# 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%<br>2 parameter ± (0.1%+0.05xQ) | 0.02µH- 0.1H | 1 parameter 0.1%<br>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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# DB232 Capacitor Tester

*Quick and accurate testing on automatic production lines*




## General

The DB232 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 DB232 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 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 DB232, total cable length of up to 4m (157 inches) is supplied.

The DB232 utilises a well-proven input protection system to protect the bridge module from damages owing to exposure to charged capacitors. This secures that the DB232 does not break down as easily as other LCR bridges, when exposed to charged capacitors.
The DB232 can perform dual frequency tests at any combination of frequencies. A popular configuration is to test capacitance at 1kHz and loss factor at 100kHz. As standard, it 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 possible to easily store set-ups to distribute to other instruments quickly, without operator mistakes.

**Measuring frequencies: 100kHz, 10kHz, 1kHz and 100Hz**

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

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

**Measuring cables: 1m 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, PB11**

**Built-in contact check function ensures that the contact to the device is good, additional 2-6 ms0**

**High measuring speed: 20 to 180ms from trig to end of measurement**

**Measuring ranges: 0,1pF to 3mF depending of frequency**

**Measures up to 9µF (0,2%) @ 100kHz**

**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 version of DB232 with the test frequencies: 100kHz, 10kHz 1kHz and 120Hz**

# Specifications for DB232

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

**Measuring Voltages**

| |
|---|
| 1 V RMS up to 100µF at 100Hz |
| 1 V RMS up to 10µF at 1kHz |
| 1 V RMS up to 1µF at 10kHz |
| 1 V RMS up to 0.1µF at 100kHz |

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

**Measuring Speed**

| | 100Hz | 1kHz | 10kHz | 100kHz |
|---|---|---|---|---|
| From trig to end of measurement* | 180ms | 20ms | 20ms | 20ms |
| From trig to data ready* | 190ms | 28ms | 28ms | 28ms |
| Additional time per measurement by average | 160ms | 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 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 |
|---|---|---|---|
| 100Hz | 1kHz | Capacitance | Tan ∂ |
| 300pF- 3nF | 1pF- 39pF | 0.5%* | ± .0010 |
| - | 40pF- 3.9µF | 0.05%* | ± .0002 |
| 3nF- 30µF | 4µF- 399µF | 0.1% | ± .0007 |
| 30µF- 300µF | - | 0.1% | ± .0010 |
| 300µF- 3mF | 400µF- 1mF | 1% | ± .0020 |
| 10kHz | 100kHz | | |
| 0,1pF- 3.9pF | .03pF- .9pF | 0.1% | ± .0010 |
| 4pF- 3.9µF | 1pF- .9µF | 0.05%** | ± .0002 |
| 4µF- 39µF | - | 0.1% | ± .0007 |
| - | 1µF- 9µF | 0.2% | ± .0010 |
| 40µF- 400µF | 10µF- 40µF | 1% | ± .0020 |

*) Accuracy ± 0.2pF **) Accuracy ± 0,1pF. The above specifications require a stable jig with capacitance lower than 30pF

**Inductance**

| 100Hz | 1kHz | 10kHz | 100kHz | Accuracy |
|---|---|---|---|---|
| 10µH- 100H | 1µH- 10H | 0.1µH- 1H | 0.1µH- 1H | 1 parameter 0.1% · 2 parameter ± (0.1%+0.05xΩ) |

**Resistance**

| | | | | |
|---|---|---|---|---|
| 0,4Ω- 40Ω | 0.4Ω- 40Ω | 0.4Ω- 40Ω | 0.4Ω- 40Ω | 0.1% |
| 40Ω- 4MΩ | 40Ω- 4MΩ | 40Ω- 4MΩ | 40Ω- 1MΩ | 0.05% |

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 |
| Weigh | 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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# DB233 CLR Component tester

*100kHz, 10kHz, 1kHz and 100Hz*




## General

The DB233 Component Tester is specially designed for manual as well as automatic high-speed high accuracy testing of capacitors or other CLR applications. 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 DB233 is well suited for mounting on sorting machines or other automatic test applications where the distance between the front panel of the DB233 and the Jig is less than 50 cm, 19.6 inch. When the distance is longer, the DB232 should be preferred to provide maximum accuracy.

The DB233 performs capacitance and loss factor tests at any of the 4 standard frequencies. Dual, triple and quadro frequency tests are popular to give an immediate presentation of capacitance and loss factor measurements over a range of frequencies.
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) 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 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.

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

The test cables are as standard connected to the front panel of the instrument. Another possibility is to order the DB233 in the version MCR in order to have the test cables connected to the rear panel only. Optional protection box PB10 protecting the instrument against charged capacitors is available.

**4 measuring frequencies: 100kHz, 10kHz, 1kHz and 100Hz**

**Overall accuracy better than 0.05% and 2 x $10^{-4}$ for loss factor**

**Especially suitable for film, foil, tantalum and electrolytic capacitors, as well as all other CLR applications**

**Built-in contact check function, additional 2-6 ms**

**High measuring speed: 20 to 180ms from trig to end of measurement, depending on frequency**

**Input protection: 2 Joule up to 1kV**

**Measuring ranges: 0.1pF to 3mF depending on frequency**

**Measures up to 9µF (0.2%) @ 100kHz**

**Measuring cables: 1m or 39.3 inch (supplied as standard)**

**Internal bias voltage: Up to ±3VDC on generator terminal, set in 0.1V steps**

**Average: 1 to 99 measurements**

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

**Focused strategy on component testing for more than 50 years**

**Optional Jig32 for 4-terminal manual component testing of axial, radial and SMD components**

**Optional version of DB233 with the test frequencies: 100kHz, 10kHz 1kHz and 120Hz**

# Specifications for DB233

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

**Measuring Voltages**

| |
|---|
| 1 V RMS up to 100µF at 100Hz |
| 1 V RMS up to 10µF at 1kHz |
| 1 V RMS up to 1µF at 10kHz |
| 1 V RMS up to 0.1µF at 100kHz |

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

**Measuring Speed**

| | 100Hz | 1kHz | 10kHz | 100kHz |
|---|---|---|---|---|
| From trig to end of measurement* | 180ms | 20ms | 20ms | 20ms |
| From trig to data ready* | 190ms | 28ms | 28ms | 28ms |
| Additional time per measurement by average | 160ms | 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 front panel 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) |

**Capacitance**

| Frequency | | Accuracy ±1 digit | Average ≥2 |
|---|---|---|---|
| 100Hz | 1kHz | Capacitance | Tan ∂ |
| 300pF- 3nF | 1pF- 39pF | 0.5%* | ± .0010 |
| - | 40pF- 3.9µF | 0.05%* | ± .0002 |
| 3nF- 30µF | 4µF- 399µF | 0.1% | ± .0007 |
| 30µF- 300µF | - | 0.1% | ± .0010 |
| 300µF- 3mF | 400µF- 1mF | 1% | ± .0020 |
| 10kHz | 100kHz | | |
| 0,1pF- 3.9pF | .03pF- .9pF | 0.1% | ± .0010 |
| 4pF- 3.9µF | 1pF- .9µF | 0.05%** | ± .0002 |
| 4µF- 39µF | - | 0.1% | ± .0007 |
| - | 1µF- 9µF | 0.2% | ± .0010 |
| 40µF- 400µF | 10µF- 40µF | 1% | ± .0020 |

*) Accuracy ± 0.2pF **) Accuracy ± 0.1pF. The above specifications require a stable jig with capacitance lower than 30pF

**Inductance**

| 100Hz | 1kHz | 10kHz | 100kHz | Accuracy |
|---|---|---|---|---|
| 10µH- 100H | 1µH- 10H | 0.1µH- 1H | 0.1µH- 1H | 1 parameter 0.1% · 2 parameter ± (0.1%+0.05xΩ) |

**Resistance**

| | | | | |
|---|---|---|---|---|
| 0.4Ω- 40Ω | 0.4Ω- 40Ω | 0.4Ω- 40Ω | 0.4Ω- 40Ω | 0.1% |
| 40Ω- 4MΩ | 40Ω- 4MΩ | 40Ω- 4MΩ | 0.4Ω- 1MΩ | 0.05% |

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 | Export Packing **Europe:** | Export Packing **Overseas:** |
|---|---|---|---|
| Height | 140 mm or 5.5 inch | 30 cm or 11.7 inch | 32 cm or 12.3 inch |
| Width | 438 mm or 17.2 inch | 51 cm or 20 inch | 52 cm or 20.4 inch |
| Depth | 360 mm or 14.2 inch | 56 cm or 22 inch | 55 cm or 21.6 inch |
| Weight | total 16 kg or 36 lb. | 20 kg or 45 lb. | 22 kg or 49,5 lb. |

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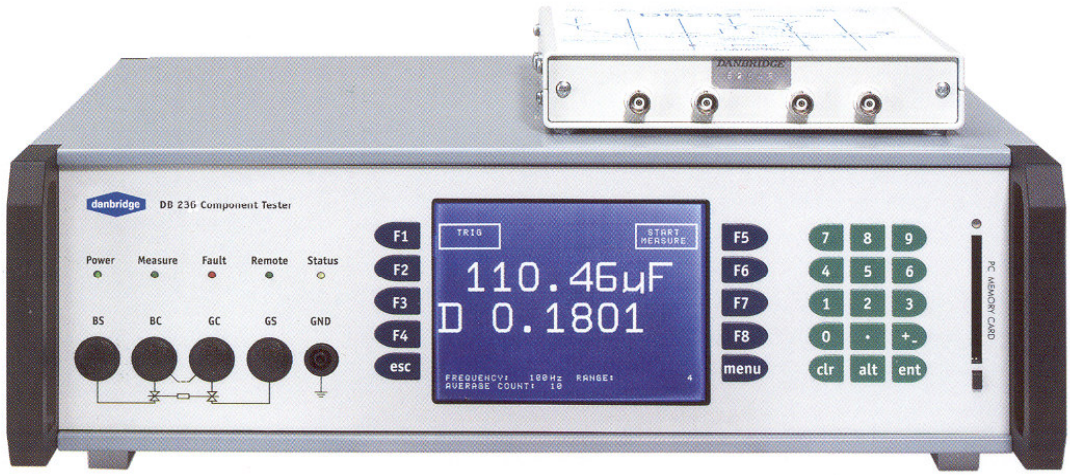
# DB236 Capacitor Tester for large capacitances

*Quick and accurate testing on automatic production lines*




- **Measuring frequencies: 100kHz, 10kHz, 1kHz and 100Hz (120Hz)**
- **Overall accuracy better than 0,05% (C & Z) 2 x $10^{-4}$ for tan δ and ESR 0.1mΩ**
- **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 ±3V DC on generator terminals, set in 0.1V steps.**
- **External bias voltage: Up to ±48VD**

## 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 δ 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 1st frequency and up to 4 bins for Z, ESR or tan δ using 2nd frequency. Or Z, ESR and tan δ 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 4µF 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) δ, ESR, Rs, Rp, L/Q, Z-θ (deg or rad)
**Measuring Frequencies:** 100k, 10k, 1k and 100Hz with multiple frequency facility

**Measuring Voltages:**

| |
|---|
| 1 V RMS up to 100µF at 100Hz |
| 1 V RMS up to 10µF at 1kHz |
| 1 V RMS up to 1µF at 10kHz |
| 1 V RMS up to 0.1µF at 100kHz |

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

**Measuring Speed:**

| | 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 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

**Accuracy C & tan δ:**

| Frequency | 100Hz (120Hz) | 1kHz | Accuracy ±1 digit Capacitance | Tan δ |
|---|---|---|---|---|
| | 300pF - 3.9nF | 10pF - 390pF | 0.5% | ± .0010 |
| | | 400pF - 3.9µF | 0.05% | ± .0002 |
| | 3nF - 30µF | 4µF - 399µF | 0.1% | ± .0007 |
| | 30µF - 300µF | | 0.1% | ± .0010 |
| | 300µF - 3mF | 400µF - 1mF | 1%* | ± .0020 |
| | >3mF C: (C measured / 0.3mF) * 0.1% | | Tan d: (C measured / 0.3mF) * 0.002 | |
| | 10kHz | 100kHz | | |
| | 39pF - 3.9µF | 3.9pF - .9µF | 0,05% | ± .0002 |
| | 4µF - 39µF | | 0,1% | ± .0007 |
| | | 1µF - 9µF | 0,2% | ± .0010 |
| | 40µF - 400µF | 10µF - 40µF | 1% | ± .0020 |

**Accuracy ESR:**

$$ESR = \frac{\tan d}{2 \pi f Cs}$$

**Accuracy Z:**

$$Zc = \frac{1}{2 \pi f C}$$

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

**Bin Sorting:** Up to 12 limits for 1st parameter and 4 limits for 2nd 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

**Dimensions:**

| | Mainframe: | Bridge Module: | Export Packing Europe | Export Packing 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 |

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