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Technical data sheet

Wayne Kerr Electronics



Precision Component Analyzers- 6430B & 6440B

- Fast automatic capacitor testing
- High measurement accuracy on dissipation factor
- Fast measurement speed
- 0.02% basic measurement accuracy
- Comprehensive measurement functions, Graphical sweep on all measurement functions
- Characterize components to 3 MHz
- Large LCD display and intuitive user interface
- Unbeatable price

The 6430B and 6440B Precision Component Analyzers provide thorough and accurate testing of any passive component to high resolution.

In particular, for capacitor manufacturers, the instruments provide capabilities for both fast automatic production testing and complete design characterisation.

Users include designers of passive components, manufacturing test, designing and testing materials as well as circuit designers who are evaluating component characteristics.

The resonant frequency can be automatically calculated for any component together with its equivalent series or parallel circuit at that frequency.

Both instruments are designed for high performance testing of components, with a basic accuracy of 0.02%, at a low price. 6430B is the entry level instrument covering to 500 kHz whilst the fully featured 6440B covers to 3 MHz.

To evaluate a component performance at high speed over a specified range of frequencies, multi frequency mode is used.

In this mode the operator decides which parameter is to be measured and at what frequencies. The 6430B and 6440B does the rest, creating an easy to read table on the large LCD display. Each test can have a simple Pass/Fail display.

Measurement parameters

- Impedance (Z)
- Phase Angle (Ø)
- Inductance (L)
- Capacitance (C)
- DC Resistance (Rdc)
- AC Resistance (Rac)
- Quality Factor (Q)
- Dissipation Factor (D)
- Admittance (Y)
- Conductance (G)
- Reactance (X)
- Susceptance (B)

Graphical sweep on all measurement functions up to 3 MHz

To characterize a component graphically the user can select any of the available measurement functions and create a graph of the parameter value against frequency or AC drive level.

The user is also able to toggle between the major and minor term, for example impedance and phase angle. Either linear or logarithmic scales can be selected.

Following the first sweep the user can use the FIT key, which automatically scales the vertical axis to provide the optimum display for the device under test (DUT).

A marker is also displayed which can be positioned at any point on the graph using the navigation keys. The MAX and MIN keys position the marker at the peak or trough of the graph. The marker position is displayed at the bottom of the screen showing the vertical axis value, its minor term and the frequency or drive level.

Printing results and external control

Whether it's a single parameter, table of results from multi frequency mode or a logarithmic graph of component performance, the 6430B and 6440B will output the results directly to a printer.

The GPIB interface is used to control the instrument and read back measured values for quality control or for archiving purposes.

Output lines are also available to control a bin handler interface. Component tolerance levels may be pre-set and stored. A 25-way D connector mounted on the rear panel gives easy access for connection to external component handling equipment.

Fast automatic multi-frequency production testing of capacitors

The 6430B and 6440B deliver fast automatic testing of capacitors in a production environment. The user is able to select measurements from any of the instruments range and perform up to eight different tests on each component.

Tolerance bins can be selected for each of the tests. The instrument selects the overall bin after completing all the tests. The measured results can be output over the GPIB or to a printer.

The test sequence is triggered by external input, GPIB or the front panel. Once the test sequence is complete the bin is selected and the measured data is made available on the GPIB. This process takes place at very high speed allowing a dual frequency test to be completed in approximately 180 ms.

Pass/Fail data in statistical form is available to the user and can be viewed on the LCD display, printed to a local printer or exported over the GPIB.

Excellent performance and unbeatable price

As the market leader with over 50 years experience of developing component analyzers you would expect Wayne Kerr to provide the best performance in the industry. However, what you might not also expect is that Wayne Kerr is able to offer high performance and accuracy at very competitive prices.

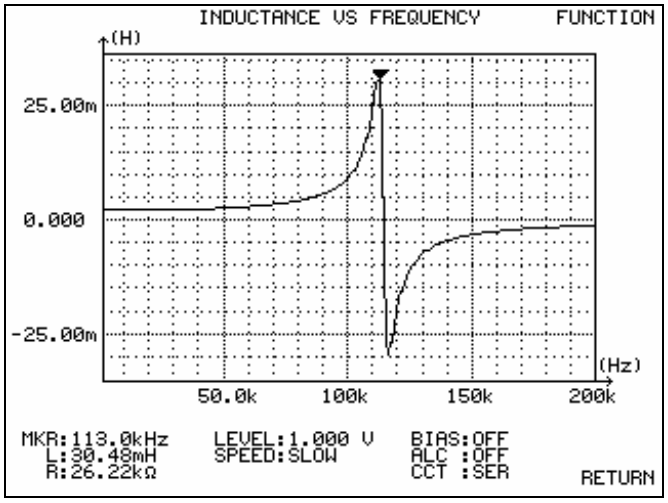
Protection against charged capacitors

High precision measuring instruments can be sensitive to charged capacitors and if connected can lead to costly repairs and unacceptable downtime. Wayne Kerr Electronics have identified this problem and developed a solution that protects the test equipment from charged capacitors.
In this event, the protection unit blows fuses, which can be easily and cheaply replaced, whilst the test equipment remains unharmed and continues to provide reliable accurate performance.

The protection unit will protect the test equipment from up to 25 Joules of charged energy.



Accurate component analysis to 500 kHz (6430B) or 3 MHz (6440B) is simplified by many accessories which includes Overload Protection Unit 1J1100



Inductance plotted against frequency

Technical specifications, precision component analyzers - 6430B & 6440B

Measurement parameters

Any of the following parameters can be measured and displayed:
Inductance (L), impedance (Z), DC resistance (Rdc) and capacitance (C)
Series or Parallel Equivalent Circuit
C+R, C+D, C+Q, L+R, L+Q
Series equivalent circuit only
X+R, X+D, X+Q
Parallel equivalent circuit only
C+G, B+G, B+D, B+Q
Polar Form
Z + Phase Angle, Y + Phase Angle

Test conditions

Frequency range 6430B
20 Hz to 500 kHz >1000 steps
Accuracy of set frequency ±0.005%
>1500 steps with analysis option fitted

Frequency range 6440B
20 Hz to 3 MHz > 1800 steps
Accuracy of set frequency ±0.005%

Pre-set frequencies
20, 25, 30, 40, 50, 60, 80, 100, 120,
150 repeats for each decade

Drive level (Rdc)
100 mV or 1 V with 100 Ω source resistance

Drive level (AC measurements)
Open circuit voltage 1 mV to 10 V rms
Signal source impedance 50 Ω
Automatic Level Control (ALC) maintains constant voltage or current at DUT

DC bias voltage (internal)
2 V with rapid charge capacitor bias

DC bias voltage (external)
External supply of up to ±60 V may be connected via rear panel

Measurement speeds
Four selectable speeds for all measurement functions Up to 20 measurements per second for test frequencies ≥100 Hz

Measurement ranges
R, Z 0.01 mΩ to > 2 GΩ
G, Y 1 nS to > 2 kS
L 0.1 nH to > 2 kH
C 1 fF to > 1 F
D 0.00001 to >1000
Q 0.00001 to >1000
Rdc 0.1 mΩ to > 10 MΩ

Basic accuracy
L/C ±0.05%
R ±0.02%
Q ± 0.05 %(Q + 1/Q)
D ±0.0002(1+ D2)
Rdc ± 0.1%
Accuracy varies with component range measurement speed and frequency

Modes of operation

Measurement
Selection of any measurement parameter and test condition
Single level function menu controlled by keyboard and soft keys
Single and repetitive measurements displaying major and minor terms

Deviation
As measurement mode but relative or percentage deviation from nominal value displayed for major or minor term

Multi-frequency
Measurement parameters and test conditions set using measurement mode
Up to 8 frequencies with absolute or percentage limits on major term Pass/Fail indication

Multi-frequency capacitor (optional)
Test condition set using measurement mode.
Up to 8 frequencies with different measurement parameters.
Binning result in up to 10 bins with percentage limits on major term and absolute on minor. Fast mode up to twice the speed of standard multi-frequency mode.

Analysis mode (optional 6430B)
Measurements parameters and test conditions set using measurement mode
Graphical sweep vs. frequency or level with selection of start, step size, units and linear/log.

Binning (optional)
Measurement parameters and test conditions set using measurement mode.
10 bins with absolute and percentage limits.
Up to 99 sets of limits may be saved.
25 way D-type interface connector.
Option /B1 (non-isolated)
Common 0 V. Bin outputs 0 to 5 V(nominal) with >10 mA current sink capability.
Option /B2 (isolated)
Common 24 V input. Outputs 0 to 24 V with >10 mA current source capability.

Measurement connections
4 front panel BNC sockets
4-wire (Kelvin) measurements with screen at ground potential

General

Power requirements
115 V or 230 V AC ±10% (selectable)
150 VA Max

Mains frequency
50/60 Hz

Mains fuse rating
230 V operation - 1A 'T' type
115 V operation – 2A 'T' type

Wayne Kerr Electronics

Technical data sheet

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

Printer output
Centronics / parallel printer port

Remote control
Conforms with GPIB-IEEE 488.2 and SCPI 1992.0

Mechanical
Height 150 mm (5.9″)
Width 440 mm (17.37″)
Depth 525 mm (20.5″)
Weight 11 kg (24.25 lb)

Environmental conditions

Temperature Range
Storage -40°C to 70°C
Operating 0°C to 40°C
Full Accuracy 15°C to 35°C

Relative humidity
Up to 80% non-condensing

Altitude
Up to 2000m

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 and non-corrosive atmosphere

Safety
Complies with the requirements of EN61010-1

EMC
Complies with EN61326 for emissions and immunity

Order codes

Description	*Order code*
6430B Precision Component Analyzer (20 Hz to 500 kHz)	**1J6430B**
6440B Precision Component Analyzer (20 Hz to 3 MHz)	**1J6440B**

Both models supplied with:-
User manual
2m AC power cable
Kelvin clips 1EVA40100

6440B supplied with:-
2 x transfer standard capacitors

Options for 6430B
/B1 Bin handler (cannot be fitted with /B2)
/B2 Bin handler opto-coupled (cannot be fitted with /B1)
/C Multi-frequency capacitor function
/E Analysis function (standard on 6440B)

Options for 6440B
/B1 Bin handler (cannot be fitted with /B2)
/B2 Bin handler opto-coupled (cannot be fitted with /B1)
/C Multi-frequency capacitor function

Optional accessories for 6430B & 6440B

Description	*Order code*
Overload Protection Unit (25 Joules)	1J1100
Kelvin Lead (large jaw)	1EVA40180
Kelvin Lead (fine jaw)	1EVA40100
4 Terminal Lead Set	1EV1505
BNC-4 Term. Comp. Fixture	1EV1005
BNC-4 Term. Comp. Fixture (>500 kHz)	1EV1006
SMD Probe Lead	1EV1905A
SMD Tweezers	1EVA40120
Operating/Maintenance Manual	9H(model no.)
Certificate of Calibration with results	1JCALRES

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