

Test Equipment Solutions Datasheet

Test Equipment Solutions Ltd specialise in the second user sale, rental and distribution of quality test & measurement (T&M) equipment. We stock all major equipment types such as spectrum analyzers, signal generators, oscilloscopes, power meters, logic analysers etc from all the major suppliers such as Agilent, Tektronix, Anritsu and Rohde & Schwarz.

We are focused at the professional end of the marketplace, primarily working with customers for whom high performance, quality and service are key, whilst realising the cost savings that second user equipment offers. As such, we fully test & refurbish equipment in our in-house, traceable Lab. Items are supplied with manuals, accessories and typically a full no-quibble 2 year warranty. Our staff have extensive backgrounds in T&M, totalling over 150 years of combined experience, which enables us to deliver industry-leading service and support. We endeavour to be customer focused in every way right down to the detail, such as offering free delivery on sales, covering the cost of warranty returns BOTH ways (plus supplying a loan unit, if available) and supplying a free business tool with every order.

As well as the headline benefit of cost saving, second user offers shorter lead times, higher reliability and multivendor solutions. Rental, of course, is ideal for shorter term needs and offers fast delivery, flexibility, try-before-you-buy, zero capital expenditure, lower risk and off balance sheet accounting. Both second user and rental improve the key business measure of Return On Capital Employed.

We are based near Heathrow Airport in the UK from where we supply test equipment worldwide. Our facility incorporates Sales, Support, Admin, Logistics and our own in-house Lab.

All products supplied by Test Equipment Solutions include:

- No-quibble parts & labour warranty (we provide transport for UK mainland addresses).
- Free loan equipment during warranty repair, if available.
- Full electrical, mechanical and safety refurbishment in our in-house Lab.
- Certificate of Conformance (calibration available on request).
- Manuals and accessories required for normal operation.
- Free insured delivery to your UK mainland address (sales).
- Support from our team of seasoned Test & Measurement engineers.
- ISO9001 quality assurance.

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1260

Impedance/gain-phase Analyzer

The 1260 Impedance/gain-phase Analyzer is - without doubt - the most powerful, accurate and flexible Frequency Response Analyzer available today.

In daily use by leading researchers wherever measurement integrity and experimental reliability are of paramount importance, 1260's solid reputation is frequently endorsed in published research papers in fields such as:-

- Corrosion studies
- Battery research and fuel cells
- Solar cells
- LCDs
- Bio-materials
- Ceramics / composites
- Electronic component development
- Civil engineering

Part of Solartron Analytical's extensive range of precision products designed to provide cost effective solutions for dc and ac analysis in electrochemical and materials research, 1260 offers an outstanding measurement specification for impedance spectroscopy:

Huge frequency range

Spanning 10 μ Hz to 32MHz with 0.015ppm resolution, 1260 provides excellent coverage for virtually all chemical and molecular mechanisms - all in a single instrument.

Unbeatable accuracy

With an accuracy of 0.1%, 0.1 $^\circ$, measurements can be made with complete confidence, and even the most subtle changes in sample behavior detected and quantized.

Noise free analysis

1260 uses Solartron Analytical's patented single-sine correlation technique, which inherently removes the noise and harmonic distortion which plagues lesser instruments.

- Frequency resolution: 1 in 65 million (0.015ppm)
- 0.1%, 0.1 $^\circ$ accuracy - unsurpassed by any similar instrument
- Resolution to 0.001dB, 0.01 $^\circ$ capturing every detail
- Measures impedances >100M Ω
- 2-, 3- and 4-terminal measurement configurations
- Polarization voltage up to \pm 40.95V
- Renowned ZPlot software package simplifies experiments and optimises throughput

Systems

When combined with other products from Solartron Analytical's range, including well-proven application software, 1260 can form the heart of an advanced electrochemical and materials measurement system, to provide superb accuracy, flexibility and reliability - even for the most complex research problems.

Impedance measurement

Virtually every liquid and solid is able to pass current when a voltage is applied to it. If a variable (ac) voltage is applied to the material, the ratio of voltage to current is known as the impedance. The measured impedance varies with the frequency of the applied voltage in a way that is related to the properties of the liquid or solid. This may be due to the physical structure of the material, to chemical processes within it or a combination of both.

The advantages of impedance measurement over other techniques include:-

- Rapid acquisition of data
- Accurate, repeatable measurements
- Non-destructive
- Highly adaptable to a wide variety of different applications.
- Ability to differentiate effects due to electrodes, diffusion, mass/charge transfer by analysis over different frequency ranges
- Equivalent circuit/modelling techniques for detailed analysis of results



1260 Impedance/gain-phase Analyzer Specification

Generator	Voltage mode	Current mode
ac Amplitude $\leq 10\text{MHz}$	0 to 3V rms	0 to 60mA rms
$>10\text{MHz}$	0 to 1V rms	0 to 20mA rms
Maximum ac resolution	5mV	100 μA
dc bias range	$\pm 40.95\text{V}$	$\pm 100\text{mA}$
Maximum dc resolution	10mV	200 μA
Output impedance	50 $\Omega \pm 1\%$	$>200\text{k}\Omega$ at $<1\text{kHz}$
Frequency	range: 10 μHz to 32MHz, max resolution: 10 μHz error: $\pm 100\text{ppm}$, stability, 24hrs $\pm 1^\circ\text{C}$: $\pm 10\text{ppm}$	
Sweep types	frequency (log or lin), ac/dc voltage, ac/dc current	
Maximum voltage	hi to lo: $\pm 46\text{V}$ peak, lo to ground: $\pm 0.4\text{V}$ peak	
Maximum current	$\pm 100\text{mA}$ peak	
Impedance	lo to ground: 100k Ω , $<10\text{nF}$	
Connection	single BNC, floating shield	
Output disable	contact closure or TTL logic 0	

Input System	Voltage (2x)	Current
3 independent analyzers operating in parallel		
Ranges	30mV, 300mV, 3V	6 μA , 60 μA , 600 μA , 6mA, 60mA
Maximum resolution	1 μV	200pA
Full scale peak	$\pm 5\text{V}$	$\pm 100\text{mA}$
Inputs protected to	$\pm 46\text{V}$	$\pm 250\text{mA}$
Connections	single/differential BNC	single BNC
Shields	floating/grounded	-
Coupling	dc or ac (-3dB at 1Hz)	dc or ac (-3dB at Hz)

Input impedance	Hi to shield	Shield to ground
Hi to shield	1Mohm, $<35\text{pF}$	$\geq 600\mu\text{A}$ range, 1 Ω
Shield to ground	10kohm, 330pF	$<600\mu\text{A}$ range, 50 Ω

Limits of error Ambient temperature $20 \pm 10^\circ\text{C}$, integration time $>200\text{ms}$.
Data valid for one year after calibration.

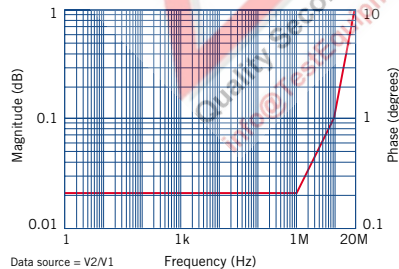
Results

Variable frequency, ac amplitude, dc bias
Measured parameters voltage gain, phase, real, imaginary, Z, R, X, Y, G, B, V, I, group delay, C, L, Q, D

Power supply 90 to 126V, 198 to 252V, 48 to 65Hz
Power consumption 230VA
Dimensions (w x h x d) 432mm x 176mm x 573mm (17in x 6.93in x 22.56in)
Weight 18kg (40lbs)
Operating temp. range 0 to 50°C (32 to 122°F)

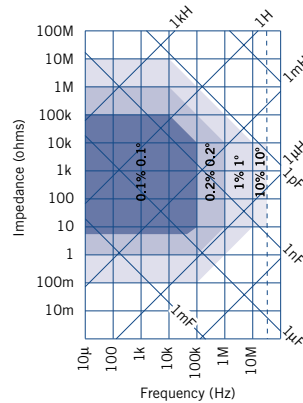
Limit of error

Gain-phase measurements
Applies to all ranges at $>10\%$ full scale



Impedance Measurements

Applies for stimulation level of 1V for impedances $>50\Omega$ or 20mA for impedances $<50\Omega$



Solartron Analytical is a world leader in instrumentation and software for the characterization of materials and electrochemical systems using precision electrical measurement techniques.

These techniques find particular use in the fields of corrosion, battery and fuel cell research, dielectric analysis and electrochemistry. The product portfolio includes industry standard frequency response analyzers, potentiostats, electrochemical software (Zplot and CorrWare) and battery test equipment.

Arun Technology, an operating unit of Solartron Analytical, provides a range of metal analyzers using optical emission techniques for determining elemental content. The units in static laboratory or mobile format are used in foundries, steelworks, or scrapyards for metals analysis or material identification.

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Solartron Analytical's Quality System is approved to BS EN ISO 9001: 1994.

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