DB230 Capacitor Tester

Quick and accurate testing on automatic production lines

General

The DB230 Component Tester is especially designed for high accuracy testing of capacitors on production lines, not least for integration with sorting machines in a production environment. The instrument is reliable, user-friendly and easy to set up to any test.

The DB230 utilises an external bridge module allowing the user to install the measuring bridge very close to the measuring Jig. This ensures high measuring accuracy. Especially when measuring at 100kHz and 1MHz, cables are main causes to noise. When installing an LCR bridge on a production line, some distance between the instrument and the Jig is unavoidable. With the DB230, total cable length of up to 4 m (157 inches) is supplied.

The DB230 utilises a well-proven input protection system to protect the bridge module from damages owing to exposure to charged capacitors. This secures that the DB230 does not break down as easily as other LCR bridges, when exposed to charged capacitors.

The DB230 can perform dual frequency tests at any combination of frequencies. A popular configuration is to test capacitance at 1kHz and loss factor at 100kHz or 1MHz. As standard, DB230 can sort capacitors into bins according to the measured parameters at two frequencies simultaneously.

Bin sorting with up to 12 bins for capacitance for 1st frequency and up to 4 bins for tan ∂ using 2nd frequency. Or tan ∂ may be measured at several frequencies using the 4 bins for different levels of the dissipation factor.

As standard the instrument has a built-in comparator for deviation measurements, IEEE488 (GPIB) and RS232C data interfaces as well as handler interface (opto-coupler type). All measured data are collectable from the data interfaces. Via the PCMCIA slot it is possible to easily store set-ups to distribute to other instruments quickly, without operator mistakes.

Measuring frequencies: 1MHz, 100kHz, 10kHz and 1kHz

Overall accuracy better than 0,05% and 2 x 10^{-4} for loss factor

External bridge module for long cables (3 m or 118 inches) between the instrument and the bridge module

Measuring cables: 1 m or 39,3 inch (supplied as standard)

Input protection against charged capacitors at 2 Joule up to 1kV. This feature can be extended by an optional Protection Box, PB10

Built-in contact check function ensures that the contact to the device is good, additional 2-6 ms

High measuring speed: 6 to 20ms from trig to end of measurement

Measuring ranges: 0,1pF to 1mF depending of test frequency

Measures up to 29nF (0,2%) @ 1MHz

Internal bias voltage: Up to ±3VDC on generator terminal, set in 0,1V steps

External bias voltage: Up to ±48VDC

Average: 1 to 99 measurements

Display readings: Direct or deviation capacitance and tan ∂ or ESR for loss measurements and L/Q, Rs, Rp, Z

Optional Jig31 for 4-terminal manual component testing of axial, radial and SMD components

Specifications for DB230

Measured Parameters	C, L, R, Z (serial or parallel) tan ∂, ESR, Rs, Rp, L/Q, R-X, Z-θ (deg or rad)
Measuring Frequencies	1MHz, 100k, 10k and 1kHz with multiple frequency facility

Measuring Voltages

1 V RMS up to 10µF at 1kHz
1 V RMS up to 1µF at 10kHz
1 V RMS up to 100nF at 100kHz
1 V RMS up to 10nF at 1MHz

Above: (linearly decreasing with the impedance). Programmable in 0.1V steps (maximum 1.5V RMS)

Measuring Speed

	1kHz	10kHz	100kHz	1MHz
From trig to end of measurement*	20ms	20ms	6ms	6ms
From trig to data ready*	28ms	28ms	14ms	14ms
Additional time per measurement by average	16ms	16ms	2ms	2ms

*) allowing 3ms contact bouncing or 1 range change
Multiple measurements (average): The sum of each measurement (from trig to end of measurement) + 8ms for calculation time

Measuring Cables	1m (39.3 inch) from bridge module to fixture	(cables supplied by Danbridge)
Input Protection	2 Joule up to 1kV or 4µF charged 1000V	
Bias Voltage internal	Up to ±3.0VDC on generator terminal, set in 0.1V steps	(internally generated)
Bias Voltage external	Up to ±48V DC	

Capacitance

Frequency		Accuracy ±1 digit	Average ≥2
1kHz	10kHz	Capacitance	Tan ∂
1pF- 39pF	0.1pF- 3.9pF	0.2 pF	± .0010
40pF- 3.9µF	4pF- 3.9µF	0.05%*	± .0002
4µF- 399µF	4µF- 39µF	0.1%	± .0007
400µF- 1mF	40µF- 400µF	1%	± .0020
100kHz	1MHz		
.03pF- .9pF	.01pF- 3.9pF	0.1pF	± .0010
1pF- .9µF	4pF- 0.9nF	0.05%**	± .0002
-	1nF- 9.9nF	0.1%	± .0007
1µF- 9µF	10nF- 29nF	0.2%	± .0010
10µF- 40µF	30nF- 99nF	1%	± .0020

*) Accuracy ± 0.2pF **) Accuracy ± 2pF. The above specifications require a stable jig with capacitance lower than 30pF

Inductance

1kHz	10kHz	100kHz	Accuracy	1MHz	Accuracy
10µH-100H	1µH-10H	0.1µH-1H	1 parameter 0.1% 2 parameter ± (0.1%+0.05xQ)	0.02µH- 0.1H	1 parameter 0.1% 2 parameter ± (0.2%+0.05xQ)

Resistance

0.4Ω-40Ω	0.4Ω-40Ω	0.4Ω-40Ω	0.1%	0,4Ω-40Ω	0,1%
40Ω-4MΩ	40Ω-4MΩ	40Ω-1MΩ	0.05%	40Ω-100kΩ	0.05%
				100kΩ-400kΩ	0.5%

The above specifications are valid for measurements with constant voltage

Bin sorting	Up to 12 limits for 1st parameter and 4 limits for 2nd parameter by opto-couplers	
Interfaces	Rear panel	*IEEE 488-2 (GPIB) and RS232C*
	Control	*Measure end, data ready, trig ready, fault and status*
	Trig input	*DC, AC and contact closure*
	Front panel	*PC card for set-ups, save and loading*
Environment	Ambient temperature	*10-30 degrees Celsius*
	Warm-up time	*Minimum 30 minutes*
	Power	*90-130 and 200-260 V AC, 50-60 Hz*
Calibration interval	Minimum	*Every 12 months*

Dimensions

	Mainframe	Bridge module	Export Packing **Europe:**	Export Packing **Overseas:**
Height	140 mm or 5.5 inch	35 mm or 1.4 inch	30 cm or 11.7 inch	32 cm or 12.8 inch
Width	438 mm or 17.2 inch	192 mm or 7.5 inch	51 cm or 20 inch	52 cm or 20.4 inch
Depth	360 mm or 14.2 inch	205 mm or 8.1 inch	56 cm or 22 inch	55 cm or 21.6 inch
Weight	total 16 kg or 36 lb.	1 kg or 2.3 lb.	21 kg or 47.3 lb.	23 kg or 51.8 lb.

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