



- **Measuring frequencies: 100kHz, 10kHz, 1kHz and 100Hz (120Hz)**
- **Overall accuracy better than 0,05% (C & Z)  $2 \times 10^{-4}$  for  $\tan \delta$  and ESR 0.1m $\Omega$**
- **Especially suitable for film, tantalum and electrolytic capacitors and other high capacitance applications**
- **Special facility for capacitance @ 100Hz (120Hz) and Z @ 100kHz almost simultaneously**
- **Measures Z and ESR @ 1kHz, 10kHz or 100kHz up to >3mF**
- **Built-in contact check function**
- **High measuring speed: 20 to 180ms from trig to end of measurement, depending of frequency.**
- **External bridge module for long cables (2m / 78.6inch) between the instrument and the bridge module**
- **Measuring cables: 1m or 39.3 inch (supplied as standard)**
- **Internal bias voltage: Up to  $\pm 3V$  DC on generator terminals, set in 0.1V steps.**
- **External bias voltage: Up to  $\pm 48V$ D**

## General

The DB236 High Capacitance Tester is specially designed for high accuracy and automatic high-speed testing of large capacitance's such as metallized film, tantalum and aluminium capacitors. The instrument is reliable, user-friendly and easy to set up to any test application on production lines, in quality control departments or in laboratories.

The DB236 performs capacitance and loss factor tests at any of the 4 standard frequencies. Dual frequency tests at any combination of frequencies are possible as well. Or the user may set up a test sequence in order to perform multiple frequencies testing, easily and quickly. Combinations of Cap and  $\tan \delta$  and or ESR @ 100Hz (120Hz) and impedance @ 100kHz is easy to set up and fast to measure.

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) with 12+4 bins for production sorting.

The high-speed data interfaces may be used for an

external computer in order to control the system, or for collection of data for statistics and analysis.

Bin sorting with up to 12 bins for capacitance for 1<sup>st</sup> frequency and up to 4 bins for Z, ESR or  $\tan \delta$  using 2<sup>nd</sup> frequency. Or Z, ESR and  $\tan \delta$  may be measured at several frequencies using the 4 bins for different levels of the loss factor.

The standard fitted PCMCIA card is the easy way of storing set-ups and measuring data. Fail-safe loading of set-ups to several instruments will be done fast and efficient.

The external bridge module allowing the user to install the DB236 in applications where long distance between the instrument and the contacts is unavoidable. Total cable length of more than 3m or 118 inches is possible.

The DB236 is designed for industrial production environments and is well protected against charged capacitors. Should the built in protection of 4 $\mu$ F 1kV not be sufficient, an external extra protection box PB11 available as an optional item. Further the instrument is available in versions with 120Hz, order DB236 – 120 and/or in a high-speed version, order DB236 HS

# Specifications for DB236

**Measured Parameters:** C, L, R, Z (serial or parallel)  $\delta$ , ESR, Rs, Rp, L/Q, Z- $\theta$  (deg or rad)  
**Measuring Frequencies:** 100k, 10k, 1k and 100Hz with multiple frequency facility

<b>Measuring Voltages:</b>	1 V RMS up to 100 $\mu$ F at 100Hz
	1 V RMS up to 10 $\mu$ F at 1kHz
	1 V RMS up to 1 $\mu$ F at 10kHz
	1 V RMS up to 0.1 $\mu$ F at 100kHz
Above: (linearly decreasing with the impedance) Programmable in 0.1V steps (maximum 1.5V RMS)	

<b>Measuring Speed:</b>		100Hz	(120Hz)	1kHz	10kHz	100kHz
	From trig to end of measurement *	180ms	150ms	20ms	20ms	20ms
	From trig to data ready: *	190ms	160ms	28ms	28ms	28ms
	Add. time per meas. by average	160ms	135ms	16ms	16ms	16ms

\*) 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 4 $\mu$ F charged 1000V  
**Bias Voltage Internal:** Up to  $\pm$ 3.0VDC on generator terminal, set in 0.1V steps (internally generated)  
**Bias Voltage External:** Up to  $\pm$ 48V DC

Accuracy C & tan $\delta$ :	Frequency	100Hz (120Hz)	1kHz	Accuracy $\pm$ 1 digit	
				Capacitance	Tan $\delta$
		300pF - 3.9nF	10pF - 390pF	0.5%	$\pm$ .0010
		3nF - 30 $\mu$ F	400pF - 3.9 $\mu$ F	0.05%	$\pm$ .0002
		30 $\mu$ F - 300 $\mu$ F	4 $\mu$ F - 399 $\mu$ F	0.1%	$\pm$ .0007
		300 $\mu$ F - 3mF	400 $\mu$ F - 1mF	0.1%	$\pm$ .0010
				1%*	$\pm$ .0020
		>3mF C: (C measured / 0.3mF) * 0.1%		Tan d: (C measured / 0.3mF) * 0.002	
		10kHz	100kHz		
		39pF - 3.9 $\mu$ F	3.9pF - .9 $\mu$ F	0,05%	$\pm$ .0002
		4 $\mu$ F - 39 $\mu$ F	1 $\mu$ F - 9 $\mu$ F	0,1%	$\pm$ .0007
			40 $\mu$ F - 400 $\mu$ F	0,2%	$\pm$ .0010
				1%	$\pm$ .0020
<b>Accuracy ESR:</b>		$\text{ESR} = \frac{\tan d}{2 \pi f C_s}$			
<b>Accuracy Z:</b>		$Z_c = \frac{1}{2 \pi f C}$			

\* Accuracy decreases linear from 0,1% to 1%

**Bin Sorting:** Up to 12 limits for 1<sup>st</sup> parameter and 4 limits for 2<sup>nd</sup> parameter by opto-couplers

**Interfaces:** Rear panel: IEEE 488 (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 temp.: 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

<b>Dimensions:</b>		Mainframe:	Bridge Module:	Export Packing	
				Europe	Overseas
	Height:	140mm or 5.5 inch	35mm or 1.4 inch	30cm	32cm - 12inch
	Width:	438mm or 17.2 inch	192mm or 7.5 inch	51cm	52cm - 20inch
	Depth:	360mm or 14.2 inch	205mm or 8.1 inch	56cm	55cm - 22inch
Weight:	Total 16kg or 36 lb.	1kg or 2.2 lb	21kg	23kg or 51 lb	

