Wayne Kerr Electronics

Technical data sheet

Precision Magnetics Analyzer - 3260B

- Wide frequency range of 20 Hz to 3 MHz
- Fast measurement speed - up to 20 measurements per second
- 0.1% basic accuracy
- Up to 125 A of DC bias current
- Telecom measurement functions
- Analysis mode with graphical displays
- Comprehensive measurement functions including leakage tests
- Straightforward intuitive operation
- Print test results
- GPIB control with LabVIEW™ driver

Completely characterize components graphically

At the design stage of component development it is vitally important to understand how the component performs under different operating conditions. This might include operation at diverse frequencies, AC drive levels or DC bias currents.

The 3260B Precision Magnetics Analyzer can plot any of the measurement functions, such as inductance (L) or impedance (Z), (including secondary term) against frequency, AC drive level or DC bias current.

Frequency sweeps within the range 20 Hz to 3 MHz can be selected. There is a choice of either linear or logarithmic frequency displays.

3260B is especially suitable for measuring parameters on telecom transformers.

The selected parameter and its secondary value are presented graphically. AC drive levels can be set between 1 mV and 10 V. DC bias current can be set from 1 mA to 1 A internally. Using external 3265B 25 A DC Bias Units bias currents can be set to a maximum of 125 A.

Measure Insertion Loss and Return Loss on telecom transformers

The 3260B Precision Magnetics Analyzer not only measures IL and RL but the instrument also allows the user to enter the values for terminating resistance or impedance, if complex, and to select a damped network or blocking capacitor if required.

Specification summary

Measurement functions	Z, Ø, L, C, Rac, Rdc, Q, D Turns ratio Primary and secondary leakage inductance Interwinding capacitance Resonant frequency
Frequency range	20 Hz to 3 MHz
Basic accuracy	0.1%
Modes	Analysis (graphing) Telecom Multi Frequency Sequence
DC bias current	1 mA to 1 A (internal) To 125 A (using five 3265B DC Bias Units)
Interface	GPIB
Measurement speed	Up to 20 measurements/sec

Printed output of test results

Using the parallel Centronics interface the user can directly print test results including graphs for further analysis and archiving.

In addition, via the GPIB interface, the instrument can be controlled from a PC and results can be read back for analysis and storage. LabVIEW™ drivers are available on request or via our website, www.waynekerrtest.com, providing a base from which a user can develop a specific test application.

Bin sort

The bin sort function allows component manufacturers to sort components in up to ten bins. Sorting is carried out either by absolute values or by percentage of values.

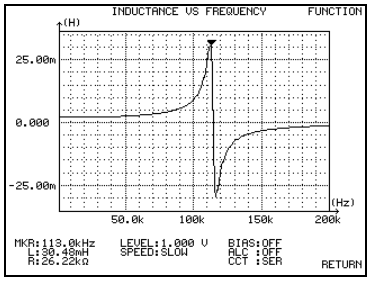
Component tests with up to 125 A DC bias current

To evaluate components at high currents up to 125 A the optional 3265B DC Bias Unit is used.

25 A of DC bias current can be set in steps of 0.025 A with one unit whilst up to five units can be used in parallel to give up to 125 A DC bias current at 1MHz (50A at 3MHz). The standard 3260B Precision Magnetics Analyzer can provide an internal DC bias from 1 mA to 1 A.

The 3265B has a number of safety and protection features including a safety interlock system to protect the user against back EMFs. It is also fully protected against over temperature, excess voltage drop and sense lead failure.

3265B DC Bias Unit can deliver up to 25 A of DC bias current in steps of 0.025 A



Inductance plotted against frequency

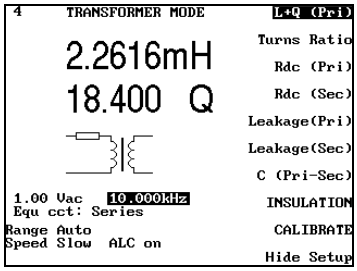
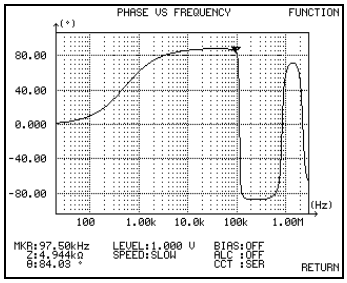


Illustration of Telecomms mode



Phase plotted against frequency

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Technical specifications
Precision Magnetics Analyzer - 3260B

Operation modes

Impedance mode
Inductance (L), Impedance (Z), DC Resistance (Rdc) and Capacitance (C).
Series or parallel equivalent circuit
Loss term: Quality factor (Q),
Dissipation factor (D), AC Resistance (Rac) and Phase Angle (Ø)

Analogue scale (bar graph) with nominal, absolute and percentage modes

Handler mode
Enables existing 4-wire scanners to be used
Functions as for impedance mode plus Turns Ratio

Transformer mode
Rdc of each winding, Primary or Secondary Leakage Inductance and Q, Turns Ratio, Interwinding Capacitance
Insulation between windings from either winding to screen/core is available as an option.

Telecom mode
Provides derivation of Insertion Loss (IL) and Return Loss (RL) for line matching transformers operating in the telephone speech band (100 Hz to 20 kHz). Values of line impedance (Zo) and termination (Rt) are user selectable. Optional simulated damping network and series blocking capacitor are user configurable.

Analysis mode
Measurement parameters and test conditions set using measurement mode.
Graphical sweep versus frequency, AC drive level or DC bias current with selection of start, stop, step size, units and linear/log.

Multi-frequency mode
Measurement parameters and test conditions set using measurement mode. Up to eight frequencies with absolute or percentage limits on major term PASS/FAIL indications.

Test conditions

Low level AC drive
For measurement of L + Q, Ls + Rs,
C, Z, Turns Ratio and Leakage Inductance

Frequency range
20 Hz to 3 MHz interwinding capacitance, minimum frequency 100 Hz

Steps
Increments of 1% or better across range
1800 frequencies approx.
Accuracy of selected frequency ±0.01 %

Drive level
Source impedance 50 Ω
1 mV to 10 V rms into open circuit
50 µA to 200 mA rms into short circuit

Automatic Level Control (ALC) maintains level applied to DUT at ±2%, ±1 mV of set voltage or ± 2% ±0.1 mA of set current.

DC bias current
1 mA to 1 A DC (2A /U option) is available from internal, fast settling bias supply over full frequency range
Voltage compliance 20 V minimum
Safety interlock minimises operator exposure to high currents.

DC resistance
Low test level of 100 mV minimises heating of the device under test.
Short circuit current 10 mA

Insulation (option)
Test voltages of 100, 200 or 500 V DC, user selectable
Results can be displayed as a current or resistance value
Voltage accuracy ±3%
For user safety, short circuit current is limited to <2 mA

Bin Handler mode (option)
Sort to 1 of 10 bins using absolute or percentage limits.
Separate Pass/Fail output.
Up to 100 bin limit set-ups stored in non-volatile memory.
TTL interface to external bin handler via 25 way D type connector.

Telecom mode (option)
Drive level -28 to 16 dBm
Test time varies with level
Zo/Rt 50 to 2000 Ω
Test time < 1.5 s typical

Measurement speeds
For impedance, turns ratio, DC resistance and insulation
4 speeds selectable: MAXimum, FAST, MEDium and SLOW
MAX (20 measurements per second)
for component sorting under GPIB remote control.
FAST Approximately 10 measurements per second.
SLOW Approximately 1 per second for increased stability and accuracy

Measurement ranges
R 0.01 mΩ to >2 GΩ*
L 0.1 nH to >1000 H*
C 5 fF to >1 F*

Accuracy
Inductance/Rac/Z/Cp ±0.1 %**
Q ±0.1% (Q+1/Q)**
D ±0.001 $(1+D^2)$**
Turns ratio ±0.1 %**
Rdc ±0.5 %
Insulation ±5 % (500 V test)
Insertion loss ±0.1 dB
Return loss ±1 dB
Basic accuracy varies with frequency, Zo, Rt, range and level

* Varies with measurement speed
** Varies with frequency and option chosen

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General data

Input specification
Power supply
230V AC ±10% or
115V AC ±10% (selectable)
50 to 400 Hz
400 VA maximum consumption

Display
High contrast monochrome LCD
320 x 240 dot with back lighting.
Visible area 115 x 86mm.
Viewing angle 45°

Measurement connections
8 front panel BNC sockets
2- or 4-wire (Kelvin) measurements with screen at ground potential
Equivalent circuit symbols on screen.
Separate terminals for primary and secondary connections.
LEDs indicate active terminals.

Remote control (option)
Conforms with GPIB IEEE488.2 and SCPI 1992.0

Printer output
Centronics parallel printer port

Ambient conditions
Operating temperature range 0°C to 40°C.
Full accuracy 15°C to 35°C

Safety
Complies with the requirements of EN61010-1

EMC
Complies with EN50081-1, EN50082-1 generic emissions and immunity standards by meeting with the requirements of EN55022, IEC801.2, IEC801.3 and IEC801.4

Mechanical (approx. overall)
Height 150 mm (6“)
Width 440 mm (17 3/8“)
Depth 520 mm (20 1/2“)
Weight 11 kg (24 lb 4oz.)

Order codes and options

Description	*Order code*
3260B Precision Magnetics Analyzer Supplied with user manual, power cable, spare fuses, two transfer standard capacitors and safety interlock jack	**1J3260B**

Options

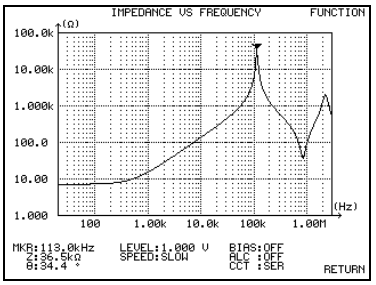
Insulation resistance test (500 V)	**/N**
Analysis function (graphs)	**/G**
LF Telecom function	**/T**
Bin handler	**/D**
Faster DC bias ramp up & ramp down	**/S**

Auxiliary unit

25A DC bias unit 3265B (1 MHz) Supplied with user manual, power cable, spare fuses, 4 x BNC to BNC links, daisy chain link, rack mounting ears and bus bars.	**1J3265B**
25A DC bias unit 3265BQ (3 MHz) Supplied with user manual, power cable, spare fuses, 4 x BNC to BNC links, daisy chain link, rack mounting ears (unit needs rear support) and bus bars.	**1J3265BQ**

Accessories

Description	*Order code*
Rack mounting kit. 3U x full width	**1EXA20230**
Kelvin clips (fine jaws). (2 sets recommended for transformer tests)	**1EVA40100**
Kelvin clips (large jaws)	**1EVA40180**
BNC to 4-terminal component fixture. Recommended above 500 kHz	**1EV1006**
4-terminal lead set	**1EV1505**
(SMD Tweezers	**1EVA40120**



Impedance plotted against frequency