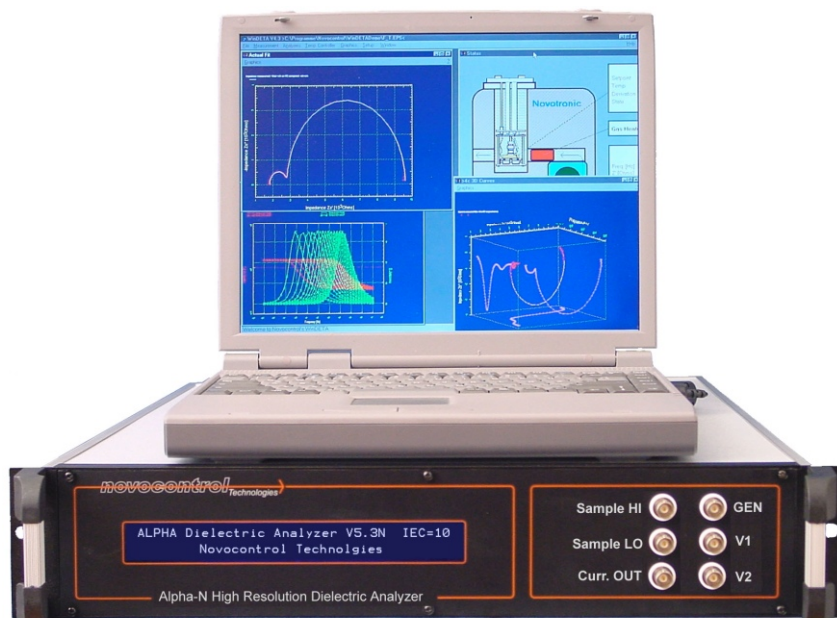


ALPHA

High Grade Dielectric Analyzer



ALPHA High Grade Dielectric Analyzer

- self-sufficient analyzer for frequency dependent measurements without compromises
- broad frequency range: 3 μ Hz ... 40 MHz
- wide impedance range: 10 m ... 100 T
- ultra-low capacity measurement capability for micro-electronics, needle contacts, stray capacities etc.
- highest phase resolution of 0.001° ($\tan \delta > 3 \cdot 10^{-5}$)
- fast data acquisition rate: 60 ms/point direct mode optionally 6 ms/point for real time measurements
- includes harmonics measurements to analyze non-linearity effects
- high level command set for easy programming
- powerful WinIMP/WinDETA software package for turnkey applications

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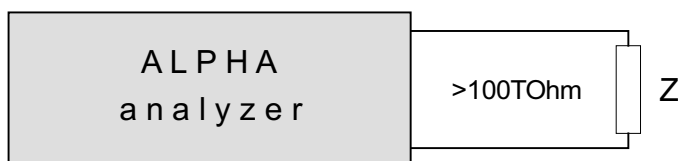
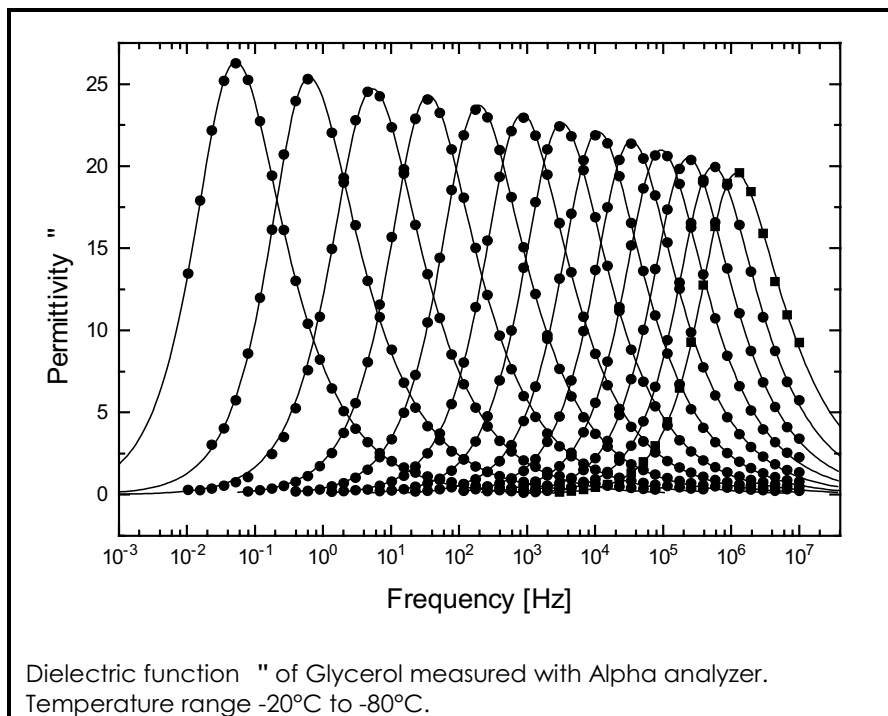
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A faster route to new materials

The ALPHA measures complex impedance $Z'+jZ''$ in the frequency domain. The instrument exhibits both the versatility of a high-precision general-purpose impedance analyzer and the particular strength for the analysis of dielectric materials. By combining a series of exceptional features in a single, compact case, the ALPHA defines a new milestone in high performance instrumentation for materials science and research.

Reference technique

In order to reach ultimate accuracy, especially with respect to low-loss materials, the ALPHA uses a particular reference technique. For each selected frequency, the measured sample impedance is compared to the measured impedance of a precision low-loss reference capacitor. The reference measurement covers all linear systematic deviations of the system, allowing to eliminate them from the sample impedance. This technology, in combination with a straightforward digital design, achieves the highest level of accuracy required for materials analysis, particularly for broadband spectroscopy of low-loss dielectrics.



Specification ALPHA Dielectric/Impedance Analyzer

	Voltage	Current	Impedance
Frequency range ALPHA-L	-	-	3 μHz – 300 kHz
Frequency range ALPHA-K	-	-	3 μHz – 3 MHz
Frequency range ALPHA-N	-	-	3 μHz – 20MHz
Frequency range ALPHA-T	-	-	3 μHz – 40MHz
AC signal	0 – 3 Vrms	0 – 60 mA	-
AC accuracy	$\pm 1\%$ + 0.1 %/MHz > 10 MHz	$\pm 1\%$ + 0.1 %/MHz > 10 MHz	-
AC resolution	50 μV	100 nA	-
DC Bias	± 40 VDC	± 75 mA	-
DC accuracy	$\pm 1\%$ + 10 mV	$\pm 1\%$ + 20 μA	-
DC resolution	10 mV	40 μA	-
Output impedance	50 Ohm $\pm 1\%$	50 Ohm $\pm 1\%$	-
Phase resolution	-	-	0.001 $^{\circ}$
Measuring V/I/R ranges	30 mV – 3 Vrms	10 fA – 60 mA	10 mOhm – 100 TOhm
Capacitance range	-	-	0.001 pF – 1 F
tan range	-	-	0 – 10 6
tan accuracy	-	-	3.10 $^{-5}$
tan resolution	-	-	10 $^{-5}$
Sweep types	voltage AC/DC	-	Frequency lin/log
Result parameters from data acquisition with WinIMP/WinDETA software	-	-	Real/Imaginary/Vector part of Z, R, X, Y, G, B, C, L plus Q and D, tan d
Interface: IEEE488 (GPIB)	-	-	-
Mains supply: 230 V $\pm 10\%$ /50 – 60 Hz	-	-	-