Wayne Kerr Electronics

DC BIAS UNITS

3265B Series

User Manual

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CONTENTS

ILLUSTRATIONS

1. SAFETY

1.1 General

This equipment has been designed to meet the requirements of EN61010-1 ‘Safety requirements for electrical equipment for measurement, control & laboratory use’ and has left the factory in a safe condition.

The following definitions in EN61010-1 are applicable:

OPERATOR	Person operating equipment for its intended purpose. **Note: The OPERATOR should have received training appropriate for this purpose.**
RESPONSIBLE BODY	Individual or group responsible for the use and maintenance of equipment and for ensuring that operators are adequately trained.

The RESPONSIBLE BODY must ensure that this equipment is only used in the manner specified. If it is not used in such a manner, the protection provided by the equipment may be impaired.

This product is not intended for use in atmospheres which are explosive, corrosive or adversely polluted (e.g. containing conductive or excessive dust). It is not intended for use in safety critical or medical applications.

The equipment can cause hazards if not used in accordance with these instructions. Read them carefully and follow them in all respects.

Do not use the equipment if it is damaged. In such circumstances the equipment must be made inoperative and secured against any unintentional operation.

WARNING Back EMF!

Lethal back-emf potentials can be generated if an inductor under test is disconnected whilst current is still flowing in it. The energy is proportional to the square of the current and back-emfs can reach several kilovolts.

NEVER touch the test connections while the direct current is flowing.

USE the Safety Interlock, see section 4.2.7—Safety Interlock.

1.2 AC Power Supply

Power cable and connector requirements vary between countries. Always use a cable that conforms to local regulations, terminated in an IEC320 connector at the instrument end.

If it is necessary to fit a suitable AC power plug to the power cable, the user must observe the following colour codes:

WIRE	EUROPEAN	N. AMERICAN
LIVE	BROWN	BLACK
NEUTRAL	BLUE	WHITE
GROUND	GREEN/YELLOW	GREEN

The user must also ensure that the protective ground lead would be the last to break should the cable be subject to excessive strain.

If the plug is fused, a 13-amp fuse should be fitted.

If the power cable electrical connection to the AC power plug is through screw terminals then, to ensure reliable connections, any solder tinning of the cable wires must be removed before fitting the plug.

Before switching on the equipment, ensure that it is set to the voltage of the local AC power supply.

WARNING!

Any interruption of the protective ground conductor inside or outside the equipment or disconnection of the protective ground terminal is likely to make the equipment dangerous. Intentional interruption is prohibited.

1.3 Adjustment, Maintenance and Repair

WARNING!

The equipment must be disconnected from all voltage sources before it is opened for any adjustment, replacement, maintenance, or repair.

When the equipment is connected to the local AC power supply, internal terminals may be live and the opening of the covers or removal of parts (except those to which access can be gained by hand) is likely to expose live parts.

Capacitors inside the equipment may still be charged even if the equipment has been disconnected from all voltage sources.

Any adjustment, maintenance, or repair of the opened equipment under voltage must be carried out by a skilled person who is aware of the hazards involved.

Service personnel should be trained against unexpected hazards.

Ensure that only fuses with the required rated current and of the specified type are used for replacement. The use of makeshift fuses and short-circuiting of fuse holders is prohibited.

1.4 Static Electricity

The unit supplied uses static-sensitive devices. Service personnel should be alerted to components which require handling precautions to avoid damage by static electrical discharge.

Before handling circuit board assemblies containing these components, personnel should observe the following precautions:

1) The work surface should be a conductive grounded mat.
2) Soldering irons must be grounded and tools must be in contact with a conductive surface to ground when not in use.
3) Any person handling static-sensitive parts must wear a wrist strap which provides a leaky path to ground, impedance not greater than 1MΩ.
4) Components or circuit board assemblies must be stored in or on conductive foam or mat while work is in progress.
5) New components should be kept in the suppliers packaging until required for use.

WAYNE KERR ELECTRONICS and the associated sales organizations accept no responsibility for personal or material damage, or for any consequential damage that results from irresponsible or unspecified operation or misuse of this equipment.

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2. INTRODUCTION

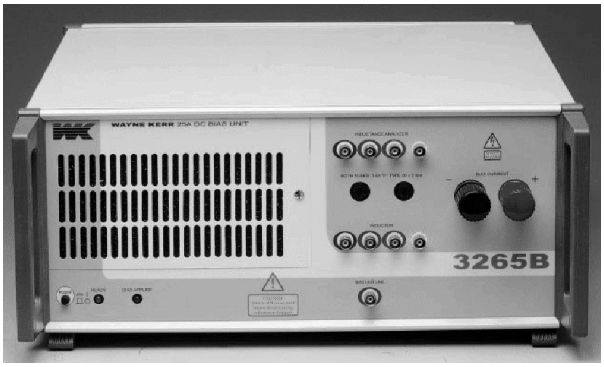


Figure 2-1 3265B/25A Bias Unit

2.1 3265B

The 3265B series of DC bias units can be used on the bench-top or rack-mounted. Each model in the series is intended to be used with an Inductance Analyzer 3255B or Precision Magnetics Analyzer 3260B, extending the DC bias capability from 1A to 25A (3265B/25A). The 3255BL may only be used with a 3265B/5A or 3265B/10A. Up to five 3265B series bias units, with the outputs connected in parallel, may be connected to a single analyzer to give a maximum of 125A DC bias capability (3265B/25A).

Bias currents of less than 1A may be applied using the analyzer BNC terminals when a 3265B is connected. Alternatively, bias currents from 25mA to the maximum current of the DC bias unit may be applied from the 3265B heavy current terminals.

Fuses are incorporated on the front panel of the 3265B to protect low current cables.

Figure 2-2 3255B Inductance Analyzer

Figure 2-3 3260B Precision Magnetics Analyzer

The host analyzer has full control of the 3265B, output current being set via a menu from the analyzer or by GPIB statements. Warning messages and the status of the 3265B are displayed on the analyzer. A warning LED on the analyzer and 3265B indicates when DC bias is being applied. The 3265B will go into standby mode if the analyzer mains power is removed.

Fixtures must be designed using the safety interlock with a suitable screen or cover on the analyzer to protect an operator when bias current is applied. Bias current will only be applied when the contacts on the safety interlock socket are shorted together.

Please read section 1—Safety, before using the instrument.

2.2 3265BQ Extended Frequency

The Q variant of the 3265B is functionally the same as the standard unit except it allows measurements to be made up to 3MHz with a bias current of 25A. The bias current may be increased to a maximum of 50A by using two 3265BQ/25As.

It is recommended that the 1009 high current fixture is used with the 3265BQ/25A. See section 2.3 for more details.

Please read section 1—Safety, before using the instrument.

2.3 1009 High Current Fixture (Optional)

Figure 2-4 1009 High Current Fixture

The 1009 high current fixture enables a DC bias current of up to 50A to be applied to an inductor during component test.

The fixture has been designed to work specifically with one or two 3265B or 3265BQ/25A Bias units and a 3260B Precision Magnetics Analyzer or a 3255B Inductance Analyzer. Four rear panel mounted BNC connectors and two captive high current cables ensure ease of use with the 3265B Bias Unit.

The 1009 bias interlock cable connects the 1009 lid safety interlock mechanism to the analyzer safety interlock ensuring operator safety by removing DC bias current when the fixture lid is opened.

Figure 2-5 Typical Component Fixture Plate

An interchangeable component fixture plate ensures that 1009 may be used to test a wide variety of devices.

3. INSTALLATION

3.1 AC Line Connections

The unit is provided with a power cable capable of carrying the input current for both 115V and 230V operation. This cable should be connected via a suitable connector to the local AC power supply. The colour code employed is as follows:

WIRE	EUROPEAN	N. AMERICAN
LIVE	BROWN	BLACK
NEUTRAL	BLUE	WHITE
GROUND	GREEN/YELLOW	GREEN

No adjustment is required for variation of supply frequency or supply voltage*.

Before connecting the AC power, read the precautions listed under section 1.2—AC Power Supply.

The instrument is not suitable for battery operation.

The power switch is located on the left of the front panel.

* The analyzer requires setting to the correct operating voltage.

3.2 Safety Interlock

WARNING!

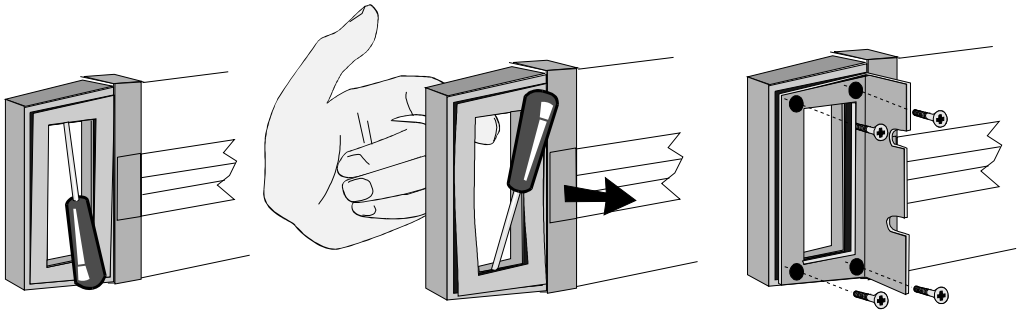
Improper use of this instrument could be fatal

To protect the user against lethal back-emf potentials, there is a facility to inhibit the operation of a DC bias current function by removing the ‘BIAS SAFETY INTERLOCK’ plug on the analyzer rear panel. Details of this feature can be found in section 4.2.7—Safety Interlock. The safety interlock plug is supplied with the unit and must be inserted to use the bias current feature.

3.3 Rack Mountings

This instrument is intended for use either on the bench or in a rack. The power modules are convection cooled and care must be taken not to restrict any of the air paths.

There is a rack mounting kit available as an optional extra to fit a standard 19" rack. This kit contains the mounting ‘ears’ and screws required for the conversion. To fit these ‘ears’ carefully remove the insert in the outer face of both front handles, see Figure 3-1 below. Fit each ‘ear’ into the recess formed by the removal of the insert and secure using the bolts provided (M4 x 10mm CSK). It is important that some provision is made to support the rear of the unit when using the rack mounting ears.



Insert small screwdriver into the gap between insert and handle body. Prise away one end slightly and hold in position with finger. Note operation of insert with styling cut-out opposite cut-out in handle.

Insert screwdriver into other end and repeat procedure. This will relieve the small tapered pins of the insert from the threaded holes in the handle. Remove insert in the direction of arrow.

Insert rack mounting bracket into recess in handle in attitude shown and secure firmly with 4 M4x10 C'SK HD screws supplied.

Figure 3-1 Procedure for Attachment of Rack mounting brackets

3.4 Analyzer/3265B or 3265BQ/25A Interconnection

To perform measurements with the analyzer/3265B system, the units must be linked together.

1) Position the analyzer on top of the 3265B.

Front Panel Connections

2) Link the analyzer BNCs to the top four BNCs on the 3265B using short coaxial leads.

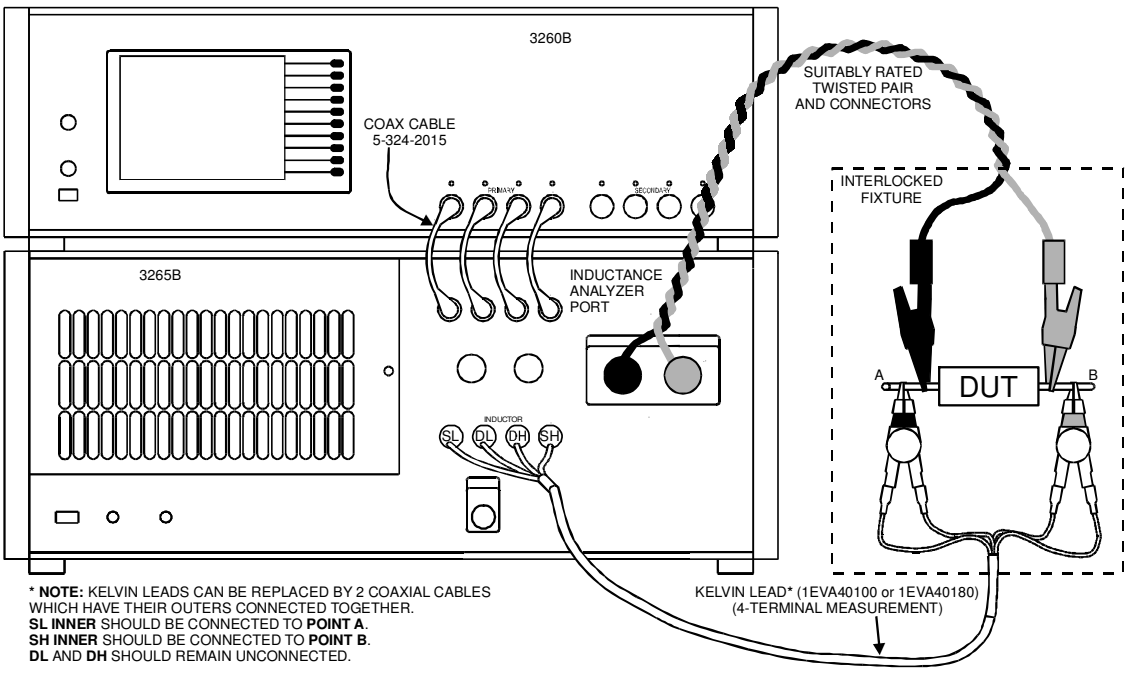


Figure 3-2 Front Panel Connections for 4-Terminal Measurement (3260B)

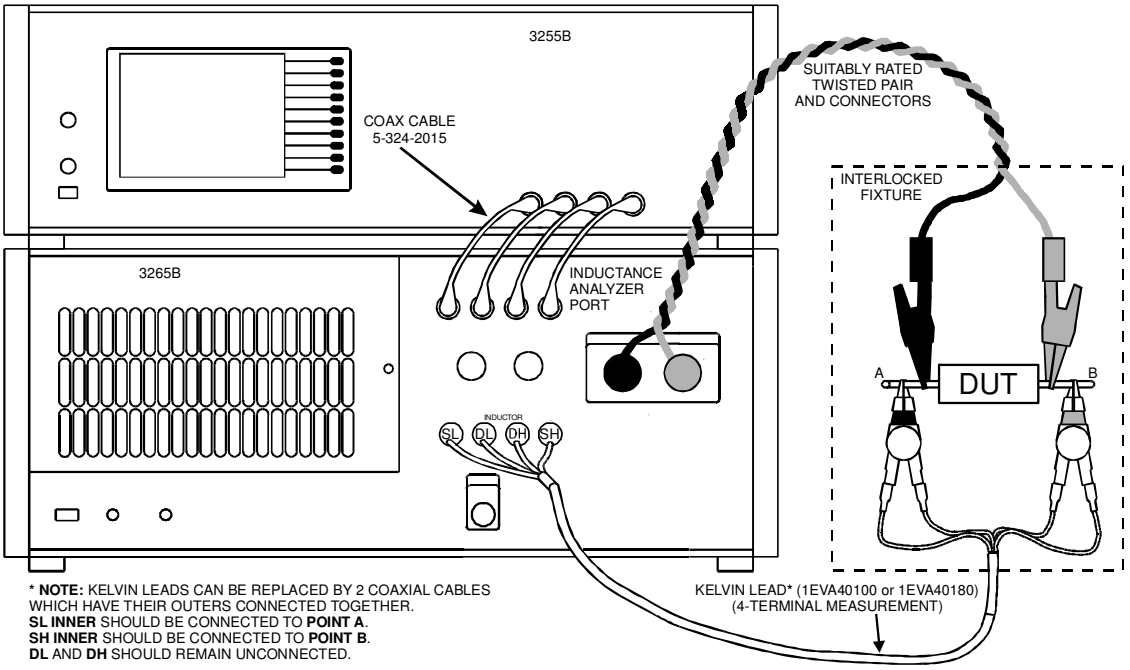


Figure 3-3 Front Panel Connections for 4-Terminal Measurement (3255B)

Rear Panel Connection

3) Connect the analyzer ‘Auxiliary Control Out’ 9-way ‘D’ connector to the 3265B ‘Aux Control In’ 9-way ‘D’ connector using the control link cable supplied.

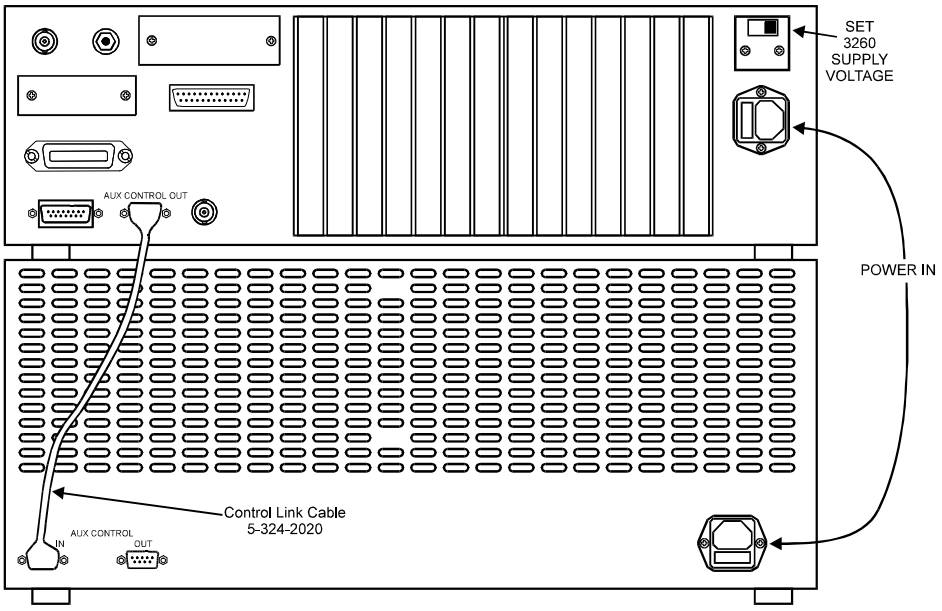


Figure 3-4 Rear Panel Connection

3.5 Using Multiple 3265s or 3265BQ/25As

Up to five 3265B or two 3265BQ/25A units can be connected together in parallel as follows.

1) Position the analyzer on top of the 3265B units (see section 3.5.1—Maximum Stacking Height).

2) Connect the analyzer to the first 3265B as described in section 3.4 above.

Front Panel Connections

3) Link the ‘Bias Current’ terminals of each 3265B to the 3265B below it with the power transfer bus bars supplied (+ to +, - to -).

4) Connect the ‘Bias Unit Link’ terminal of each 3265B to the ‘Inductance Analyzer Port’ RED terminal of the 3265B below it.

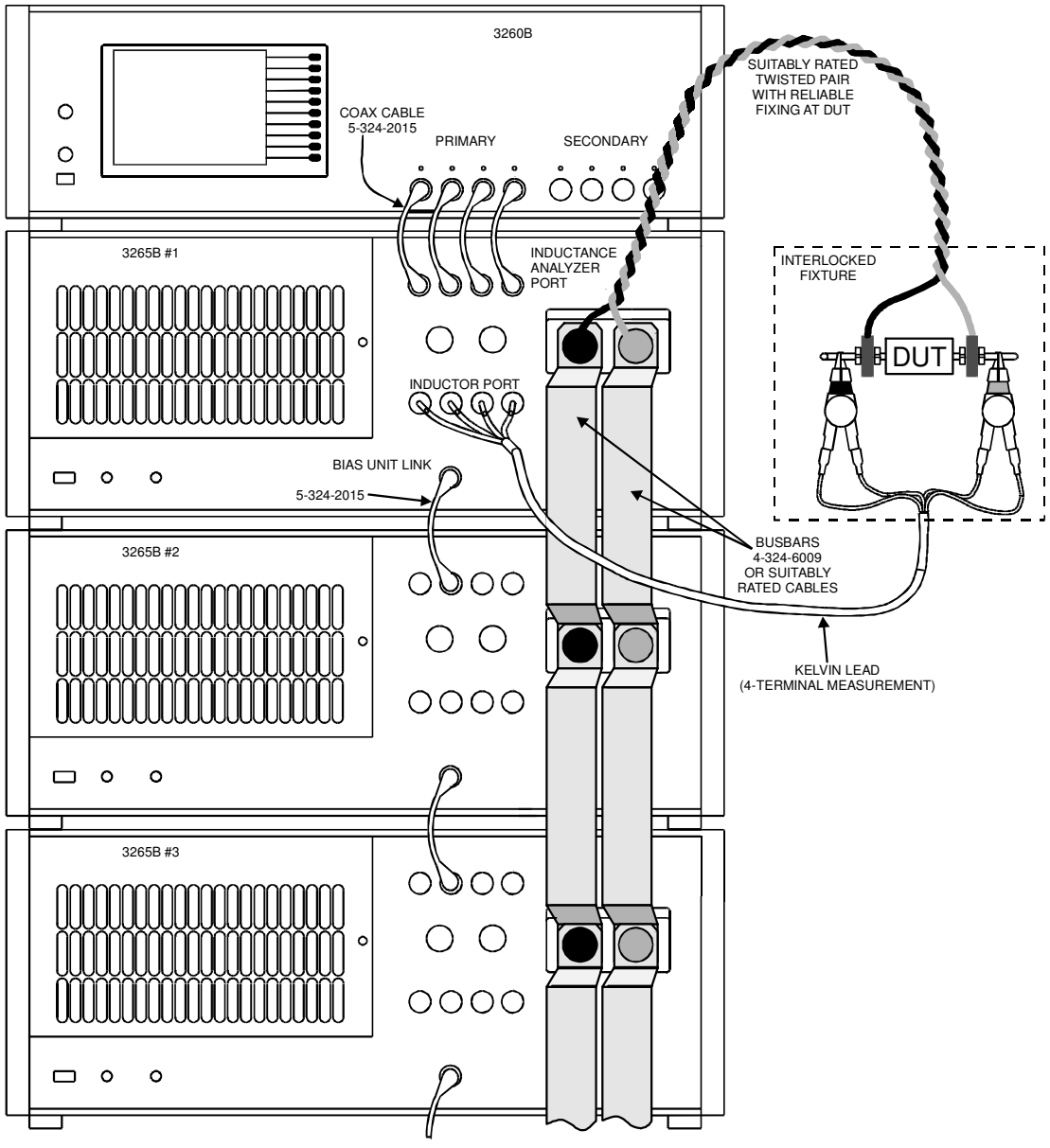
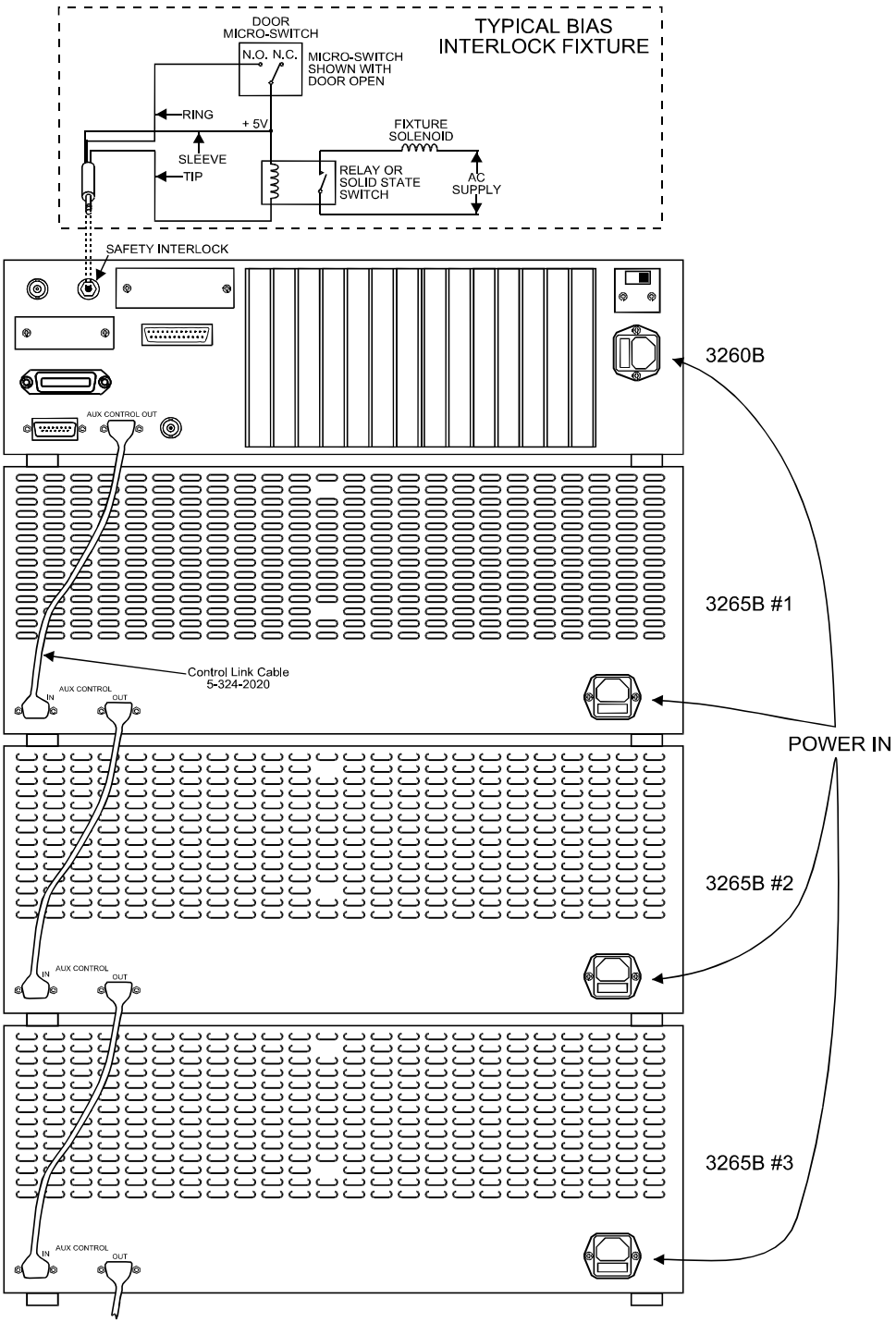


Figure 3-5 Front Panel Connections for Multiple 3265B Units

Rear Panel Connections

5) Connect the ‘Aux Control Out’ 9-way ‘D’ connector of each 3265B to the ‘Aux In’ 9-way ‘D’ connector of the 3265B below it.

Multiple Unit Connections (Rear)



3.5.1 Maximum Stacking Height

If more than one 3265B is being used, the instruments should be rack-mounted in a suitable ventilated enclosure.

4. OPERATING INSTRUCTIONS

Note

Use of the word ‘analyzer’ in this manual means an Inductance Analyzer 3255B or a Precision Magnetics Analyzer 3260B.

4.1 Basic Features

The 3265B 25A bias unit extends the range of DC bias available when measuring inductance with the analyzer.

One 3265B can provide a bias current in the range 25mA to 25A. Up to five 3265B units can be connected in parallel, to give a maximum bias current of up to 125A (limited to two units and 50A for the 3265BQ/25A), provided that the maximum voltage drop does not exceed the maximum compliance voltage.

Operation of the 3265B is via the analyzer. All of the analyzer measurement modes may be used to the full, including the internal 1A bias supply when the high current bias is not required, without disconnecting the 3265B from the analyzer.

The safety interlock system on the analyzer, designed for use with enclosed fixtures which can reduce the risks associated with high currents and large inductors, is also effective with the 3265B, see section 4.2.7—Safety Interlock.

4.2 Operation

With the analyzer and 3265B units connected together, select BOOST mode to allow the high DC bias current to drive the Device Under Test (DUT).

Press the ◄ and ► keys to move the main cursor (highlighted item) to NORM. Press ▲ or ▼ keys to toggle between NORM and BOOST. Check the control link and power supply cables on the 3265B if it will not toggle.

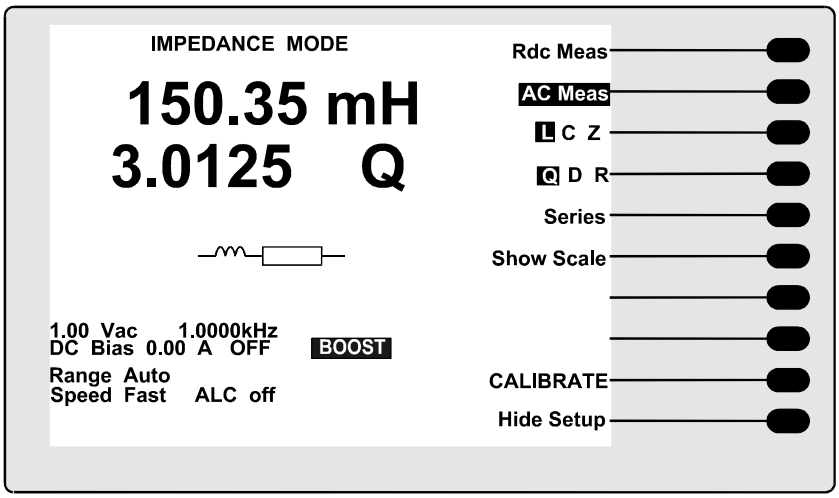


Figure 4-1 Impedance Mode with High DC Drive (3260B)

4.2.1 Boost, or High Current Operation

When BOOST mode is selected, the device to be tested should be connected to the two high current stud terminals on the front of the 3265B with cable capable of carrying the required DC bias current. It is important, especially when the inductive energy stored in the DUT exceeds a few Joules, to reduce the risk of the high current leads falling off by using ring crimps at the 3265B, and a reliable fixing arrangement at the DUT.

4.2.1.1 Measurement Restrictions

The drive level chosen on the analyzer must not be too high, otherwise the 'excess voltage drop' condition will occur. The maximum DC voltage the 3265B will permit is approximately 11.0V below 12kHz, and 10.0V above 12kHz. This is to allow for the DC voltage drop across the DUT when the bias current is flowing. However, below 12kHz, the AC drive signal from the 3265B must also be taken into account.

For example, if the drive level is 1V rms, below 12kHz, the maximum DC drop is: $11 \cdot 0 - \left(1 \times \sqrt{2}\right) = 9 \cdot 59\text{V}$

4.2.1.2 Four-Terminal Operation

Four-terminal operation is required to achieve the specified accuracy at frequencies above 1kHz. For four-terminal operation, ensure the 3260B is switched to four-terminal mode.

Connect the two outer BNC connectors on the 3265B inductor port (YELLOW and BROWN) via screened coaxial leads to the DUT. It is important to ensure that the YELLOW lead is connected to the same point on the DUT as the RED or '+' high current lead from the 3265B, and that the BROWN lead is connected to the same point as the BLACK or '-' lead from the 3265B. There are no hazards associated with these measurement leads falling off.

If desired, the measurement connections can be made using a standard four-wire Kelvin lead set. The inner two coaxial leads are internally disconnected by the 3265B when in BOOST mode.

Note:

1) It is not possible to set the 3255B to 2- or 4-terminal connection. This is automatically applied by the analyzer according to the mode and parameters selected, and the test lead/fixture configuration.
2) All four, short coaxial linking leads, to the analyzer must remain connected.
3) The measurement accuracy can only be achieved if these four leads are kept short.

4.2.1.3 Two-Terminal Operation

This measurement mode gives good results at lower frequencies. This is because any wiring from the 3265B terminals to the DUT is included in the measurement. Best results will be obtained by performing the trims at the DUT.

For two-terminal mode, no connections are required to the lower four BNC connectors on the 3265B. For two-terminal operation, ensure the analyzer is switched to two-terminal mode (see section 4.2.1.2 Note: 1).

4.2.1.4 Setting the Bias Current.

To determine the maximum DC bias current available, the analyzer will automatically detect the presence and number of bias units connected. Select the **INSTRUMENT STATUS** page (3255B) or **SETTINGS** page (3260B) to confirm the figure, e.g. three units will indicate 75A.

To set the bias current, highlight the DC Bias measurement condition, key in the required level and the analyzer will determine the nearest available DC current. On the analyzer, the ▲ or ▼ keys can be pressed and held, to step along the pre-determined steps. Note that the step size is dependent on the number of bias units connected..

High DC BOOST is only available in **MEASUREMENT** or **IMPEDANCE MODE**. NORM DC bias must be re-selected before the mode can be changed.

4.2.2 NORM, or NORMAL Operation (No High Current Bias)

When NORM DC bias mode is selected, all functions available to the stand-alone analyzer are supported and the internal 1A bias supply is used. The system design and lead configuration, allow users to maintain the system integrity and to use normal operations without high DC current Bias. Full accuracy is maintained.

4.2.3 Calibration and Trims

If DC bias BOOST mode is selected, pressing the Calibrate soft key will enter 'EXT BIAS CALIBRATE MODE'. O/C Trim, S/C Trim and HF Lead Compensation (when used with 3260B only) functions are provided to eliminate the effects of stray capacitance, series impedance and lead length of the connecting leads or fixture.

The 3265B trim values are stored in non-volatile memory in the analyzer and are separate from the internal trim values. Therefore, it is possible to carry out a four-terminal NORMal trim and a two-terminal BOOST trim and then make measurements between these two modes without re-trimming.

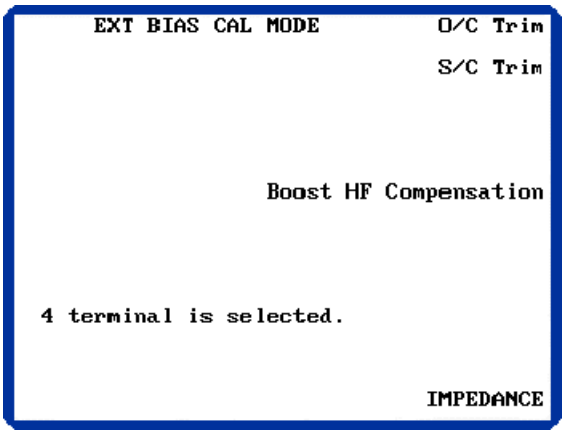


Figure 4-2 External Bias Calibration Mode

4.2.3.1 Open and Short Circuit Trimming

The following diagrams show connections for open-circuit and short-circuit trimming in two-terminal and four-terminal configurations.

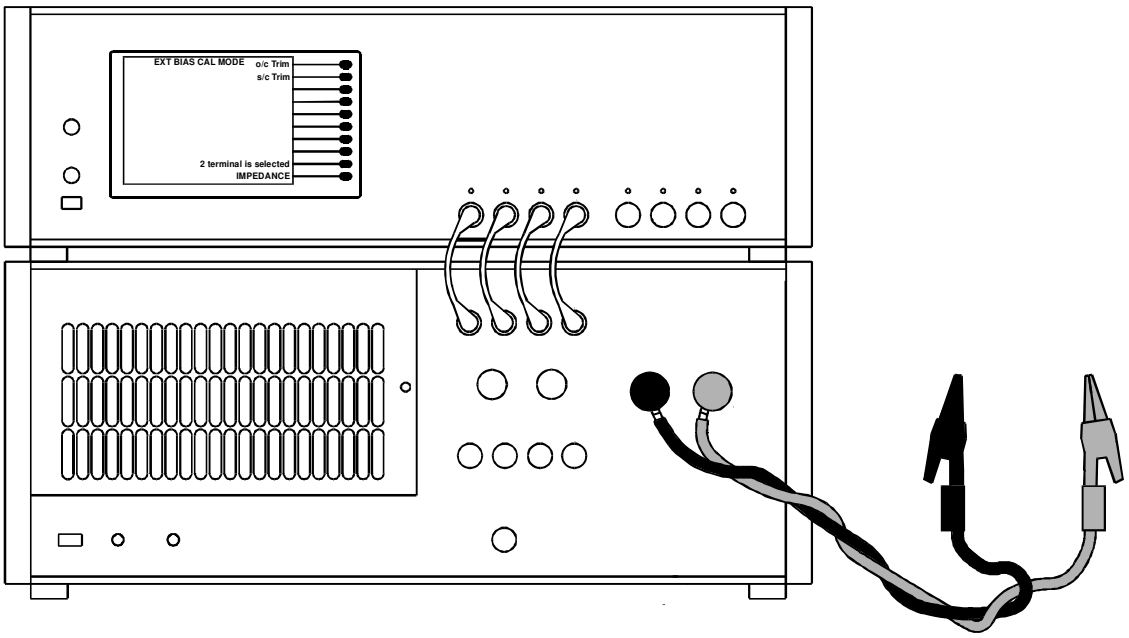


Figure 4-3 Connections for Open-Circuit Trimming (Two-Terminal)

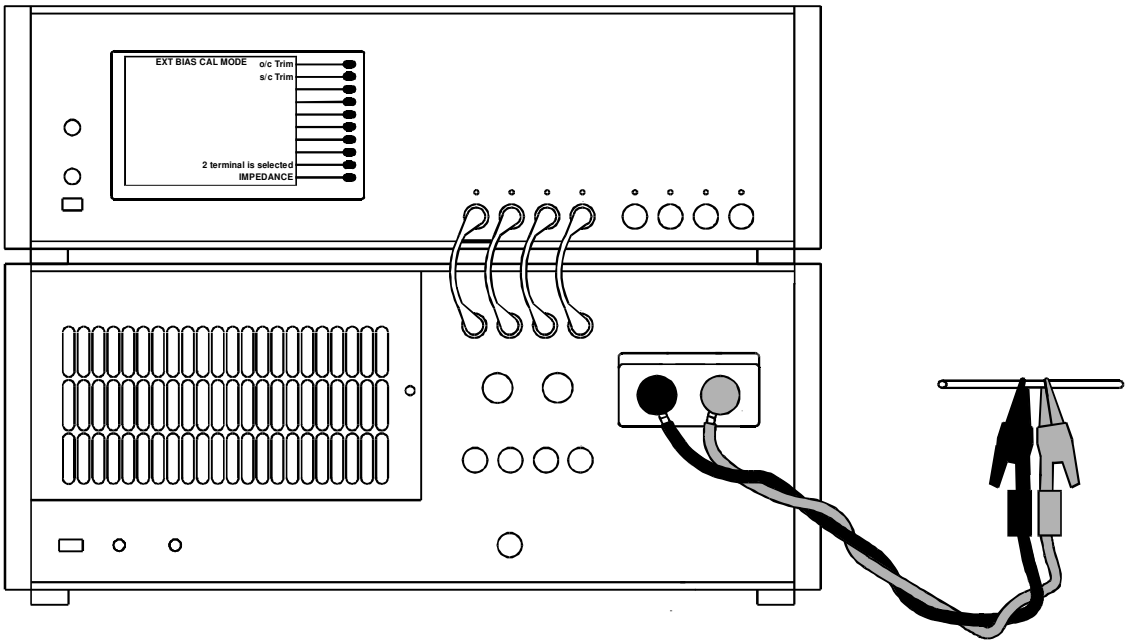


Figure 4-4 Connections for Short-Circuit Trimming (Two-Terminal)

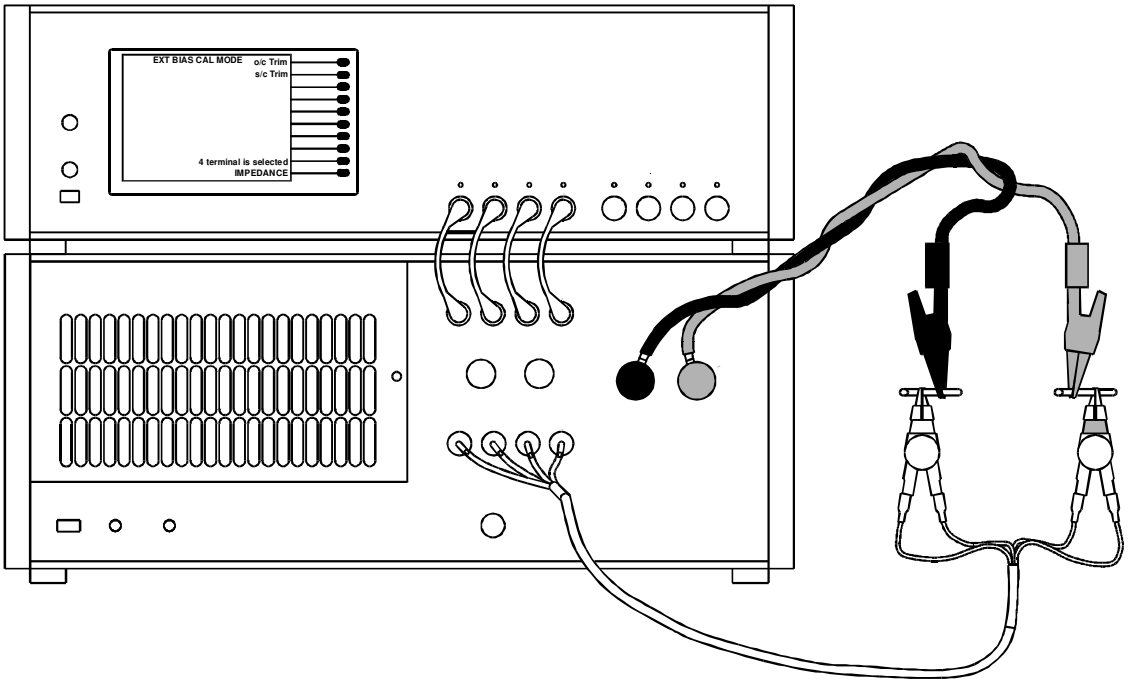


Figure 4-5 Connections for Open-Circuit Trimming (Four-Terminal)

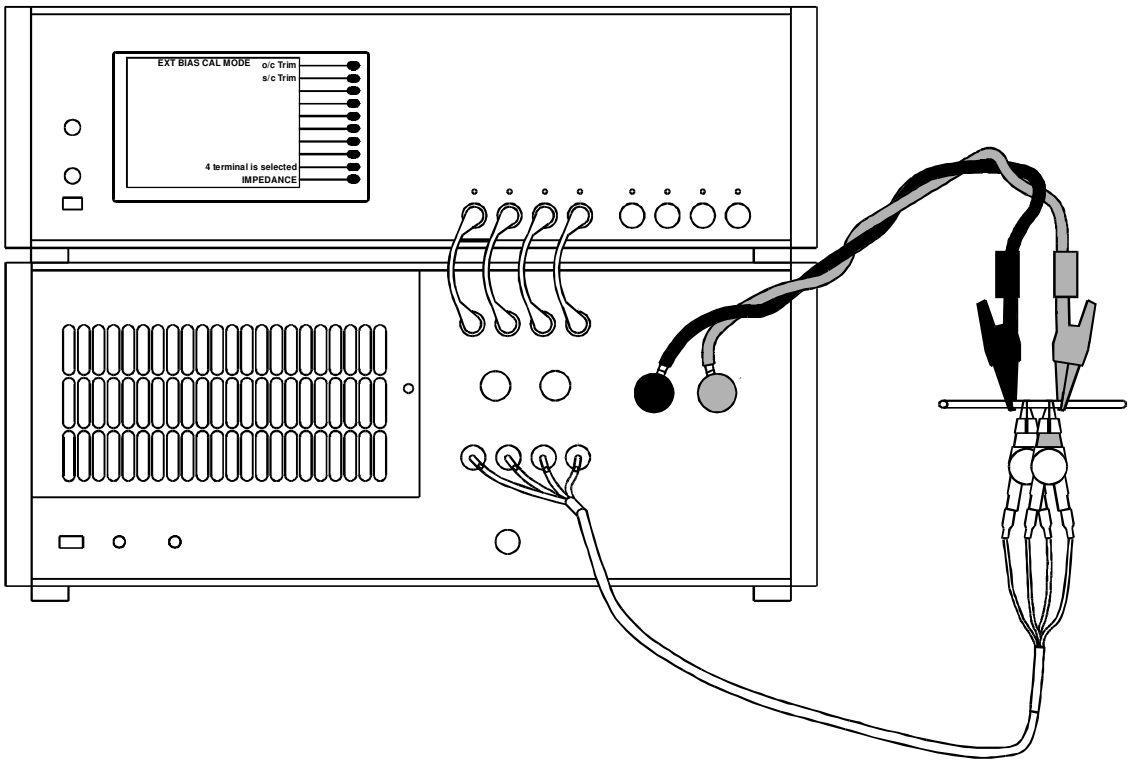


Figure 4-6 Connections for Short-Circuit Trimming (Four-Terminal)

4.2.3.2 HF Lead Compensation

When operating at frequencies > 500kHz (only applies when using a 3260B), it is recommended that HF Lead compensation be applied. This function compensates for errors introduced by long leads at high frequencies and uses the Transfer Standard Capacitor supplied with the 3260B (3260TS).

Before the HF Compensation routine is run, both the O/C and S/C trim routines must be performed as described in the previous section.

Having run the O/C and S/C trims, connect the Transfer Standard capacitor between the test leads and press 'HF Lead Compensation'. The analyser will run the compensation routine and return to the Calibrate page when complete.

Note: Lead movement should be kept to a minimum especially when measuring low value inductors. It is recommended that a fixture such as the 1J1009 is used, as this removes any effects due to lead movement, helping to produce repeatable results.

4.2.4 Making Measurements

Ensure that Bias is switched OFF. Connect a coil to be measured to the leads, as described in Section 4.2.1.2 or 4.2.1.3, depending on whether 2- or 4-terminal measurement is required. To minimize measurement noise, select maximum AC drive and Slow speed where practical. Switch the Bias ON and then trigger measurements.

Operation of the analyzer with one or more 3265Bs, is similar to that for a stand-alone analyzer. Rdc facility is not available with DC bias. However, switching between Rdc and AC measurements is permitted although DC bias will be turned OFF and will not be turned ON automatically.

If the measurement frequency is increased from below 12kHz or decreased from above 12kHz with DC bias applied, the current will be ramped down before the change in frequency and ramped back to the desired value after changing the frequency.

4.2.5 Messages

Message	Condition
Ext Bias Faults	A bias unit has developed a fault, or the power to a bias unit has been switched off.
Ext Bias unplugged	The ribbon cable from the analyzer to the bias units has fallen off and disconnected all of the bias units.
Ext Bias Mismatch	One or more (but not all) bias units are disconnected. The message will be extinguished when the fault is cleared.
Setting DC Bias **Turning Bias Off**	DC bias is being ramped up. DC bias is being ramped down. The message will be extinguished when the correct current level is established.

Message	Condition
Excess Voltage Drop	Excessive DC voltage across the DUT. This may be avoided by reducing the bias level and/or reducing the AC drive level.
SAFETY **Bias Turned Off**	An excess voltage across the DUT has been allowed to persist for 10 seconds The analyzer will remove the DC bias current.
Source Failure **Load Disconnect** **Over Temperature** **Bias Power failure**	Critical fault conditions. The analyzer will remove the DC bias current.

Figure 4-7 Messages

4.2.6 GPIB Operations

Use GPIB Commands for **MEASUREMENT/IMPEDANCE MODE** to control the 3265B bias units and make measurements. The following extra commands are described in detail.

Impedance	Description	Query
:IMP:BIAS INT or EEXT :MEAS:BIAS INT or EEXT	Select INTernal or EXTernal DC bias drive. :IMP:BIAS EEXT or :MEAS:BIAS EEXT command will set the system to DC Bias BOOST mode. Bias status query. Returns bias status in 3 integers delimited with colons. The first integer 0 or 1 is corresponding to OFF, ON respectively. The second integer 0 or 1 is corresponding to INT, EXT respectively. The third integer is the number of bias units connected in the system.	:IMP:BIAS-STATus? :MEAS:BIAS-STATus?
:IMP:BIAS ON or OFF :MEAS:BIAS ON or OFF	Turn DC bias ON or OFF. Bias status query. Returns bias status in 3 integers delimited with colons.	:IMP:BIAS-STATus? :MEAS:BIAS-STATus?
:IMP:BIAS <value> :MEAS:BIAS <value>	Set DC bias <value> if 'AC Meas' selected. <value> is decimal numeric data. Suffix A is optional. Bias query. Return bias in A as floating point number.	:IMP:BIAS? :MEAS:BIAS?

Figure 4-8 GPIB Operations

4.2.7 Safety Interlock

For reasons of safety, an interlock feature is incorporated into the analyzer. This prohibits any DC BIAS current until the safety interlock circuit is complete with the safety jack plug fitted.

For maximum operator safety, particularly on production line testing, it is advisable to place the terminal fixture for the inductor under test, within a housing with an interlocked door. The interlock jack connections are shown below in Figure 4-9.

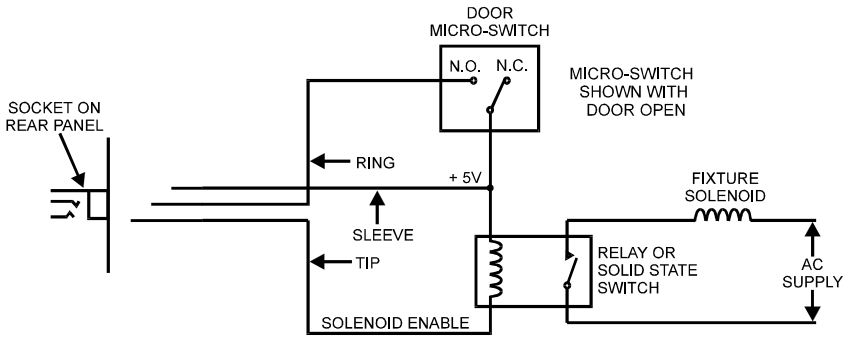


Figure 4-9 Typical BIAS interlock fixture

Only when the door is closed and the micro switch therefore made, can the DC BIAS be activated. At this time, the relay is energized, activating an AC supply for a solenoid which can be used to lock the door while the BIAS remains available.

The solenoid drive relay should have a 5V DC coil of resistance not less than 200Ω. Diode coil protection is provided within the BIAS circuitry.

The door lock is activated when BIAS ON is selected on the instrument. If the door switch or interlock lead is broken, the DC bias is inhibited.

IMPORTANT

If the Interlock feature is not required, it is necessary to insert the 3.5mm jack connector, with the ring and sleeve connections linked, into the socket on the back panel. Failure to do this will result in the BIAS being inhibited, and the message, ⁎ Bias Interlock ⁎ being displayed.

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5. SPECIFICATION

5.1 Analyzer Measurement Facilities

For a full description of facilities and specification see the 3255B/3260B user manual.

All the measurement facilities of the analyzer are available with the following exception.

Rdc **Transformer Measurements**	Not available when DC bias current is applied.

5.2 Facilities

DC Bias Current	25mA to 25A in 0.025A steps. – 3265B/25A and 3265BQ/25A 25mA to 20A in 0.025A steps. – 3265B/20A 25mA to 10A in 0.025A steps. – 3265B/10A 25mA to 5A in 0.025A steps. – 3265B/5A Up to five 3265B units can be connected in parallel, to give a maximum bias current of up to five times a single bias unit 125A, provided that the maximum voltage drop does not exceed the compliance voltage. 3260B and 3255B/A have an internal bias function giving current steps of 1mA, up to 1A.	
DC Bias Current Accuracy	□1% of set bias current.	
Compliance Voltage	10V DC max at 1V AC drive level (f < 12kHz) 11V DC max at 0.25V AC drive level (f < 12kHz) Where f > 12kHz, deduct 0.5V	
Frequency Range	3255B	20Hz to 500kHz
	3260B	20Hz to 1MHz

5.3 Accuracy Chart

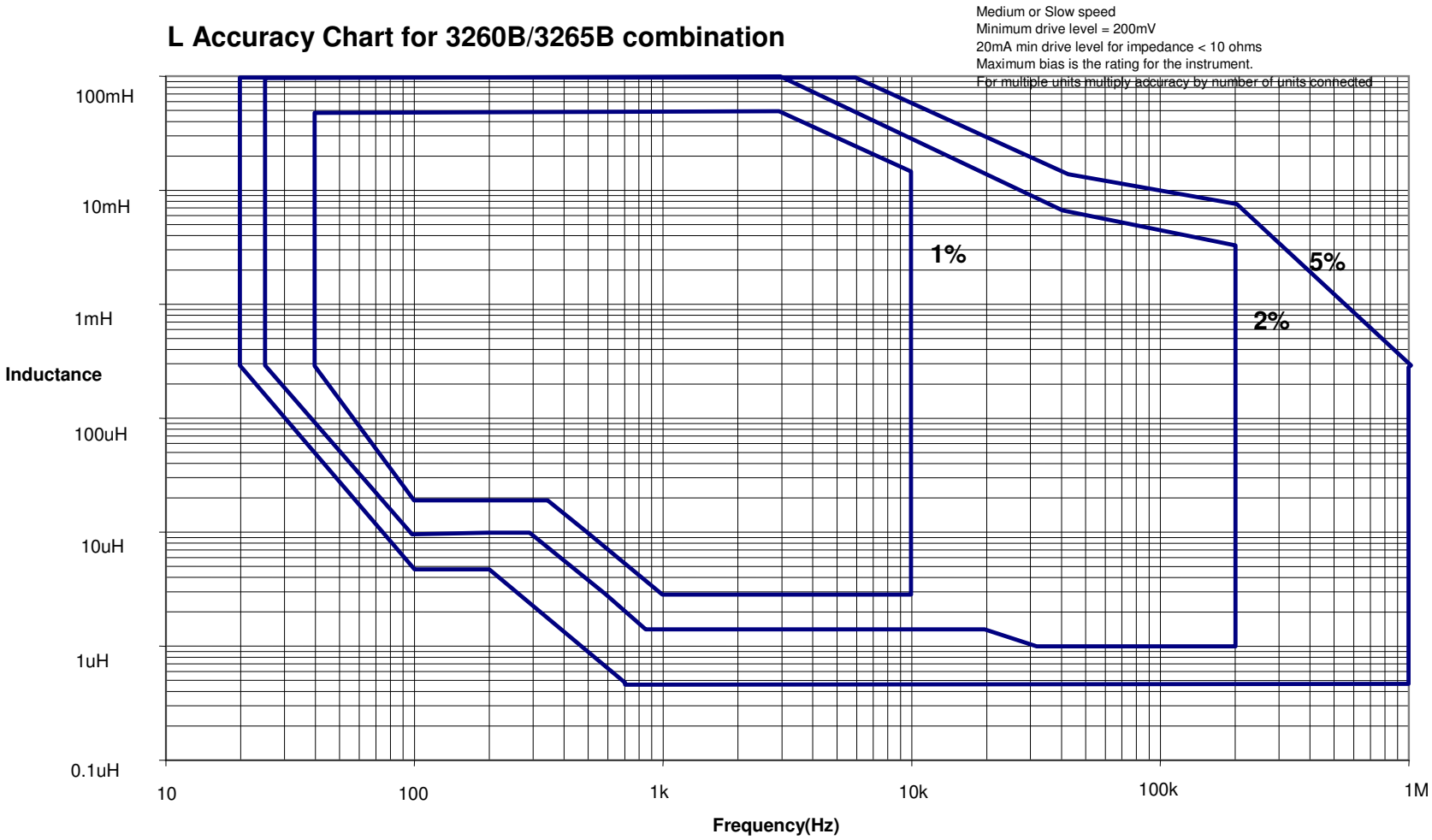

Figure 5-1 Accuracy Chart 3265B – All models

5.4 3265BQ/25A Facilities

Note The 3265BQ/25A requires a 3260B fitted with firmware version 5.3 or later.

DC Bias Current	25mA to 25A in 0.025A steps. Up to two 3265B units can be connected in parallel, to give a maximum bias current of up to 50A, provided that the maximum voltage drop does not exceed the compliance voltage. 3260B and 3255B/A have an internal bias function giving current steps of 1mA, up to 1A.	
Accuracy	±1% of set bias current.	
Compliance Voltage	10V DC max at 1V AC drive level (f < 12kHz) 11V DC max at 0.25V AC drive level (f < 12kHz) Where f > 12kHz, deduct 0.5V	
Frequency Range	3255B	20Hz to 500kHz (model dependant)
	3260B	20Hz to 3MHz

5.5 3265BQ/25A Accuracy Data

Measurement conditions: 1009 test fixture, 1V/20mA drive level, Slow speed, Spot frequency trims, HF compensation applied for frequency >1MHz.

Frequency	**Bias Current**	
	Up to 25A	**Up to 50A (2 x 3265BQ/25As)**
< 1MHz	Same as 3265B	Same as 3265B
> 1MHz	L<=10µH, ±10% ±20nH	L<=10µH, ±20% ±40nH

5.6 General Data

5.6.1 Input Specification

Input Voltage	90 to 255V AC
Frequency	47 to 63Hz
Input Current	9A RMS max
Power Factor	> 0.9
Input fuse rating	10A ‘T’ type, 5 x 20mm HRC The input fuse is the fuse holder drawer integral to the IEC input connector.
Power-up	3265B powers up automatically when connected to a powered analyzer. Isolating switch provided.

5.6.2 Measurement Connections

4 BNC terminals to connect to the analyzer with coaxial cable.

4 BNC terminals to connect with the device under test (DUT) with Kelvin Leads.

DC bias current to connect to the DUT via two M8 studs. Use heavy duty cable (twisted) compatible with the maximum current applied.

Two Terminal Measurement	Via M8 studs
Four Terminal Measurement	Via Kelvin Leads and M8 studs

Measurement terminals are internally protected against normal inductor back-emf or accidental disconnection of inductor by two 1.6A fuses. These are easily accessible from the front panel.

5.6.3 Control Connections

I^2C bus link controls application of DC current and monitors status of 3265B. Status data includes 'Excessive Voltage Drop' and 'Overtemperature'.

5.6.4 1009 High Current Fixture (Optional)

The 1009 high current fixture enables a DC bias current of up to 50A to be applied to an inductor during component test.

The 1009 bias interlock cable connects the 1009 lid safety interlock mechanism to the analyzer safety interlock ensuring operator safety by removing DC bias current when the fixture lid is opened.

5.6.5 Environmental Conditions

Altitude	Altitude up to 2000m
Relative Humidity	up to 80% non conducting.
Installation category	II (in accordance with IEC664)
Pollution degree	2 (mainly non-conductive)

This equipment is intended for indoor use only in a non-explosive, non-corrosive atmosphere.

5.6.5.1 Temperature

Storage	-40°C to +70°C (-40°F to +158°F)
Operation	0°C to +40°C (32°F to +104°F) (20A max)
Full accuracy	+15°C to +30°C (59°F to +86°F) (25A max)

5.6.6 Safety

Bias safety interlock on rear panel of measuring instrument provides door lock and closed control lines.

Designed to meet the requirements of EN61010-1.

5.6.7 EMC

Complies with EN50081-1, EN50082-1 generic emissions and immunity standards by meeting with the requirements of EN55022, EN61000-4-2, EN61000-4-3, EN61000-4-4.

Note:

When subjected to a significant electrostatic discharge (in accordance with EN61000-4-2), the analyzer may reset itself. If a bias current is being applied (either from the 3265B or the analyzer), this will be removed as part of the reset procedure. This ensures the safety of the operator under normal and test conditions. Please read section 1—Safety before using this instrument.

5.6.8 Mechanical

Height	190mm ($7^1/_2$")
Width	440mm ($17^3/_8$")
Depth	520mm ($20^1/_2$")
Weight	15kg (33lb)
Cooling	Fan cooled: intake front, exhaust rear. Fan filter accessible on front panel. Overtemperature trip provided.

5.6.9 Panel Symbols Used

	Refer to handbook.
	Alternating current
	Earth (ground) terminal
	CAUTION - Risk of electric shock.
	On
	Off

Figure 5-2 Panel Symbols

6. MAINTENANCE, SUPPORT AND SERVICES

6.1 Guarantee

The equipment supplied by Wayne Kerr Electronics is guaranteed against defective material and faulty manufacture for a period of twelve months from the date of dispatch. In the case of materials or components employed in the equipment but not manufactured by us, we allow the customer the period of any guarantee extended to us.

The equipment has been carefully inspected and submitted to comprehensive tests at the factory prior to dispatch. If, within the guarantee period, any defect is discovered in the equipment in respect of material or workmanship and reasonably within our control, we undertake to make good the defect at our own expense subject to our standard conditions of sale. In exceptional circumstances and at the discretion of the service manager, a charge for labour and carriage costs incurred may be made.

Our responsibility is in all cases limited to the cost of making good the defect in the equipment itself. The guarantee does not extend to third parties, nor does it apply to defects caused by abnormal conditions of working, accident, misuse, neglect or wear and tear.

6.2 Maintenance

6.2.1 Cleaning

The body of the equipment can be cleaned with a damp lint-free cloth. Should it be required, weak detergents can be used. No water must enter the equipment. Do not attempt to wash down internal parts.

6.2.2 Safety Checks

Each year the equipment should be given a simple safety check.

6.2.2.1 Equipment required

25A ground bond tester (e.g. Megger PAT 2)

Insulation tester @ 500V DC (e.g. Megger BM 7)

6.2.2.2 Tests

1) **DISCONNECT THE INSTRUMENT FROM THE AC POWER SUPPLY!**
2) Inspect the unit and associated wiring for damage, e.g. dents or missing parts which might impair the safety or function of the equipment. Look for any signs of overheating or evidence that objects might have entered the unit.
3) **Ground Bond:** Ensure that 25A DC can flow from exposed metal parts of the unit (not BNC connector outers) to ground with an impedance of less than 100mΩ.
4) **Insulation Test:** Connect the Live and Neutral of the power cable together and test the insulation between this point and the ground at 500V DC. Readings greater than 1MΩ are acceptable.

6.3 Support and Service

In the event of difficulty, or apparent circuit malfunction, it is advisable to contact the service department or your local sales engineer or agent (if overseas) for advice before attempting repairs.

For repairs and recalibration it is recommended that the complete instrument be returned to one of the following:

USA

Wayne Kerr Electronics Inc.
165L New Boston Street
Woburn MA 01801-1744

Tel: +781 938 8390
Fax: +781 933 9523
Email: sales@waynekerr.com
service@waynekerr.com

UK

Wayne Kerr Electronics
Vinnetrow Business Park
Vinnetrow Road
Chichester
West Sussex PO20 1QH
Tel: +44 (0)1243 792200
Fax: +44 (0)1243 792201
Email: sales@wayne-kerr.co.uk
service@wayne-kerr.co.uk

Europe

Wayne Kerr Europe
Märkische Str. 38-40
58675 Hemer
Germany

Tel: +49 (0)2372 557870
Fax: +49 (0)2372 5578790
Email: info@waynekerr.de
service@waynekerr.de

Asia

Wayne Kerr Asia
A604 Pengdu Building,
Guimiao Road,
Nanshan District,
Shenzhen, Guangdong
China
Tel: +86 130 66830676
Fax: +86 755 26523875
Email: sales@waynekerr.com
service@waynekerr.com

When returning the instrument please ensure adequate care is taken with packing and arrange insurance cover against transit damage or loss. If possible re-use the original packing box.

INDEX