FLUKE®

Calibration

8508A Reference Multimeter

Reference standard accuracy and stability, in one functionally versatile, easy to use solution

Fluke Calibration - The tools of metrology

Metrology definitions

Accuracy (Measurement Accuracy)
A number which indicates the closeness of a measured value to the true value, or the ability of an instrument to make measurements with small uncertainty. Metrologists prefer to use the uncertainty of a measurement (e.g., an uncertainty of +/- 12 ppm), instead of accuracy (e.g., accurate to 99.9988 %).

Confidence Level
The percentage of the area of the nominal curve that lies above the confidence interval. A confidence level of 95 % is obtained when the range of the confidence is from minus two standard deviations, to plus two standard deviations.

Confidence Interval
A range of values under the normal curve for which a specific confidence level applies. The range of values is normally extended symmetrically from the center of the curve, in standard deviations, to a limiting value, typically plus and minus standard deviations.

Metrology

Metrology, of course, is the science of measurement. A science where the only certainty is uncertainty.

As metrologists, much of our time and effort is spent characterizing, understanding and trying to reduce or remove some of those uncertainties. Most times, characterizing is about as far as we get.

New tools often promise to help, but rarely deliver. Little understood disclaimers, footnotes or specification compromises only obscure measurement integrity and get in the way of understanding the realities of the measurement.

Compounding the problem is the scarcity of products designed specifically for metrologists. Too often we must use products intended for general purpose use, and struggle to use them effectively in the demanding science in which we engage.

At Fluke Calibration, we are metrologists and understand these issues thoroughly. The 8508A Reference Multimeter is designed specifically to address these challenges. Not only does it provide the performance you need, it is specified in a way that lets you really understand the uncertainties of those measurements. Add to that a revolutionary range of features and capabilities, a user interface that works the way you do, and you have a truly remarkable instrument. One that can only help you perform better measurements, more efficiently, and with less uncertainty than ever before.

Fluke Calibration heritage

Fluke invented the digital multimeter in 1969, and has more than four decades of experience in developing these products. Fluke also "wrote the book" on calibration, and has provided countless solutions to metrologists world-wide. With this background, the name Fluke has become virtually synonymous with both digital multimeters and with the science of metrology. Small wonder then that it would be Fluke who finally steps up to the challenge producing a digital multimeter specifically for metrology applications.

Over the years Fluke Calibration has gained additional expertise in dc and lf measurements with the acquisition of Wavetek-Datron. The acquisition of Hart Scientific, the undisputed leader in temperature measurement, has added skills and knowledge in this important area. Development of the 8508A has drawn on all of these capabilities to provide not only the best performing instrument available today, but also the most highly functional and versatile.

1948 – The company is founded by John Fluke

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Three mainstays of performance

Engineers know that three sided objects are the most solid shape possible. We know that a three legged stool is the most secure device on which to sit on virtually any surface. It seems clear then that a base of three elements is a highly effective platform. Design of the 8508A followed this principle and addressed three key areas of performance: Accuracy and Stability; Functionality and Versatility and Ease of Use.

In focusing on these three vital issues, like the triangle or the three legged stool, the 8508A provides the most solid, dependable and reliable measurement instrument available today.

Accuracy and stability

The 8508A features 8.5 digit resolution, exceptional linearity and extraordinarily low noise and stability, producing what are arguably the most accurate measurements to be had from any commercially available product today.

But that's only part of the story.

Measurements must be repeatable today, tomorrow, next week, even next year. That's why stability must be treated with the same priority as accuracy. The 8508A demonstrates 365 day stability as low as 2.7 ppm, with a 24-hour stability of 0.5 ppm, ensuring that confidence in today's measurement can be the same as it was yesterday or last year.

Full analog design

In these days of digital everything, the temptation is to digitize as soon as possible, then correct, adjust, or otherwise massage data digitally to correct for problems and produce the "right" answer. The 8508A disregards this approach entirely, and focuses on good analog design and correct measurement practice to achieve measurements in which you can have total confidence, and the stability you need to rely on day in, day out.

Importantly, this stability is achieved without the need for any kind of auto-cal or self calibration routines. While this technique may produce specifications which on paper demonstrate good stability, it means that measurement traceability and history are compromised. While this may be acceptable within some environments, it does not fulfil the exacting needs of the metrologist.

Understanding specifications

An important part of understanding what accuracy and stability numbers really mean with respect to real measurements, is to understand how those accuracy and stability numbers are stated. It is common practice to publish specifications which are absolute in nature. This provides the user with uncertainty information of product performance at the time of manufacture. Further down the line, those uncertainty figures are no longer true, but depend substantially on uncertainties available from the laboratory that calibrated the instrument, as well as the instrument itself.

To ensure that total uncertainties of measurements are fully understood, 8508A uncertainties are published in both relative terms and 365 day absolute terms inside this brochure, and in more detail, separately on the World Wide Web.

Metrology definitions

Error
Deviation from the true or nominal value. Different types of error include offset, linearity, random, retrace, reversal, scale, systematic and transfer error.

Measurement Uncertainty
An estimate of the range of values within which the true value of a measurand lies, usually centered on the nominal value.

Stability
The ability of an instrument to have a response or output that is constant with time.

Test Uncertainty Ratio (TUR)
The Test Uncertainty Ratio (TUR) for a measurand is the specified uncertainty of the instrument under test divided by the specified uncertainty of the calibrator or standard used to test it. The specifications for the instruments must have the same coverage factor.

Uncertainty
An estimate of the possible error in a measurement. More precisely, an estimate of the range of values which contains the true value of a measured quantity. Uncertainty is usually reported in the terms of probability that the true value lies within a stated range of values.

1949 – Fluke introduces its first product, a highly accurate benchtop power meter *

Extraordinary measurement capabilities

"Relative" versus "Absolute" specifications

Uncertainty specifications must be evaluated as 'relative' or 'absolute'. Relative uncertainty does not include the additional uncertainty of the reference standards used to calibrate the instrument. For example, when a digital multimeter's uncertainty is specified as 'relative' to calibration standards, this covers only the uncertainty in the digital multimeter. This is an incomplete statement regarding the instrument's total uncertainty. 'Absolute' (or total) uncertainty includes all uncertainties in the traceability chain: the 'relative' uncertainty of the unit, plus the uncertainty of the equipment used to calibrate it. This is the true specification of available instrument performance.

A standards laboratory can provide the uncertainties in their calibration standards. These uncertainties must be combined with the specifications 'relative' to calibration standards to determine the performance which is actually achieved.

Functionality and versatility

Metrologists need to make many diverse measurements as part of their complex duties. To achieve this frequently requires a complex array of instruments. The Fluke 8508A provides an extraordinarily broad range of measurement capability. This means you can undertake a wider range of applications, and perform most of your measurement requirements with a single instrument, providing real economies in time and money.

Voltage measurement

With DC and AC ranges from 200 mV to 1 kV, the 8508A covers all your voltage measurement needs. Full 8.5 digit resolution is available on all ranges to provide resolution down to 1 nV. Bandwidth for AC measurements extends to 1 MHz.

Excellent linearity, coupled with Ratio measurement capability, means that the 8508A can replace Kelvin Varley dividers and AC/DC voltage transfer standards, improving your measurement efficiency in one simple, single box solution.

Current measurements

The 8508A features a remarkable new current measurement system. For the first time, resistance at the input is virtually zero. This means that measurements can be much less invasive, and present virtually zero burden to the measurement points. It also offers the advantage that complex guarding schemes are now largely unnecessary, and measurements can be made more reliably, more repeatably and with greater confidence.

Ranges from 200 µA to 20 A and frequencies from 1 Hz to 100 kHz, again ensure that all of your measurement needs are covered including the high currents encountered when calibrating multi-function calibrators.

Resistance measurement

With ranges from 2 Ω to 20 GΩ and resolution as low as 10 nΩ the 8508A can truly be described as the ultimate resistance measurement system. Add to that a high compliance of 200 V and a high measurement current of 100 mA and you can begin to understand how the 8508A can help extend the range of your resistance measurements.

But performance of the resistance measurement system doesn't end with just specifications. Attention to measurement technique helps further improve your results. When making ratio measurements, the same current is forced through both resistances, and only the measurement is switched. Measurement current is reversible to eliminate errors due to thermal effects.

Temperature measurement

To further extend your range of measurements, the 8508A offers temperature measurement through 2, 3, or 4-wire PRT's or SPRT's, with a temperature range from -200 °C to 660 °C. With simultaneous temperature and resistance readout, ITS-90 and Callendar van Dusen Linearization's the 8508A is an ideal tool for both temperature measurement and PRT calibration applications. As with resistance, current reversal is used to remove thermal emf errors.

This greater flexibility provides the means to increase the overall range of your scope of precision measurements, and to realize better uncertainty on many of the measurements you might already perform with less than ideal equipment.

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1955 – Fluke introduces differential voltmeters

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Simple to use

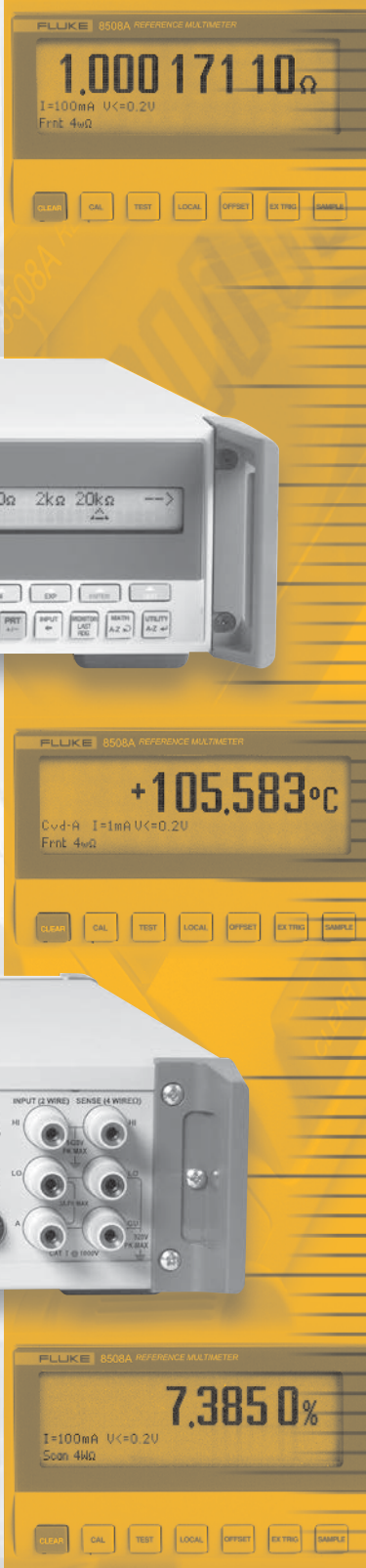
Easy to use

Human error and misunderstanding of measurement setups often have severe impact on measurement accuracy. Such errors are often due to impenetrable or complex user interfaces and lack of user familiarity. The Fluke 8508A's clear control structure, with Dual Paramatrix™ displays and context sensitive menus, provides a transparent, logical and intuitive mechanism with which to interact with the instrument.

Consistent with the philosophy of designing a product specifically for metrologists, the command and menu configuration is constructed to ensure rapid, error free access to complex measurement setups. It means that you can focus on getting the best possible results, without needing complex sequential or multi-instrument setups, or the need to perform complex mental arithmetic or math to achieve the desired result.

Two inputs

As well as conventional front input terminals, the 8508A can optionally be equipped with a duplicate set of rear input terminals. This can be invaluable in making ratio measurements, which are available on the voltage and resistance functions. They also provide the mechanism for forcing the same current through two resistances to improve resistance ratio measurements.



1969 – Fluke invents a new product, the digital voltmeter

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Performance highlights

DC Volts

- Ranges: 5, From 200 mV to 1000 V
- Maximum Measurement: 1050 V
- Resolution: user selectable from 5.5 to 8.5 digits
- Maximum Sensitivity: 1 nV

DC Current

- Ranges: 6, From 200 µA to 20 A
- Maximum Measurement: 19.999000 A
- Resolution: user selectable from 5.5 to 7.5 digits
- Maximum Sensitivity: l0 pA

AC Volts

- Ranges: 5, from 200 mV to 1000 V
- Resolution: user selectable from 5.5 to 6.5 digits
- Maximum Bandwidth: 1 MHz
- Maximum Sensitivity: 100 nV

AC Current

- Ranges: 6, from 200 µA to 20 A
- Resolution: user selectable from 5.5 to 6.5 digits
- Maximum Bandwidth: 100 kHz
- Maximum Sensitivity: l00 pA

Ohms

- Ranges: 10, 2 Ω to 20 GΩ
- Resolution: user selectable from 5.5 to 8.5 digits
- Maximum Sensitivity: l0 nΩ
- Maximum Compliance Voltage: 200 V
- Maximum Measurement Current: 100 mA

Temperature

- Two-wire, three-wire and four-wire Ohms with current reversal
- Range: From -200 °C to 660 °C
- Resolution user selectable from 5.5 to 8.5 digits
- ITS-90 linearization
- Readout: °C, °F, K or Ω

* *1972 – Fluke introduces the 8000A, the first portable bench digital multimeter*

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8508A specifications

The specifications stated here reflect a 95 % confidence level. For full and complete specifications, see the 8508A Extended Specifications or the instrument manual.

DC Voltage [1] [2] [3]

Range	Full Scale	Uncertainty Relative to Cal Stds ± (ppm Reading + ppm Range) TCal ± 1 °C [4]			Absolute Uncertainties	Temp Coefficient 15 °C–30 °C
		24 hour	90 day	365 day	365 day	(ppm/°C)
200 mV	**199.990 000**	0.7 + 0.5	1.4 + 0.5	2.7 + 0.5	4.5 + 0.5	0.4
2 V	**1.999 900 00**	0.5 + 0.2	1.4 + 0.2	2.7 + 0.2	3.0 + 0.2	0.3
20 V	**19.999 000 0**	0.5 + 0.2	1.4 + 0.2	2.7 + 0.2	3.0 + 0.2	0.3
200 V	**199.990 000**	1.0 + 0.2	2.6 + 0.2	4.0 + 0.2	4.5 + 0.2	0.7
1000 V	**1050.000 00**	1.0 + 0.5	2.6 + 0.5	4.0 + 0.5	4.5 + 0.5	0.7

Type Multi-slope, multi-cycle A-D Converter

CMRR (1 kΩ unbalance) [5] 140 dB at DC and 1 – 60 Hz

NMRR [5]
Filter Out 60 dB at 50/60 Hz ± 0.09 %
Filter In 110 dB at 50/60 Hz ± 0.09 %

Protection (All ranges) 1 kV rms

Input Impedance
200 mV to 20 V Ranges > 10 GΩ
200 V & 1000 V Ranges 10.1 MΩ ± 1 %

Max Input Current 50 pA

Ratio Accuracy Apply an RSS summation of Net Front Input accuracy and Net Rear Input accuracy [16]

Settling Time (to 10 ppm step size)
Filter Out < 50 ms
Filter In < 1 s

DC Current [1] [2] [3]

Range	Full Scale	Uncertainty Relative to Cal Stds ± (ppm Reading + ppm Range) TCal ±1 °C [4]			Absolute Uncertainties	Temp Coefficient 15 °C–30 °C
		24 hour	90 day	365 day	365 day	(ppm/°C)
200 µA	**199.990 00**	5.5 + 2.0	6.0 + 2.0	6.5 + 2.0	12 + 2.0	0.4
2 mA	**1.999 900 0**	5.5 + 2.0	6.0 + 2.0	6.5 + 2.0	12 + 2.0	0.4
20 mA	**19.999 000**	6.5 + 2.0	7.0 + 2.0	8.0 + 2.0	13 + 2.0	1.2
200 mA	**199.990 00**	28 + 4.0	30 + 4.0	33 + 4.0	36 + 4.0	6.0
2 A	**1.999 900 0**	80 + 8.0	125 + 8.0	170 + 8.0	170 + 8.0	8.0
20 A	**19.999 000**	200 + 20	290 + 20	380 + 20	380 + 20	15

Type Multi-slope, multi-cycle A-D Converter

Protection
Front Input 20 A rms
Rear Input 2 A rms, Rear Panel Fuse

Settling Time Up to 200 mA range as DCV,
2 A range < 30 s to 75 ppm step size,
20 A range (at 10 A) < 30 s to 250 ppm step size

1988 – Fluke introduces the 5700A MultiFunction Calibrator

8508A specifications

AC Voltage [1] [2] [6] [7] [9]

Range	Full Scale	Frequency (Hz)	Uncertainty Relative to Cal Stds ± (ppm Reading + ppm Range) TCal ± 1 °C [4]			Absolute Uncertainties	Temp Coefficient 15 °C–30 °C
			24 hour	90 day	365 day	365 day	(ppm/°C)
200 mV	**199.990 0**	1 – 10	80 + 70	120 + 70	120 + 70	160 + 70	5
		10 – 40	80 + 20	120 + 20	120 + 20	130 + 20	5
		40 – 100	60 + 20	100 + 20	100 + 20	110 + 20	5
		100 – 2k	40 + 10	100 + 10	100 + 10	105 + 10	5
		2k – 10k	60 + 20	100 + 20	100 + 20	105 + 20	12
		10k – 30k	250 + 30	300 + 40	300 + 40	305 + 40	15
		30k – 100k	400 + 100	700 + 100	700 + 100	705 + 100	40
2 V,	**1.999 900**	1 – 10	70 + 60	100 + 60	100 + 60	140 + 60	5
20 V &	**19.999 00**	10 – 40	70 + 10	100 + 10	100 + 10	105 + 10	5
200 V	**199.990 0**	40 – 100	50 + 10	80 + 10	80 + 10	85 + 10	5
		100 – 2k	30 + 10	60 + 10	60 + 10	65 + 10	5
		2k – 10k	50 + 10	80 + 10	80 + 10	85 + 10	10
		10k – 30k	100 + 20	200 + 20	200 + 20	205 + 20	12
		30k – 100k	250 +100	500 + 100	500 + 100	505 + 100	40
		100k – 300k	0.15 % + 0.1 %	0.3 % + 0.1 %	0.3 % + 0.1 %	0.3 + 0.1 %	60
		300k – 1M	1 % + 0.5 %	1 % + 1 %	1 % + 1 %	1 % + 1 %	80
1000 V [8]	**1050.000**	1 – 10	70 + 70	100 + 70	100 + 70	140 + 70	5
		10 – 40	70 + 20	100 + 20	100 + 20	110 + 20	5
		40 – 10k	50 + 20	80 + 20	80 + 20	95 + 20	10
		10k – 30k	100 + 40	200 + 40	200 + 40	205 + 40	12
		30k – 100k	250 + 200	500 + 200	500 + 200	510 + 200	40

Type True RMS, AC coupled measures AC component with up to 1000 V DC bias on any range. DC coupled gives $\sqrt{(AC^2 + DC^2)}$

CMRR (1 kΩ unbalance) [5] > 90 dB DC – 60 Hz

Crest Factor
200 mV to 200 V ranges 10:1 at 12 % of range, 5:1 at 50 % of range, 2.5:1 at full range
1000 V range 10:1 at 25 % of range, 5:1 at full range

Protection (All ranges) 1 kV rms

Input Impedance 1 MΩ in parallel with 150 pF

DC Accuracy (DC Coupled) Add ±(50 ppm Reading + 50 ppm Range + 20 µV)

Ratio Accuracy Apply an RSS summation of Net Front Input accuracy and Net Rear Input accuracy [16]

Settling Time (to 100 ppm step size)
100 Hz < 0.5 s
40 Hz < 1.25 s
10 Hz < 5 s
1 Hz < 50 s

Frequency Measurement
Signal Amplitude Range 5 % of range to limit set by maximum Volt.Hertz

Normal Gate Mode:
- Resolution 6.5 digits
- Frequency Range 10 Hz – 1 MHz
- Accuracy (1 year, 13 °C – 33 °C) ± (10 ppm of Reading + 2 digits)
- Sample Interval 1 s

Fast Gate Mode:
- Resolution 4.5 digits
- Frequency Range 200 Hz – 1 MHz
- Accuracy (1 year, 13 °C – 33 °C) ± 2 digits
- Sample Interval 50 ms

* *1993 – Fluke were the first in their field in the U.S to receive ISO 9001 Registration*

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8508A specifications

AC Current [1] [2] [6] [9]

Range	Full Scale	Frequency (Hz)	Uncertainty Relative to Cal Stds ± (ppm Reading + ppm Range) TCal ± 1 °C [4]			Absolute Uncertainties	Temp Coefficient 15 °C–30 °C
			24 hour	90 day	365 day	365 day	(ppm/°C)
200 µA,	**199.990 0**	1 – 10	200 + 100	250 + 100	290 + 100	475 + 100	10
		10 – 10k	200 + 100	250 + 100	280 + 100	475 + 100	10
		10k – 30k	500 + 100	600 + 100	600 + 100	650 + 100	12
		30k – 100k	0.35 % + 100	0.4 % + 100	0.4 % + 100	0.4 % + 100	40
2 mA &	**1.999 900**	1 – 10	200 + 100	250 + 100	250 + 100	290 + 100	10
20 mA	**19.999 00**	10 – 10k	200 + 100	250 + 100	280 + 100	280 + 100	10
		10k – 30k	500 + 100	600 + 100	600 + 100	650 + 100	12
		30k – 100k	0.35 % + 100	0.4 % + 100	0.4 % + 100	0.4 % + 100	40
200 mA	**199.990 0**	1 – 10	200 + 100	250 + 100	250 + 100	290 + 100	10
		10 – 10k	200 + 100	250 + 100	250 + 100	250 + 100	15
		10k – 30k	500 + 100	600 + 100	600 + 100	600 + 100	15
2 A	**1.999 900**	10 – 2k	500 + 100	600 + 100	600 + 100	600 + 100	10
		2k – 10k	600 + 100	700 + 100	700 + 100	710 + 100	15
		10k – 30k	0.25 % + 100	0.3 % + 100	0.3 % + 100	0.3 % + 100	20
20 A	**19.999 00**	10 – 2k	700 + 100	800 + 100	800 + 100	800 + 100	10
		2k – 10k	0.2 % + 100	0.25 % + 100	0.25 % + 100	0.25 % + 100	15

Type True RMS, AC coupled. DC coupled gives $\sqrt{(AC^2 + DC^2)}$

Crest Factor 3:1 at 50 % of range, 1.5:1 at full range

Protection
Front Input 20 A rms
Rear Input 2 A rms, Rear Panel Fuse

Settling Time < 0.5 s to < 50 s, depending upon range and filter settings

Resistance [1] [2] [3] [10]

Range	Full Scale	Uncertainty Relative to Cal Stds ± (ppm Reading + ppm Range) TCal ± 1 °C [4]			Absolute Uncertainties	Temp Coefficient 15 °C–30 °C
		24 hour	90 day	365 day	365 day	(ppm/°C)
2 Ω [11]	**1.999 900 00**	5.0 + 2.0	8.0 + 2.0	10 + 2.0	15 + 2.0	1.5
20 Ω [11]	**19.999 000 0**	2.5 + 0.7	4.5 + 0.7	7.0 + 0.7	9.0 + 0.7	0.6
200 Ω [11]	**199.990 000**	1.5 + 0.25	4.0 + 0.25	7.0 + 0.25	7.5 + 0.25	0.5
2 kΩ [11]	**1.999 900 00**	1 + 0.25	3.5 + 0.25	7.0 + 0.25	7.5 + 0.25	0.5
20 kΩ [11]	**19.999 000 0**	1 + 0.25	3.5 + 0.25	7.0 + 0.25	7.5 + 0.25	0.5
200 kΩ [11]	**199.990 000**	1 + 0.25	3.5 + 0.25	7.0 + 0.25	7.5 + 0.25	0.5
2 MΩ [11]	**1.999 900 00**	2 + 0.5	4.0 + 0.5	7.0 + 0.5	8.5 + 0.5	0.6
20 MΩ [12]	**19.999 000 0**	2 + 0.5	4.0 + 0.5	7.0 + 0.5	15 + 0.5	0.6
200 MΩ [12]	**199.990 000**	3.5 + 5.0	6.0 + 5.0	9.0 + 5.0	60 + 5.0	2.0
2 GΩ [12]	**1.999 900 00**	20 + 50	25 + 50	30 + 50	150 + 50	20
20 GΩ [12] [17]	**19.999 000 0**	250 + 500	350 + 500	500 + 500	525 + 500	200

Type True 4-wire with Ohms guard. 2 wire selectable

Max Lead Resistance 10 Ω in any or all leads, 1 Ω on 2 Ω range

Protection (All ranges) 250 V rms, 360 V pk

Ratio Accuracy Apply an RSS summation of Net Front Input accuracy and Net Rear Input accuracy [16]

Settling Time Up to 200 kΩ range generally the same as DCV Filter In but depends on external connections

8508A specifications

Temperature Readout [1] [2] [3]

Resistance Range	Absolute Resistance Measurement Uncertainty [13] 365 day TCal ± 1 °C [4] ± (ppm Reading + mΩ)	Typical Equivalent Temperature Measurement Uncertainty [14]			
		Probe Type	Nominal Temp (°C)	Resistance (Ω)	Accuracy ± (°C)
0 - 199.990 000 Ω	7.5 + 0.14	25 Ω PRT/SPRT	-200	5	0.0016
		25 Ω PRT/SPRT	0	25	0.0033
		25 Ω PRT/SPRT	660	84	0.0096
		100 Ω PRT/SPRT	-200	20	0.0007
		100 Ω PRT/SPRT	0	100	0.0023
		100 Ω PRT/SPRT	232	185	0.0042
200 - 1999.900 00 Ω	7.5 + 0.5	100 Ω PRT/SPRT	400	250	0.0069

Type 4-wire current reversal resistance measurement with readout of equivalent temperature. 2-wire and 3-wire selectable without current reversal. Refer to resistance specifications for additional details

Temperature Range -200 °C to 660 °C, readout also available in °F or K

Linearization ITS-90 or Callendar van Dusen. Entry and storage of coefficients and nominal resistance for up to 100 probes

Current Source 1 mA

Read Rate and Additional Uncertainty Specifications

Function	Resolution	Filter Frequency (Hz)	Read Rate (readings/second)		Additional Errors [15] ± (ppm Reading + ppm Full Scale)	
			Normal	Fast	Normal	Fast
DCV, DCI	8		1/25	1/6	0 + 0	0 + 0.1
& Ohms [10]	7		1/6	1/2	0 + 0.1	0 + 0.5
	6		2	35	0 + 0.5	0 + 2.5
	5		35	150	0 + 5	0 + 25
ACV & ACI [6]	6	1	1/50		0 + 0	
		10	1/5		0 + 0	
		40	1/2		0 + 0	
		100	1		0 + 0	
	5	1	1/50		0 + 5	
		10	1/5		0 + 5	
		40	1/2		0 + 5	
		100	2		0 + 5	
PRT & Tru Ohms	8		1/90		0 + 0	
	7		1/30		0 + 0.1	
	6		1/4		0 + 0.5	
	5		1/3		0 + 5	

2001 - Fluke acquires Wavetek Precision Measurement of Norwich, UK, becoming the unquestioned global leader in calibration

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8508A specifications

General Specifications

Power	
Voltage Frequency Consumption	100 V to rms, designed for additional voltage fluctuations ±10 %. 50 Hz to 60 Hz, designed for additional frequency variation of ±3 %. 80 VA
Dimensions	
Height Width Depth Weight	88 mm (3.5 inches) 427 mm (16.8 inches) 487 mm (19.2 inches) 11.5 kg (25.5 lbs)
Environment Temperature	
Operating Storage	0 °C to +50 °C, performance specified 5 °C to 40 °C –20 °C to +70 °C
Relative Humidity Operating [17] Storage Warm Up	(non condensing) <90 % (5 °C to 40 °C) <95 % (0 °C to 70 °C) 4 hours to full uncertainty specification
Safety **EMC**	IEC 61010-1: Overvoltage CAT II, Pollution Degree 2, 1420 Vpk max transient into measurement terminals. IEC 61326-1: Controlled environments, FCC Rules Part 15, subpart b.
Guarenteed Performance	Instrument performance is guaranteed for specifications quoted at the 99 % confidence level. See the Extended Specifications or instrument manual for full details.
Warranty	One year warranty standard; extended warranties/calibration CarePlans of up to five years are available

[1] Specifications apply for max resolution in each function, normal read mode. Specifications stated in this document are at coverage factor k=2, equivalent to 95 % confidence level, in accordance with accepted metrology practices.

[2] Assumes 4 hour warm-up period.

[3] Input zero or offset null required whenever the temperature moves more than ±1 °C from the temperature at which the previous null/zero was performed.

[4] TCal = Ambient calibration temperature. Factory calibration temperature 23 °C.

[5] Integration time > 1 Power Line cycle.

[6] Valid for signals >1 % Full Scale, Transfer mode on. Signal must be DC coupled <40 Hz.

[7] Maximum Volt.Hertz 3 x 10^7.

[8] >300 V, <10 kHz add ±0.0004 (Reading-300)^2 ppm.
>300 V, 10 kHz - 30 kHz add ±(0.0004 + (Frequency-10000) x 10^{-7}) (Reading-300)^2 ppm.
>300 V, >30 kHz add ±0.0024 (Reading-300)^2 ppm.

[9] Typical below 10Hz for ACV, below 10Hz and above 10 kHz for ACI.

[10] Tru Ohms mode available on 2 Ω to 20 kΩ ranges. Read rate reduced in Tru Ohms mode. Specifications for Tru Ohms same as corresponding normal Ohms range.

[11] Normal Ohms mode.

[12] High Voltage Ohms mode.

[13] Valid for 4-wire sensor.

[14] Not including sensor uncertainty.

[15] Assume Range and Full Scale = 2000 V when calculating for 1000 V Range. For DCI additional errors only apply in 5 digit resolution.

[16] Root Sum Square.

[17] >2 GΩ Relative Humidity Operating <80 % to 30 °C <70 % to 40 °C.

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