-wire uncertainty <sup>[1][2]</sup> (tcal ±5 °C)	4-wire uncertainty (tcal ±5 °C) <sup>[3]</sup>	Uncertainty ± (% reading + mA)	Resolution
10 mΩ <sup>[4]</sup>	-	1000 mA	-	1 % <sup>[3]</sup>	10 % + 10	10 mA
100 mΩ to 0.199 Ω	0.1 mΩ	700 mA	0.3 % + 50 mΩ	0.3 % + 10 mΩ	10 % + 10	1 mA
0.200 Ω to 0.499 Ω	1 mΩ	700 mA	0.3 % + 50 mΩ	0.3 % + 10 mΩ	10 % + 10	1 mA
0.500 Ω to 1.999 Ω	1 mΩ	700 mA	0.3 % + 50 mΩ	0.3 % + 10 mΩ	2 % + 10	1 mA
2.00 Ω to 4.99 Ω	1 mΩ	700 mA	0.3 % + 50 mΩ	0.3 % + 10 mΩ	1 % + 2	1 mA
5 Ω to 29.9 Ω	0.01 Ω	250 mA	0.2 % + 50 mΩ	0.2 % + 10 mΩ	0.2 % +1.0	1 mA
30 Ω to 199.9 Ω	0.1 Ω	100 mA	0.2 % + 50 mΩ	0.2 % + 10 mΩ	0.2 % +0.5	0.1 mA
200 Ω to 499 Ω	1 Ω	45 mA	0.2 %	0.2 %	0.2 % +0.2	0.1 mA
500 Ω to 1.999 kΩ	1 Ω	25 mA	0.2 %	0.2 %	0.2 % +0.1	0.1 mA
2 Ω to 4.99 kΩ	10 Ω	10 mA	0.2 %	0.2 %	0.2 % +0.1	0.1 mA
5 kΩ to 10 kΩ	10 Ω	5 mA	0.2 %	0.2 %	0.2 % +0.1	0.1 mA

<sup>[1]</sup> Test current can exceed 120 % of maximum current for up to 3 seconds. Terminals automatically disconnect if test current exceeds 120 % of specified maximum current.

<sup>[2]</sup> 2-Wire outputs are calibrated to the plane of the front panel terminals.

<sup>[3]</sup> Uncertainty is valid to 200 mW. For higher power rating, add 0.1 % per each 300 mW above 200 mW.

<sup>[4]</sup> Range is 4-wire only, 10 mΩ nominal, actual calibrated value is displayed. Calibration value uncertainty is specified in the table.

**Test current measurement**

Range..... 0 mA to 1000 mA (ac + dc) rms

**Short mode**

Nominal resistance in 2-wire ..... <100 mΩ  
 Maximum current..... 1000 mA (ac + dc) rms

**Open mode**

Nominal resistance ..... 30 MΩ ± 20 %  
 Maximum input voltage allowed..... 50 V (ac + dc) rms  
 Test voltage reading..... 0 V to 50 V (ac + dc) rms  
 Resolution..... 1 V  
 Uncertainty..... ± (5 % + 2 V)

**Lead resistance simulation (4-wire mode)**

Nominal resistance ..... 500 Ω, 1 kΩ, 2 kΩ, 5 kΩ ± 2 %, inserted as pairs. One resistor of the pair is in series with the LO-OHM Hi terminal, and the other resistor is in series with LO-OHM Hi sense terminal

**1.5 kV high resistance source (DC only)**

Range..... 10 kΩ to 10 GΩ + 100 GΩ single value selection  
 Resolution..... 4.5 digit (continuously variable for 10 kΩ to 10 GΩ range)

## Uncertainty and maximum ratings

Range	Resistance source (output)			Test voltage measurement	
	Resolution	Maximum voltage dc	Uncertainty <sup>[1][2]</sup> (tcal ±5 °C)	Uncertainty ± (% reading + V)	Resolution
10.000 to 19.999 kΩ	1 Ω	55 V	± 0.2 %	0.3 % + 2	0.1 V
20.00 to 39.99 kΩ	10 Ω	55 V	± 0.2 %	0.3 % + 2	0.1 V
40.00 to 99.99 kΩ	10 Ω	400 V	± 0.2 %	0.3 % + 2	0.1 V
100.00 to 199.99 kΩ	10 Ω	800 V	± 0.2 %	0.3 % + 2	0.1 V
200.0 to 999.9 kΩ	100 Ω	1100 V	± 0.2 %	0.3 % + 2	0.1 V
1.000 to 1.999 MΩ	100 kΩ	1150 V	± 0.3 %	0.5 % + 2	0.1 V
2.000 to 9.999 MΩ	1 kΩ	1150 V	± 0.3 %	0.5 % + 2	0.1 V
10.000 to 19.999 MΩ	1 kΩ	1575 V	± 0.5 %	0.5 % + 5	0.1 V
20.00 to 199.99 MΩ	10 kΩ	1575 V <sup>[3]</sup>	± 0.5 %	0.5 % + 5	0.1 V
200.0 to 999.9 MΩ	100 kΩ	1575 V <sup>[3]</sup>	± 0.5 %	0.5 % + 5	0.1 V
1.0000 to 1.9000 GΩ	100 kΩ	1575 V <sup>[3]</sup>	± 1.0 %	1 % + 5	0.1 V
2.000 GΩ to 10.000 GΩ	1 MΩ	1575 V <sup>[3]</sup>	± 1.0 %	1 % + 5	0.1 V
100 GΩ	-	1575 V <sup>[3]</sup>	3.0 % <sup>[4]</sup>	1.5 % + 5	0.1 V

<sup>[1]</sup> Uncertainty is valid up to 500 V. For test voltages above 500 V, add 0.1 % for each 200 V above 500 V.

<sup>[2]</sup> Uncertainty is valid for relative humidity RH ≤ 50 %. For operation at ambient RH in the range 50 % to 80 % and resistance output values 100.0 MΩ to 9.99 GΩ, add 0.02 x specified uncertainty / % RH. For resistance output values 10.00 GΩ to 100.0 GΩ, add 0.05 x specified uncertainty / % RH up to 70 %.

<sup>[3]</sup> Maximum test voltage with the supplied banana leads is 1000 Vrms. For higher voltages, use leads rated at 1575 V or above.

<sup>[4]</sup> Calibrated value uncertainty is specified in the table. Nominal value is ± 15 %.

### Test voltage measurement

Range..... 1200 V dc in resistance range from 10 kΩ to 1 MΩ  
2000 V dc in resistance range 1 MΩ to 100 GΩ

Settling time..... 2 seconds for input deviations of <5 %

### Test current measurement

Range..... 0 mA dc to 9.9 mA dc

Uncertainty..... ± (1.5 % + 5V/R A), where R is the selected resistance value

Settling time..... 2 seconds (for voltage reading deviations <5 %)

### Short mode

Nominal resistance..... < 250 Ω

Maximum input current allowed ..... 50 mA dc

Test current range ..... 0 mA dc to 50 mA dc

Resolution..... 0.1 mA

Uncertainty..... ± (2 % + 0.5 mA)

### Open mode

Nominal resistance..... 100 GΩ ± 15 %

Maximum input current allowed ..... 1575 V dc

Test current range ..... 0 V dc to 2000 V dc

Resolution..... 0.1 V

Uncertainty..... ± (1 % + 1 V)

**Resistance multiplier adapter (x1000 multiplier)**

Resistance range..... 350 MΩ to 10 TΩ

**Uncertainty and maximum ratings**

Range	Resolution	Maximum voltage DC	Uncertainty (tcal ±5 °C)
350.0 MΩ to 99.99 GΩ	100 kΩ	10000 V	±(1.0 % + R <sup>[1]</sup> )
100.00 GΩ to 999.9 GΩ	10 MΩ	10000 V	±(2.0 % + R <sup>[1]</sup> )
1.0000 TΩ to 10.000 TΩ	100 MΩ	10000 V	±(3.0 % + R <sup>[1]</sup> )

[1] R is the uncertainty of the 5322A resistance value to be multiplied by 1000.

**5.5 kV high resistance source (DC only) (5322A with /5 option)**

Range..... 10 kΩ to 100 GΩ

Resolution..... 4.5 digit (continuously variable)

**Uncertainty and maximum ratings**

Range	Resistance source (output)			Test voltage measurement	
	Resolution	Maximum voltage dc	Uncertainty <sup>[1][2]</sup> (tcal ± 5 °C)	Uncertainty ± (% reading + V)	Resolution
10.000 to 19.999 kΩ	1 Ω	65 V	± 0.2 %	0.5 % + 2	0.1 V
20.00 to 39.99	10 Ω	65 V	± 0.2 %	0.5 % + 2	0.1 V
40.00 to 99.99 kΩ	10 Ω	400 V	± 0.2 %	0.5 % + 2	0.1 V
100.00 to 199.99 kΩ	10 Ω	800 V	± 0.2 %	0.5 % + 10	1 V
200.0 to 999.9 kΩ	100 Ω	1100 V	± 0.2 %	0.5 % + 10	1 V
1.000 to 1.999 MΩ	1 Ω	1575 V	± 0.3 %	0.5 % + 10	1 V
2.000 to 9.999 MΩ	1 kΩ	2500 V	± 0.3 %	0.5 % + 10	1 V
10.000 to 19.999 MΩ	1 kΩ	5500 V <sup>[3]</sup>	± 0.5 %	0.5 % + 10	1 V
20.00 to 199.99 MΩ	10 kΩ	5500 V <sup>[3]</sup>	± 0.5 %	0.5 % + 10	1 V
200.0 to 999.9 MΩ	100 kΩ	5500 V <sup>[3]</sup>	± 0.5 %	0.5 % + 10	1 V
1.0000 to 1.9999 GΩ	100 kΩ	5500 V <sup>[3]</sup>	± 1.0 %	0.5 % + 10	1 V
2.000 to 9.999 GΩ	1 MΩ	5500 V <sup>[3]</sup>	± 1.0 %	0.5 % + 10	1 V
10.000 GΩ to 19.999 GΩ	1 MΩ	5500 V <sup>[3]</sup>	± 3.0 %	0.5 % + 10	1 V
20.00 GΩ to 100.00 GΩ	10 kΩ	5500 V <sup>[3]</sup>	± 3.0 %	0.5 % + 10	1 V

[1] Uncertainty is valid to 3000 V. For test voltages above 3000 V, add 0.1 % for each 1000 V above 3000 V in range 10.00 MΩ to 999 MΩ and 0.3 % in range 1.000 GΩ to 100.0 GΩ.

[2] Uncertainty is valid for relative humidity RH ≤50 %. For operation at ambient RH in the range 50 % to 80 % and resistance output values 100.0 MΩ to 9.99 GΩ, add 0.02 x specified uncertainty/ % RH. For resistance output values 10.00 GΩ to 100.0 GΩ, add 0.05 x specified uncertainty / % RH up to 70 %.

[3] Maximum test voltage with the supplied banana lead is 5000 Vrms. For higher voltages, use leads rated at ≥5000 V.

**Test voltage measurement**

Range..... 0 V dc to 5500 V dc

Test voltage indication ..... 4 digit voltmeter with range:  
 1200 V dc in resistance range 10.00 kΩ to 1.000 MΩ  
 2600 V dc in resistance range 1.000 MΩ to 10.00 MΩ  
 5500 V dc in resistance range 10.00 MΩ to 100.0 GΩ

Settling time..... 2 seconds for input deviations of <5 %

**Test current measurement**

Range..... 0 mA dc to 9.9 mA dc

Uncertainty..... ± (1.5 % + 5V/R A), where R is the selected resistance value

Settling time..... 2 seconds (for voltage reading deviations <5 %)



**Short mode**

Nominal resistance..... <250 Ω  
 Maximum input current allowed ..... 50 mA dc  
 Test current range ..... 0 mA dc to 50 mA dc  
 Resolution..... 0.1 mA  
 Uncertainty..... ± (2 % + 0.5 mA)

**Open mode**

Nominal resistance..... 100 GΩ ± 15 %  
 Maximum input current allowed ..... 1575 V dc  
 Test current range ..... 0 V dc to 2000 V dc  
 Resolution..... 0.1 V  
 Uncertainty..... ± (1 % + 1 V)

**Ground bond resistance source**

**Resistance mode**

Range..... 1 mΩ to 1700 Ω, dc and line frequency (50/60 Hz).  
 Resolution..... 17 discrete values  
 Test current measurement range ..... 0 A to 30 A (ac + dc) rms  
 Test current measurement resolution ..... 0.01 mA to 10 mA depending on resistance output and test current  
 Range of lead resistance compensation ..... 0 Ω to 2.000 Ω

**Uncertainty and maximum ratings**

2-wire nominal value	4-wire nominal value	Resistance source (output)				Test voltage measurement		
		Deviation from nominal value (both 2-wire and 4-wire)	Maximum continuous test current ACrms or DC (I <sub>o</sub> , hi) [1]	2-wire absolute uncertainty of characterized value (tcal ±5 °C)		4-wire absolute uncertainty of characterized value (tcal ± 5 °C)	Range/resolution (I <sub>o</sub> , hi)	Uncertainty (I <sub>o</sub> , hi) ± (% reading + mA)
				7 days	90 days			
	1 mΩ	± 20 %	3 A 30 A	--	--	±0.2 mΩ	4 A/1 mA 40 A/10 mA	1 % + 12 1 % + 120
20 mΩ	14mΩ	± 50 %	3 A 30 A	± 8 mΩ	± 12 mΩ	±0.40 mΩ	4 A/1 mA 40 A/10 mA	1 % + 12 1 % + 120
50 mΩ	39 mΩ	± 50 %	2.8 A 28 A	± 8 mΩ	± 12 mΩ	±0.70 mΩ	4 A/1 mA 40 A/10 mA	1 % + 12 1 % + 120
100 mΩ	94 mΩ	± 30 %	2.5 A 25 A	± 8 mΩ	± 12 mΩ	±1.2 mΩ	4 A/1 mA 40 A/10 mA	1 % + 12 1 % + 120
350 mΩ	340 mΩ	± 20 %	1.4 A 14 A	± 8 mΩ	± 14 mΩ	±2.0 mΩ	4 A/1 mA 40 A/10 mA	1 % + 12 1 % + 120
500 mΩ	490 mΩ	± 10 %	1.2 A 12 A	± 8 mΩ	± 15 mΩ	±2.7 mΩ	4 A/1 mA 40 A/10 mA	1 % + 12 1 % + 120
960 mΩ	960 mΩ	± 10 %	0.8 A 8 A	± 10 mΩ	± 20 mΩ	±4.8 mΩ	4 A/1 mA 40 A/10 mA	1 % + 12 1 % + 120
1.7 Ω	1.7 Ω	± 10 %	0.6 A 6 A	± 13 mΩ	± 25 mΩ	±8.5 mΩ	3 A/1 mA 30 A/10 mA	0.3 % + 9 0.3 % + 90
4.7 Ω	4.7 v	± 10 %	0.32 A 3.2 A	± 30 mΩ	± 37 mΩ	± 24 mΩ	2.1 A/1 mA 21 A/10 mA	0.3 % + 7 0.3 % + 70
9 Ω	9 Ω	± 10 %	0.2A 2 A	± 50 mΩ	± 60 mΩ	± 45 mΩ	1.5 A/1 mA 15 A/10 mA	0.3 % + 4 0.3 % + 40
17 Ω	17 Ω	± 10 %	0.15 A 1.5 A	± 90 mΩ	± 100 mΩ	± 45 mΩ	1 A/1 mA 10 A/10 mA	0.3 % + 3 0.3 % + 30

47 Ω	47 Ω	± 10 %	0.08 A 0.8 A	± 250 mΩ	± 300 mΩ	± 300 mΩ	0.5 A/0.1 mA 5 A/1 mA	0.3 % + 1.5 0.3 % + 15
90 Ω	90 Ω	± 10 %	0.05 A 0.5 A	± 450 mΩ	± 500 mΩ	± 500 mΩ	0.3 A/0.1 mA 3 A/1 mA	0.3 % + 1.0 0.3 % + 10
170 Ω	170 Ω	± 10 %	0.025 A 0.25 A	± 1 Ω	± 1 Ω	± 1 Ω	0.13 A/0.1 mA 1.35 A/1 mA	0.3 % + 0.5 0.3 % + 5
470 Ω	470 Ω	± 10 %	0.01 A 0.10 A	± 2.5 Ω	± 2.5 Ω	± 2.5 Ω	0.06 A/0.01 mA 0.6 A/0.1 mA	0.3 % + 0.25 0.3 % + 2.5
900 Ω	900 Ω	± 10 %	0.005 A 0.05 A	± 5 Ω	± 5 Ω	± 5 Ω	0.03 A/0.01 mA 0.3 A/0.1 mA	0.3 % + 0.15 0.3 % + 1.5
1700 Ω	1700 Ω	± 10 %	0.003 A 0.03 A	± 10 Ω	± 10 Ω	± 10 Ω	0.015 A/0.01 mA 0.150 A/0.1 mA	0.3 % + 0.07 0.3 % + 0.7

[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. The Calibrator calculates the allowed time period and when exceeded, the output connectors are disconnected. Minimum period of full current load is 45 seconds.

**Open mode**

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

**Line/loop impedance source**

**Range**.....25 mΩ to 1700 Ω  
**Resolution**.....16 discrete values  
**Range of lead resistance compensation**.....0 Ω to 2.000 Ω

**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 <sup>[1]</sup>	Maximum short-term test current AC rms or DC <sup>[2]</sup>	Test current uncertainty ±(% reading + mA)	Test current resolution
		Days since relay cleaning					
		7 days	90 days				
20 mΩ	± 50 %	± 8 mΩ	± 12 mΩ	30 A	40 A	1.5 % + 0.7 A	100 mA
50 mΩ	± 50 %	± 8 mΩ	± 12 mΩ	28 A	40 A	1.5 % + 0.5 A	100 mA
90 mΩ	± 30 %	± 8 mΩ	± 12 mΩ	25 A	40 A	1.5 % + 0.35 A	100 mA
350 mΩ	± 20 %	± 8 mΩ	± 14 mΩ	14 A	40 A	1.5 % + 0.3 A	100 mA
500 mΩ	± 10 %	± 8 mΩ	± 15 mΩ	12 A	40 A	1.5 % + 0.2 A	100 mA
0.96 Ω	± 10 %	± 10 mΩ	± 20 mΩ	8 A	40 A	1.5 % + 150 mA	10 mA
1.7 Ω	± 10 %	± 13 mΩ	± 25 mΩ	6 A	30 A	1.5 % + 100 mA	10 mA
5 Ω	± 10 %	± 30 mΩ	± 37 mΩ	3.2 A	21 A	1.5 % + 70 mA	10 mA
9 Ω	± 10 %	± 50 mΩ	± 60 mΩ	2.0 A	15 A	1.5 % + 50 mA	10 mA
17 Ω	± 10 %	± 90 mΩ	± 100 mΩ	1.5 A	10 A	1.5 % + 30 mA	10 mA
50 Ω	± 10 %	± 250 mΩ	± 300 mΩ	0.8 A	5.0 A	1.5 % + 20 mA	1 mA
90 Ω	± 10 %	± 450 mΩ	± 500 mΩ	0.5 A	3.0 A	1.5 % + 10 mA	1 mA
170 Ω	± 10 %	± 1 Ω	± 1 Ω	0.25 A	1.35 A	1.5 % + 5 mA	1 mA
500 Ω	± 10 %	± 2.5 Ω	± 2.5 Ω	0.1 A	0.6 A	1.5 % + 3 mA	1 mA
900 Ω	± 10 %	± 5 Ω	± 5 Ω	0.05 A	0.3 A	1.5 % + 2 mA	1 mA
1.7 kΩ	± 10 %	± 10 Ω	± 10 Ω	0.030 A	0.15 A	1.5 % + 2 mA	1 mA

- [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 device under test (DUT). 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 A to 40 A (ac + dc) rms

**Prospective fault current**

Range..... 0 kA to 10 kA

**Correction manual mode**

Residual impedance range..... 0 Ω to 10 Ω

Resolution..... 1 mΩ

Uncertainty..... Uncertainty in manual (MAN) mode is the uncertainty of the selected resistance value. See uncertainty and maximum range table above. Also, take into consideration the uncertainty of any manually-entered correction.

**Correction scan mode**

Residual impedance range..... 0 Ω to 10 Ω

Resolution..... 1 mΩ

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

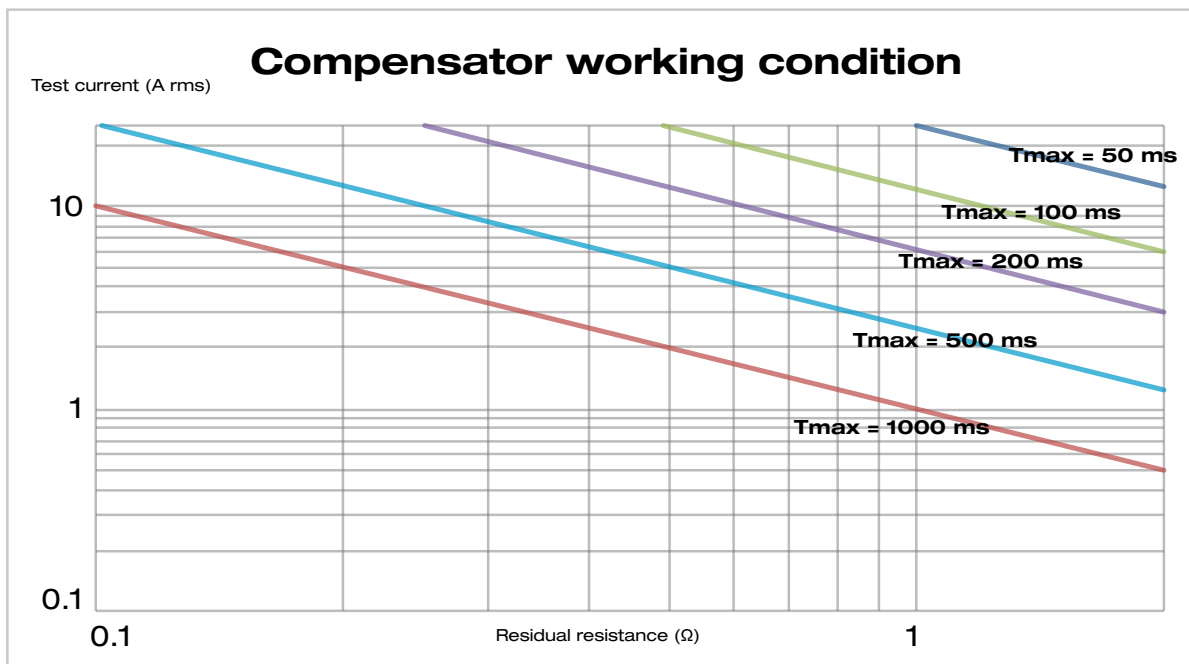
**Correction COMP mode (active loop compensation) (5322A/VLC option)**

Maximum compensated impedance..... 0 Ω to 2 Ω, see graph below for details

Maximum test current..... < 25 A, see graph below for details

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.



Residual resistance is the value of resistance which the Compensator can correct for based on the test current level sourced by the device under test (DUT). The T<sub>max</sub> parameter is the maximum time the compensator can correct the residual resistance before an overload condition is detected.



**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 ((5322A/VLC only)<sup>[1]</sup>) ..... 10 µA

**Test voltage**

Passive mode..... 60 V ac to 250 V ac rms  
 Differential mode..... 60 V ac to 250 V ac rms  
 Substitute mode..... 10 V ac to 250 V ac rms  
 Active mode (5322A/VLC only)<sup>[1]</sup>..... 50 V ac to 100 V ac rms

**Uncertainty**

Passive mode..... ± (0.3% setting + 2 µA)  
 Differential mode..... ± (0.3% setting + 2 µA)  
 Substitute mode..... ± (0.3% setting + 2 µA)  
 Active mode (5322A/VLC only)<sup>[1]</sup>..... ± (0.3% setting + 1 µA)

Test uncertainty can be influenced by power line voltage instability

<sup>[1]</sup> The active mode outputs are synchronized with the ac mains frequency to suppress interference between the calibrator and external noise sources.

**Substitute mode SHORT**

Input resistance ..... <150 Ω  
 Test current range..... 50 V  
 Test current uncertainty ..... ± (0.5% reading + 10 µA) OPEN mode input

**Substitute mode OPEN**

Input resistance ..... 30 MΩ ±5 %  
 Touch voltage range ..... 50 V  
 Touch voltage uncertainty ..... ± (2 % reading +1 V)

**Human body simulation (for substitute leakage current only)**

Resistance range ..... 0 Ω to 10 000 Ω  
 Resolution ..... 1 Ω

**RCD (residual current device) (for installation testers)**

**Trip current range:**

0.5 X I and 1 X I Mode ..... 5 to 30 mA in 1 mA steps  
 1.4 X I and 2 X I Mode..... 14 to 60 mA in 1 mA steps  
 5 X I Mode ..... 50 to 150 mA in 1 mA steps

**Trip current measurement resolution** .....

1 µA bellow 30 mA  
 10 µA in range from 30 mA to 150 mA  
 100 µA in range from 300 mA to 3 A

**Trip current measurement uncertainty:**

Trip current ..... ± 1 % of nominal current (I) setting

**Trip time range**.....

10 to 5000 ms

**Trip time uncertainty**.....

(0.02 % setting + 0.25 ms)

**Touch/line voltage**

Touch voltage range ..... 50 V  
 Touch voltage setting ..... in discrete points depending on setup trip current value  
 Touch series resistance..... 0.02 Ω, 0.05 Ω, 0.10 Ω, 0.35 Ω, 0.50 Ω, 0.96 Ω, 1.7 Ω, 4.7 Ω, 9 Ω, 17 Ω, 47 Ω, 90 Ω, 170 Ω, 470 Ω, 900 Ω, 1700 Ω  
 Line voltage range ..... 250 V  
 Line voltage uncertainty ..... ± (5 % reading + 3 V)  
 User selectable nominal line voltage..... 100 V/115 V/120 V/220 V/230 V/240 V/250 V or real  
 Post-trip delayed power restore mode ..... user selectable

**RCD (residual current device) (for PATs)**

**Trip current range**

- 0.5 X I and 1 X I mode ..... 3 to 3000 mA in 1 mA steps
- 1.4 X I and 2 X I mode..... 3 to 1500 mA in 1 mA steps
- 5 X I mode ..... 3 to 600 mA in 1 mA steps

- Trip current measurement resolution** ..... 1 µA bellow 30 mA
- 10 µA in range from 30 mA to 300 mA

**Trip current measurement uncertainty**

- Trip current ..... ± 1 % of nominal current (I) setting

- Trip time range**..... 10 to 5000 ms

- Trip time uncertainty**..... (0.02 % setting + 0.25 ms)

**Line voltage**

- Line voltage range ..... 250 V
- Line voltage uncertainty ..... ± (5 % reading + 3 V)
- User selectable nominal line voltage..... 100 V/115 V/120 V/220 V/230 V/240 V/250 V or real
- Automatic reconnection after tripping..... off/on
- Reconnection delay..... 2.5 s resistance mode

**AC/DC voltage calibrator (5322A with VLC option)**

- Range**..... 0.03 V to 600 V, ac or dc

- Resolution**..... 4 digits

**Internal ranges**

- AC mode ..... 0.3 V, 3 V, 30 V, 100 V, 300 V, and 600 V (autoranging only)
- DC mode ..... 0.3 V, 3 V, 30 V, 150 V, and 600 V (autoranging only)
- Output Resistance..... <1 Ω

**Frequency**

- Range ..... 40 Hz to 400 Hz
- Resolution ..... 3 digits
- Uncertainty ..... 0.02 %

- Settling time**..... < 3 s to 1 % floor to specified accuracy

**AC voltage**

**Uncertainty and maximum burden current**

Range	Resolution	Uncertainty ± (% of output + mV)	Maximum burden current
30.00 mV to 300.00 mV	0.01 mV	0.5 % + 1	2 mA
0.3001 V to 3.0000 V	0.0001 V	0.3 % + 3	2 mA
3.001 V to 30.000 V	0.001 V	0.1 % + 9	500 mA
30.01 V to 100.00 V	0.1 V	0.1 % + 30	300 mA
100.01 V to 300.00 V	0.01 V	0.1 % + 90	250 mA <sup>[1]</sup>
300.01 V to 600.00 V	0.01 V	0.1 % + 180	50 mA

<sup>[1]</sup> 200 mA when power line is between -10 % and -14 % of nominal.

**DC voltage**

**Uncertainty and maximum burden current**

Range	Resolution	Uncertainty ± (% of output + mV)	Maximum burden current
30.00 mV to 300.00 mV	0.01 mV	0.5 % + 1	2 mA
0.3001 V to 3.0000 V	0.0001 V	0.3 % + 3	2 mA
3.001 V to 30.000 V	0.001 V	0.1 % + 9	2 mA
30.01 V to 150.00 V	0.01 V	0.1 % + 45	3 mA
150.01 V to 600.00 V	0.01 V	0.1 % + 180	5 mA

**AC output signal distortion** ..... 0.2 % +10 mV (harmonic distortion and non-harmonic noise in

frequency range from 20 Hz to 500 kHz), for output power up to 10 VA on each range.

**Sensing ammeter current range**..... 500 mA ac  
**Resolution**..... 1 mA  
**Uncertainty**..... ± 5 mA

**Multimeter**

**Trip current range**

HV terminal to COM terminal..... 5000 V rms  
 V terminal to COM terminal..... 1100 V rms  
 COM terminal to protective earth..... 2200 V pk

**AC/DC voltage**

**Range**

V (1100 V) input..... 0 V dc to ±1100 V dc  
 10 mV to 1100 V ac rms  
 HV (5000 V) input..... 0 Vdc to ±5000 Vdc  
 5 V to 5000 V ac rms

**Resolution**..... 4 digits

**Frequency range**

V input..... DC, 20 Hz to 2 kHz  
 HV input..... DC, 20 Hz to 100 Hz

**Input resistance**..... 10 MΩ ±1 % on 10, 100, 1100 V ranges (V input terminal)  
 120 MΩ ±1 % on 5000 V rms / 5000 V dc ranges (HV input terminal)

**Settling time**..... 1.5 s below 1100 V, 3 s above 1100 V to 1 % floor to specified accuracy

**Readings/second**..... 2  
 Rolling average..... 1, 2, 4, 8, 16 readings

**Measurement category**..... CAT II

**CMRR**..... -75 dB (dc, 50 Hz or 60 Hz)

**AC/DC voltage uncertainty**

Range	Resolution	Uncertainty (dV) ± (% of reading + mV)
10 V ac/dc	0.001 V	0.15 % + 5
100 V ac/dc	0.01 V	0.20 % + 50
1100 V ac/dc	0.1 V	0.20 % + 550
5000 V rms/5000 V dc	1 V	0.30 % + 5500

**AC/DC current**

**Range**..... 0 A to 20 A continuous, 20 A to 30 A for up to 5 minutes, ac rms or dc

**Resolution**..... 4.5 digits

**Internal ranges**..... 300 mA, 3 A and 30 A (autoranging only)

**Frequency range**..... dc, 20 Hz to 400 Hz

**Settling time**..... 1.5 s to 1 % floor to specified accuracy

**Readings/second**..... 2

**Rolling average**..... 1, 2, 4, 8, 16 readings

**AC/DC current uncertainty**

Range	Resolution	Uncertainty (dI) ± (% of reading + mA) <sup>[1]</sup>	Input resistance
300 mA ac/dc	0.1 mA	0.15 % + 0.15	500 mΩ
3 A ac/dc	1 mA	0.15 % + 1.5	75 mΩ
30 A ac/dc	10 mA	0.30 % + 15	25 mΩ

<sup>[1]</sup> Uncertainty specification is valid when voltage between the COM terminal to protective earth is < 20 V rms.



**AC Power**

Range..... 0 kVA ac to 33 kVA ac  
 Voltage range ..... 0 V ac to 1100 V ac  
 Current range ..... 0 A ac to 30 A ac  
 Frequency range ..... 40 Hz to 65 Hz  
 Type ..... Apparent, active, reactive  
 Resolution..... 3.5 digits  
 Phase indication..... Phase angle (φ), power factor (PF)  
 Phase uncertainty (dφ)..... ± 0.1 °  
**Power uncertainty**  
 Active power uncertainty .....  $dPW = \sqrt{(dV^2 + dI^2 + dPF^2)} \%$   
 Reactive power uncertainty calculation .....  $dPVAR = \sqrt{(dV^2 + dI^2 + dPFVAR^2)} \%$   
 Apparent power uncertainty calculation .....  $dPVA = \sqrt{(dV^2 + dI^2)} \%$   
 Where  $dPF = \text{abs}(100 * (1 - \cos(\phi + d\phi) / \cos \phi)) \%$   
 $dPFVAR = \text{abs}(100 * (1 - \sin(\phi + d\phi) / \sin \phi)) \%$   
 φ is measured phase [°]  
 dV is the uncertainty of the measured voltage [%]  
 dI is the uncertainty of measured current [%]  
 dφ is the uncertainty of measured phase [°]

**DC Power**

Range..... 0 to 33 kVA dc  
 Voltage range ..... 0 to 1100 V dc  
 Current range ..... 0 to 30 A dc  
 Resolution..... 3.5 digits  
 Power uncertainty.....  $PW = \sqrt{(dV^2 + dI^2)} \%$   
 dV is the uncertainty of the measured voltage [%]  
 dI is the uncertainty of the measured current [%]

**Hipot leakage current measurement mode**

Range..... 0 mA ac rms or dc to 300 mA ac rms or dc  
 Resolution..... 4.5 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) [1]
300 μA	0.01 μA	0.3 % + 0.2
3 mA	0.1 μA	0.2 % + 1.5
30 mA	1 μA	0.2 % + 15
300 mA	10 μA	0.2 % + 150

[1] Uncertainty specification is valid when voltage between the COM terminal to protective earth is < 20 V rms.

**Hipot timer measurement mode**

Range..... 0.1 s to 999 s  
 Resolution..... 1 ms  
 Uncertainty..... dc ± (0.02 % reading + 2 ms)  
 ac ± (0.02 % reading + 20 ms)  
 Treshold voltage adjustment..... 10 % to 99 % of applied voltage range  
 Adjustment resolution..... 1 %

**Hipot AC voltage distortion measurement**

Frequency range ..... 45 Hz to 65 Hz  
 Number of harmonics ..... 25  
 Voltage range ..... 10 V to 5000 V rms  
 THD range ..... 0 % to 10 %

THD resolution ..... 3.5 digits  
 Uncertainty ..... ± 0.5 % THD

**Hipot DC voltage ripple coefficient measurement**

Voltage range ..... 100 V dc to 5000 V dc  
 Ripple coefficient range ..... 10 %  
 Resolution ..... 3.5 digits  
 Uncertainty (relative ripple coefficient) ..... ± 0.5 % ripple coefficient  
 Uncertainty (absolute ripple coefficient) ..... ± 0.5 % of total voltage (dc + ac) measured

*Note*

*Relative ripple coefficient is defined by the ratio  $V_{ac\ rms}/V_{dc}$  expressed in % where  $V_{ac\ rms}$  is the root mean square of the ac signal contained in the test voltage.  $V_{dc}$  is the average measured dc value of the test voltage.*

*Absolute ripple coefficient is defined by the difference between the minimum and maximum measured dc level.*

**Flash test voltage measurement (using flash LC or flash V mode)**

Class I voltage range ..... 2000 V ac rms  
 Uncertainty ..... ± (0.3 % of reading + 6 V)  
 Class II voltage range ..... 3000 V ac rms  
 Uncertainty ..... ± (1 % of reading value + 6 V)

**Flash leakage current measurement (using flash LC mode)**

Range ..... 0 mA ac rms or dc to 300 mA ac rms or dc  
 Resolution ..... 4.5 digits

**Flash leakage current mode uncertainty**

Range	Resolution	Uncertainty ± (% of reading + µA) <sup>[1]</sup>
300 µA	0.01 µA	0.3 % + 0.2
3 mA	0.1 µA	0.2 % + 1.5
30 mA	1 µA	0.2 % + 15

<sup>[1]</sup> Uncertainty specification is valid when voltage between the COM terminal to protective earth is < 20 V rms.

**10 kV divider (1000:1 voltage divider)**

Range ..... 0 kV ac peak/dc to 10 kV ac peak/dc  
 Resolution ..... 4.5 digits  
 Uncertainty ..... 0.3 % of value + 5 V dc  
 ..... 0.5 % of value + 10 V ac at 50 Hz or 60 Hz

**80K-40 high voltage probe (1000:1 voltage divider)**

Range ..... 0 kV ac peak/dc to 40 kV ac peak/dc  
 Resolution ..... 4.5 digits  
 Uncertainty ..... dc: ± (0.5 % of input + 10 V)  
 ..... dc: ± (0.5 % of input + 10 V)

*Note*

*Uncertainty specification applies to probes calibrated with the 5322A and includes specification for probe division ratio and input impedance of the Meter.*

## Ordering information

### Models \*

### Description

5322A	Multifunction electrical tester calibrator with 1.5 kV resistance
5322A/5	Multifunction electrical tester calibrator with 5 kV high voltage resistance outputs
5322A/40	Calibrator with 1.5 kV resistance and 40 kV probe
5322A/VLC	Calibrator with 1.5 kV resistance, 600 V source, voltage loop compensation
5322A/5/40	Calibrator with 5 kV resistance, and 40 kV probe
5322A/5/VLC	Calibrator with 5 kV resistance, 600 V source, voltage loop compensation
5322A/VLC/40	Calibrator with 1.5 kV resistance, 600 V source, voltage loop compensation and 40 kV probe
5322A/5/VLC/40	Calibrator with 5 kV resistance, 600 V source, voltage loop compensation and 40 kV probe

### Accessories

5322A-LOAD	High voltage resistor load for 5322A
Y5320A	Rack mount kit for 5322A – sliding
5322A/CASE	Transit case for 5322A

\*All models come with region specific line cord and adaptors, RCD-PAT adapter, PAT-LOAD adapter, R-multiplier with coax connector cable, 10 kV divider, HV test lead set, and plug and socket to banana connectors for your region. Probe models include characterized 40 kV probe matched to base model. One Year Factory warranty and UKAS Accredited calibration.

**Fluke Calibration.** *Precision, performance, confidence.™*

Electrical	RF	Temperature	Humidity	Pressure	Flow	Software
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