

## 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

With the dramatic growth of PCs connected to the telephone system for Internet access has come the requirement to measure Insertion Loss (IL) and Return Loss (RL) of line matching 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, $\emptyset$ , 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.waynekertest.com](http://www.waynekertest.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. 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 125 A of DC bias current in steps of 0.025 A

## SMD inductor tests up to 50 A

With the addition of the 1009 DC Bias Fixture DC bias currents up to 50 A can be applied to an SMD inductor during component test in order to evaluate the devices thoroughly at the operational bias currents.

The fixture operates with one or two 3265B Wayne Kerr DC bias units and a 3260B Precision Magnetics Analyzer.

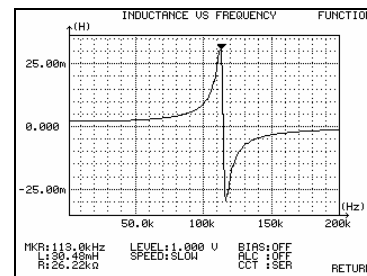
Four rear panel mounted BNC connectors and two captive high current cables ensure simplicity and ease of use with the 3265B.

Interchangeable component test carriers ensure that the 1009 DC Bias Fixture may be used with a wide variety of devices. If a device package is not supported by one of the standard carriers then a custom carrier design service is available.

Stable component fixturing ensures high accuracy and repeatable measurements. Enclosed fixtures, with safety interlocks, minimises risk to operators.

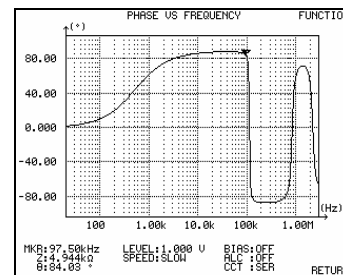
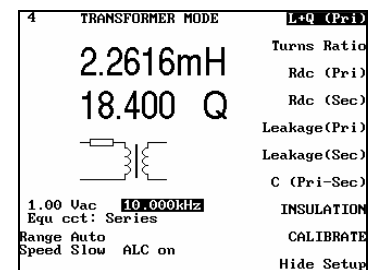


1009 DC Bias Fixture enables currents up to 50 A to be applied to an SMD inductor



Inductance plotted against frequency

Illustration of Telecomms mode



Phase plotted against frequency

## 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 ( $\emptyset$ )

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 ( $Z_0$ ) and termination ( $R_t$ ) 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  $\pm 0.01$  %

#### **Drive level**

Source impedance 50  $\Omega$

1 mV to 10 V rms into open circuit

50  $\mu$ A to 200 mA rms into short circuit

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

#### **DC bias current**

1 mA to 1 A DC 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  $\pm 3\%$

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

$Z_0/R_t$  50 to 2000  $\Omega$

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 m $\Omega$  to  $> 2$  G $\Omega^*$

L 0.1 nH to  $> 1000$  H\*

C 5 fF to  $> 1$  F\*

#### **Accuracy**

Inductance/Rac/Z/Cp  $\pm 0.1$  %\*\*

Q  $\pm 0.1\%$  (Q+1/Q)\*\*

D  $\pm 0.001$  (1+D<sup>2</sup>)\*\*

Turns ratio  $\pm 0.1$  %\*\*

Rdc  $\pm 0.5$  %

Insulation  $\pm 5$  % (500 V test)

Insertion loss  $\pm 0.1$  dB

Return loss  $\pm 1$  dB

Basic accuracy varies with frequency,  $Z_0$ ,  $R_t$ , range and level

\* Varies with measurement speed

\*\* Varies with frequency and option chosen

## General data

### Input specification

Power supply  
230V AC  $\pm 10\%$  or  
115V AC  $\pm 10\%$  (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 <sup>3</sup>/<sub>8</sub>" )  
Depth 520 mm (20 <sup>1</sup>/<sub>2</sub>" )  
Weight 11 kg (24 lb 4oz.)

## Order codes and options

### Description

3260B Precision Magnetics Analyzer  
Supplied with user manual, power cable,  
spare fuses, two transfer standard capacitors  
and safety interlock jack

### Order code

**1J3260B**

### Options

/N Insulation resistance test (500 V)  
/G Analysis function (graphs)  
/T LF Telecom function  
/D Bin handler

### Auxiliary unit

25A DC bias unit 3265B (1 MHz) **1J3265B**  
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.

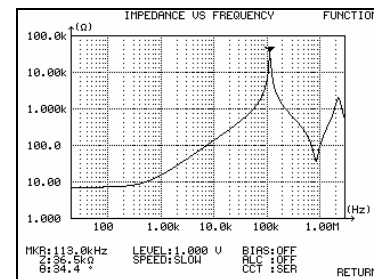
25A DC bias unit 3265BQ (3 MHz) **1J3265BQ**  
Supplied with user manual, power cable,  
spare fuses, 4 x BNC to BNC links, daisy chain  
link, rack mounting ears (unit needs rear support)  
and bus bars.

### Accessories

#### Description

1009 DC Bias Fixture **1J1009**  
Rack mounting kit. 3U x full width **1EXA20230**  
Kelvin clips (fine jaws). **1EVA40100**  
(2 sets recommended for transformer tests)  
Kelvin clips (large jaws) **1EVA40180**  
BNC to 4-terminal component fixture. **1EV1006**  
Recommended above 500 kHz  
4-terminal lead set **1EV1505**  
(SMD Tweezers) **1EVA40120**

#### Order code



Impedance plotted against frequency