LCR Meters

4260, 4265, 4270

Wayne Kerr
Electronics Ltd

Providing low cost, straightforward and accurate measurement of components - in a service, production or laboratory environment.

Three low cost versatile models - the 4270, 4265 and 4260 - offer a combination of powerful capabilities to meet the most demanding requirements, quickly and effectively.

Features

- Comprehensive measurement functions, including DC Resistance
- Test components to 1MHz
- Large LCD display, with easy-to-read characters
- 0.1% basic accuracy
- IEEE-488 or RS-232 interface
- DC Voltage bias
- 9 instrument setups stored
- Display of actual Voltage and Current measurement
- Automatic zero trim
- Contact check
- Deviation measurement mode
- Directly print measured data

High performance... excellent value for money

The 4200 series combines superior performance, measurement functions and a low price providing unbeatable value for money. Operation is simple and straightforward with measurements undertaken at a wide range of test frequencies and voltage levels. Features include a choice of interfaces - IEEE-488 or RS-232, comprehensive measurement functions, including DC Resistance, a bin handling capability and component characterisation to 1 MHz.

Fast, accurate, repeatable measurements

Testing electronic components with Wayne Kerr LCR meters is easy, and in less than a second you'll see all you need to know on the large, easy-to-read LCD display. The dominant component value can be measured with a basic accuracy of 0.1% and displayed with its equivalent circuit diagram. Measurement integrity is further enhanced with the use of Kelvin leads or test posts which connect directly onto the instrument's front panel.

Comprehensive measurement functions to suit all requirements

The 4200 series LCR meters offer a comprehensive range of measurement functions: series and parallel resistance (Rac), DC resistance (Rdc), capacitance (C), inductance (L), impedance (Z), phase angle (ø), dissipation factor (D) and quality factor (Q) can all be selected. An internal DC bias source is provided for testing components such as electrolytic capacitors and semiconductor junctions.

For the un-skilled user, just connect the component you want to test into the test posts and the LCR meter will automatically sense the type of component being tested and display the characteristic parameters and equivalent circuit on the large LCD display. To get a more stable reading you can use the averaging function. For fast comparison of components, the 4270 also offers a deviation mode.

Select the current/voltage monitoring function to see the actual test current and voltage values measured at the component under test. This ensures maximum protection for current-sensitive components and allows the test current to be specified together with the measured component parameters.

Quick and simple component connection

Connection of test components is quick and simple; either directly to the detachable test posts which are conveniently located on the front panel, or using the 9542A universal test adapter. The optional 9541B test cable with Kelvin clips provides a unique solution for flexible attachment to mounted components while retaining the extra accuracy of the 4-wire measurement principle.

Surface-mount devices (SMDs) are also handled quickly and efficiently, using the optional SMD accessories. All measurements are made using a 4-wire technique which ensures accurate and repeatable measurements - even for low-impedance components.

Precise component characterisation to 1 MHz

The 4270 and 4265 have the widest choice of test frequencies. For testing primary power components such as transformers and filter capacitors, these instruments have 50 and 60 Hz test frequencies together with the 100 and 120 Hz ripple frequencies. In the 100 Hz to 20 kHz range, both LCR meters provide 100 Hz resolution for precision frequency characterisation. For testing small value capacitors, 100 kHz is also provided in the 4265, while the test frequency of the 4270 is continuously adjustable up to 1 MHz.

Component test voltage levels are variable from 2V right down to only 50 mV, to keep sensitive semi-conductor junctions below their voltage thresholds. DC bias can be added, either from the built-in source or from an external source up to 40 V DC.

Wide accessory range for easy connection to a variety of components

Testing surface-mount devices has always been a challenge because of their size, no wire leads, and tiny or no markings. These factors make it more important to be able to test SMD components to control their quality and prevent misloads in a manufacturing environment. The Wayne Kerr accessories for SMD testing are uniquely designed and allow fast, convenient and accurate characterization of these components.

Automatically sorts components with different tolerance levels

The binning function allows components to be sorted into ten bins. By inserting the component in the test fixture, the indicated bin number can be read from the display. The optional handler interface provides lamp drivers for a visual indication of the proper bin, or a pass/fail indication, along with an external measurement trigger input, further speeding up the sorting process.

Flexible, full remote control

With the IEEE-488 interface, the 4270 and 4265 can become the heart of a fully automated component testing environment for operation at up to 10 measurements per second. Or with the RS-232 interface, the tester can be controlled simply and economically from a PC in a standalone system for incoming inspection of components and devices.

Produce a hard copy of measurement results

Using the RS-232 interface measurement results can be output directly to a printer.

Suitable for all environments

With so many built-in capabilities, the compact and versatile Wayne Kerr 4200 series LCR meters can be used in service, laboratory or production environments. And with the best measurement versatility and value in their class, they are sure to prove a valuable addition where low cost straightforward testing is required and component accuracy and reliability are essential.

LCR Meters
4260 4265 4270

Products at a glance

The Wayne Kerr 4200 series comprises three models to meet a wide range of performance and budget requirements:

4270 Automatic LCR Meter DC - 1 MHz

The 4270 is the most versatile LCR meter in the family. It allows testing at any frequency up to 1 MHz, variable AC and DC test voltages, deviation mode and is capable of handling a wide variety of components under realistic test conditions.

4265 Automatic LCR Meter DC - 100 kHz

For testing to 100 kHz consider the 4265. It has a basic accuracy of 0.1%, 3 test voltage levels and 204 test frequencies, providing a powerful yet low cost solution to component testing.

4260 Automatic LCR Meter 1 kHz

The simplest and most cost effective solution to component testing. The 4260 has a 0.25% basic accuracy and is ideal for use in manufacturing as a quality assurance tool, or in the service lab for quick tests on a wide variety of components. It's equally at home in the classroom for education, or in training environments.

Select the Wayne Kerr LCR meter that's right for your application:

Function	4270	4265	4260
Frequency range	50 Hz – 1 MHz	50 Hz – 100 kHz	1 kHz
Measurement functions	Z, Rac, L, C, Q, D, ϕ, Vx, Ix, Δ%, Series & Parallel. Rdc (opt)	Z, Rac, L, C, Q, D, ϕ, Vx, Ix, Series & Parallel. Rdc (opt)	Z, Rac, L, C, Q, D, ϕ, Series & Parallel.
Basic accuracy	0.1%	0.1%	0.25%
AC test signal level	50 mV – 2 V	50 mV, 1 V, 2 V	2 V
DC bias (Voltage)	0 – 10 V int., < 40 V ext.	2 V int., < 40 V ext.	2 V int.
Contact check	Yes	–	–
Averaging	Yes (3 levels)	Yes	–
Deviation mode	Yes	–	–
Test signal monitoring	Current or voltage	Current or voltage	–
Remote interface	IEEE-488 or RS-232	IEEE-488 or RS-232	–

TECHNICAL SPECIFICATIONS

4260		
AC test mode		
Test frequency		1 kHz
Test frequency accuracy		0.025%
Test signal level		2V via 400 Ω source
Basic measurement accuracy		0.25% ±1 digit
DC bias		
Internal		2V
Maximum measuring ranges		
Impedance/Resistance	Z or Rac	0.000 Ω to 200 MΩ
Capacitance	C	0.0 pF to 100 mF
Inductance	L	0.0 µH to 32 kH
Quality factor	Q	0.002 to 500
Dissipation factor	D	0.002 to 500
Phase angle	ϕ	–90.0 to +90.0 deg
Maximum resolution		
Impedance/Resistance	Z or Rac	0.1 mΩ
Capacitance	C	0.1 pF
Inductance	L	0.1 µH
Quality factor	Q	0.001
Dissipation factor	D	0.001
Phase angle	ϕ	0.1 deg
Circuit diagram		
7 different equivalent circuit diagrams		
Auto mode		
Read-out		Dominant parameter
Equivalent circuit diagram		Parallel for R+C Serial for R+L
Manual mode		
Read out		Dominant or secondary parameter
Equivalent circuit diagram		Parallel or serial selectable
Measurement update rate		
2 measurements/s		
Trim function		
Open circuit		Open circuit compensation Z > 100 kΩ
Short circuit		Short circuit compensation Z < 10 Ω
Stored settings (non-volatile memory)		
Front panel settings		1 (trim figures included)
Calibration		
Calibration interval		1 year
Environmental conditions		
Operating temperature		0°C to 50°C
Storage temperature		–40°C to 70°C
Power requirements		100/120/220/240 V ±10%
Line frequency		50 to 100 Hz
Power consumption		16 VA
EMC		VDE 0871 Class B, CISPR 11
Safety		According to CE-regulation 73/23 EN61010 CAT II, CSA C22.2 No. 231
Warm-up time		5 minutes
Dimensions and weight		
WxHxD		315 x 105 x 405 mm (12.4" x 4.13" x 15.9")
Weight		3.8 kg /8.4 lb

	4270	4265
AC Test mode		
Test frequency	50, 60, 100, 120 Hz 200 Hz to 100 kHz (100 Hz steps) 100 kHz to 1 MHz (1 kHz steps)	50, 60, 100, 120 Hz 200 Hz to 20 kHz (100 Hz steps) 100 kHz
Test frequency accuracy	0.01 %	0.01%
Test signal levels	50 mV to 2 V (10 mV steps) via 100 Ω	50 mV via 100 Ω 1 V via 100 Ω 2 V via 400 Ω
Basic measurement accuracy at normal measurement mode	0.1% ± 1 digit (for ≥ 0.25 V, ≤ 50 kHz) 0.1% x (f / 50 kHz) ± 1 digit (for ≥ 0.25 V, > 50 kHz) 0.1% x (O.25 V/VT) ± 1 digit (for < 0.25 V, ≤ 50 kHz)	0.1% ± 1 digit (for ≤ 20 kHz) 0.4% ± 1 digit (100 kHz) 0.5% ± 1 digit (for 50 mV, ≤ 20 kHz) 2.0% ± 1 digit (for 50 mV, 100 kHz)
DC bias		
Internal	0 to 10 V (0.1 V steps)	2 V
External	0 to 40 V	0 to 40 V
DC Test mode (Optional)		
Test signal levels	50 mV to 2 V (10 mV steps) via 100 Ω	300 mV via 100 Ω 1 V via 100 Ω 2 V via 400 Ω
Basic measurement accuracy at normal measurement mode	0.1% ± 1 digit (for ≥ 0.25 V)	0.1% ± 1 digit (for 1 V)
Contact Check (4270 only)		-
Pass	< 3 Ω	
Fail	≥ 3 Ω (with indication of failed connection lead)	

		4270 & 4265
Maximum measuring ranges		
Impedance/ Resistance AC	Z or R_{AC}	0.0000 Ω to 200 MΩ
Resistance DC	R_{DC}	0.0000 Ω to 50 MΩ
Capacitance	C	0.00 pF to 31.8 F
Inductance	L	0.00 µH to 637 kH
Quality factor	Q	0.000 to 1000
Dissipation factor	D	0.000 to 1000
Phase angle	ϕ	–179 to +180 deg
Voltage monitor	V_X	0.1 µV to 2.00 V
Current monitor	I_X	0.005 µA to 10.0 mA
Maximum resolution		
Impedance/ Resistance AC	Z or R_{AC}	0.1 mΩ
Resistance DC	R_{DC}	0.1 mΩ
Capacitance	C	0.01 pF
Inductance	L	0.01 µH
Quality factor	Q	0.001
Dissipation factor	D	0.001
Phase angle	ϕ	0.1 deg
Voltage monitor	V_X	0.1 µV
Current monitor	I_X	0.001 µA
Circuit diagram		
Display		1 of 7 different equivalent circuit diagrams
Auto mode		
Read-out		Dominant **and** secondary parameter
Equivalent circuit diagram		Parallel for R+C, Serial for R+L
Manual mode		
Read-out		Dominant **and** secondary parameter or Z, ϕ, D, Q, V_X , I_X
Equivalent circuit diagram		Parallel or serial selectable
Average function		
Function		Exponential averaging in continuous mode
Levels		3 (and off) / 1 (and off)

	4270	4265
Deviation mode (4270 only) Relative range in respect to reference value	–100% to +100%	-
Measuring modes ***Normal*** Continuous Single	2 measurements/s Triggered via "TRIG" key, Triggered via handler interface Triggered via IEEE-488 or RS-232	
Test frequency	50, 60, 100, 120 Hz 200 Hz to 100 kHz (100 Hz steps) 100 kHz to 1 MHz (1 kHz steps) DC (optional)	50, 60, 100, 120 Hz 200 Hz to 20 kHz (100 Hz steps) 100 kHz DC (optional)
Read-out	Display or via IEEE-488 or RS-232 interface	
Fast Max. speed	10 measurements/s	
Test frequency	200 Hz to 100 kHz (200 Hz steps) 100 kHz to 1 MHz (1 kHz steps) DC (optional)	200 Hz to 20 kHz (200 Hz steps) 100 kHz DC (optional)
Single Read-out	Triggered via handler interface Triggered via IEEE-488 or RS-232 Via IEEE or RS-232 interface (display blanked)	
Binning Standard bins Special bins Bin programming via Bin limit programming	9 Bin "O" and bin "fail" IEEE-488 interface RS-232 interface Bin programmer (4265 only) Absolute or relative	
Trim function Open circuit Short circuit	Open circuit compensation Z > 100 kΩ Short circuit compensation Z < 10 Ω	
Protection against charged capacitors C < 2 µF 2 µF ≤C ≤2 mF C > 2 mF	$V_{max.}$ < 200 V $V_{max.} < 47 \times (C/mF)^{-0.234}$ ($V_{max.}$ in V, C in mF) $V_{max.}$ < 40 V	$V_{max.}$ < 500 V $V_{max.} < 117 \times (C/mF)^{-0.234}$ ($V_{max.}$ in V, C in mF) $V_{max.}$ < 100 V
Stored settings (non-volatile memory) Front panel settings Bin settings	9+1 (trim figures included) 9+1	
Print measurement results	Via RS-232 interface for serial printers	
Calibration Calibration interval	1 year	
Environmental conditions Operating temperature Storage temperature Power requirements Line frequency	0°C to 50°C –40°C to 70°C 100/120/220/240 V ± 10% 50/60 Hz	
Power consumption	44 VA	31 VA
EMC Safety	According to CE-regulation 89/336: Emmission according to EN 55011, Group 1 Class B, respectively CISPR 11. Immunity according to EN 50082 - 1, inclusive IEC 801-2,-3,-4. According to CE-regulation 73/23 EN61010 CAT II, Pollution Degree 2, CSA C22.2 No. 231	
Warm-up time	30 minutes	5 minutes
Dimensions and weight WxHxD	315 x 105 x 405mm (12.4" x 4.13" x 15.9")	
Weight	5.3 kg /11.7 lb	4.7 kg /10.4 lb

ORDERING CODES/OPTIONS

Description

1J4260
Automatic LCR Meter 1 kHz
Supplied with User Manual and AC Power cable

1J4265
Automatic LCR Meter DC-100 kHz
Supplied with User Manual and AC Power cable

Options (for 1J4265)

/A RS-232 Interface (cannot be fitted with option /B)
/B IEEE-488 Interface (cannot be fitted with option /A)
/C DC Test
/D Handler Interface

1J4270
Automatic LCR Meter DC-1 MHz with RS-232 Interface
Supplied with User Manual and AC Power cable

Options (for 1J4270)

/B IEEE-488 Interface (supplied in place of RS-232 interface)
/C DC Test
/D Handler Interface

Accessories

9536/041
RS-232 Cable 3m, 9 pin female / 9 pin female

9540/BAN
4-wire test cable set with Banana Plugs

9540/TWE
SMD tweezers

9541A
4-wire test cable set with Kelvin clips (Ag coating)

9541B
4-wire test cable set with Kelvin clips (Heavy Au gold 2-4um)

9542A
Universal test adapter

9542SMD
Test fixture for SMD's. (Used in conjunction with the 9542A)

9564
Rack mount kit

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