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High Voltage

Insulation Testing

Digital Multimeter

SPECIALIST



LIFETIME
WARRANTY

CAT III
1000V

4000
DISPLAY
COUNT



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High Voltage Insulation Testing

Digital Multimeter User Manual

Thank you for purchasing this High Voltage Insulation Testing Digital Multimeter. Commonly known as a 'megger', this multimeter is suitable for up to 4 gigaohms high voltage insulation testing at 1000V. The large digital display and test hold & lock functions allow you to easily capture and log measurements, and includes an analogue-style bar graph for easy referencing. Press the backlight button to see measurements in low light conditions. The meter will auto power off after 10 minutes of inactivity to conserve battery power. The meter is also packed into a heavy duty plastic carry case for protection.

Please familiarise yourself with the functions of the multimeter before use. We recommend retaining this manual for ease of reference.

- Improper use of this meter can cause damage, shock, injury or death.
- Always remove the test leads before replacing the battery or fuses.
- Before using the meter, please inspect the condition of the test leads and the meter itself for any damage. If damage is present, please discontinue use.
- Do not measure voltage if the voltage on the terminals exceeds 1000V above earth ground.
- Use great care if voltages are greater than 30VAC RMS. Anything above this is considered a shock hazard.
- Always discharge capacitors and disconnect power before performing diode, resistance or continuity tests.
- Do not exceed the maximum limits of the input values shown in the specification tables on pages 9-11 of this manual.
- Remove the batteries from the meter if it will be unused for an extended period of time.
- Always turn the function switch to the off position when not in use.

FUNCTIONS	
Max. Display	4000 Count
Basic Accuracy	0.8%
DC Voltage Range	125V - 1000V
AC Voltage Range	750V - 1000V
Insulation Resistance	4M Ω - 4G Ω
Resistance	400 Ω
Continuity	Yes
LCD Backlight	Yes
Max/Min	Yes
Data Hold	Yes
Auto Power Off	Yes

V Ω and COM Input Jacks



The battery compartment is at the rear of the multimeter.

FUNCTIONS

Hold & Min/Max Button	<ul style="list-style-type: none">• Press the HOLD button once to hold the measurements on the screen for referencing at a later time.• Press the HOLD button again to return to normal measurements.• To use the Max/Min feature, press the MAX/MIN button for a few seconds until 'MAX' appears on the LCD screen.• Press the button again quickly to move to the 'MIN' measurement.• Press the button for a few seconds to exit Max/Min mode.
Lock & Test Buttons	<ul style="list-style-type: none">• Press the LOCK button to deactivate normal multimeter functions and simply test insulation.• To use the multimeter normally, ensure the LOCK button is deactivated.• While in the LOCK function, press the TEST button to test the highest voltage of the insulation resistance by generating a DC test between the COM and $V\Omega$ jacks.• Press the TEST button again to exit high-voltage insulation resistance testing.
LCD Display	Readings and measurements taken by the multimeter appear in this area.
Zero & Backlight Button	<ul style="list-style-type: none">• Press the ZERO button to set the current value in the primary display to zero (mainly for low resistance 400Ω testing).• Press the ZERO button again to return to the previous display.• Press the ZERO button for two seconds to turn the LCD backlight on.• To turn the backlight off, press the ZERO button again for two seconds.• The backlight will automatically turn off after 15 seconds.
Low Battery	The battery icon will appear on the screen when battery power is low and requires replacement.

Display Indicators	<ul style="list-style-type: none"> • Primary Display: indicates the current function test results. • Secondary Display: indicates the output DCV & ACV when insulation resistance and battery voltages are being tested. • Analogue-Style Bar Graph: graphically indicates the current function test results.
Function Switch	Select a measurement range by turning the switch to the preferred option.
Auto Power Off	<ul style="list-style-type: none"> • The multimeter will automatically enter 'sleep' mode if there's no activity for 10 minutes. • The multimeter will turn on again once a button is pushed or the function switch is moved.
Input Jacks	<ul style="list-style-type: none"> • $V\Omega$ • COM

INSULATION RESISTANCE MEASUREMENT

- 1) Turn the function switch to select one of the four voltage block options: 125V, 250V, 500V or 1000V. The multimeter will automatically select an appropriate testing range.
- 2) Connect the test leads to the device to be tested.
- 3) If the multimeter is already locked into insulation testing mode, then press the TEST button to test the resistance. If the multimeter is in normal mode, then press the LOCK button first to enter the insulation testing function, followed by the TEST button to test the resistance.
- 4) If the detected AC/DC voltage is $<30V$, the highest voltage reading will appear on the primary display, the resistance will be indicated by the analogue bar graph, and the tested insulation voltage will appear on the secondary display.
- 5) If the detected AC/DC voltage is $\geq 30V$, testing will not occur, the primary display will show $>30V$, and the buzzer will sound continuously.
- 6) If a highest voltage reading is not required, perform the above steps without pressing the TEST button. If the detected AC/DC voltage is $<30V$, the resistance will appear on the primary display, and the tested insulation voltage will appear on the secondary display.
- 7) To exit insulation resistance testing, either deactivate the LOCK button or turn the function switch to the OFF position.

LOW RESISTANCE (CONTINUITY) MEASUREMENT

- 1) Turn the function switch to the 400Ω position.
- 2) Connect the black test lead to the negative COM input jack.
- 3) Connect the red test lead to the positive $V\Omega$ input jack.
- 4) Connect the tips of both test leads to both ends of the circuit under test. The multimeter will automatically select from the two ranges ($40\Omega/400\Omega$).
- 5) The resistance measurement will appear on the primary display and synchronise with the analogue bar graph.
- 6) If impedance on the circuit is $\leq 35\Omega$, the buzzer will sound continuously.
- 7) While the tested resistance is 1Ω , the current resistance is 200-200mA.
- 8) If the detected AC/DC voltage is $\geq 30V$, testing will not occur, the primary display will show $>30V$, and the buzzer will sound continuously.

MOTOR TESTING - AC

- 1) Disconnect the motor from the line by either disconnecting the wires at the motor terminal or by opening the main switch.
- 2) If opening the main switch - and the motor also has a starter - then the starter must be held in the ON position.
- 3) If opening the main switch, the measured resistance will include the resistance of the motor, the wire and all other components between the motor and the main switch. If a weakness is detected, all components should be checked individually.
- 4) If disconnecting the wires at the motor terminal, connect one megohmmeter lead to the grounded motor housing, and the other lead to one of the motor leads.

MOTOR TESTING - DC

- 1) Disconnect the motor from the line.
- 2) To test the brush rigging, field coils and armature - connect one megohmmeter lead to the grounded motor housing, and the other lead to the brush on the commutator.
- 3) If the resistance measurement indicates a weakness, raise the brushes off the commutator and separately test the armature, field coils and brush rigging. Connect one megohmmeter lead to each one individually, leaving the others connected to the grounded motor housing.
- 4) This also applies to DC Generators.

CABLE TESTING

- 1) Disconnect the cable from the line, and also disconnect the opposite end to avoid errors due to leakage from other equipment.
- 2) Check each conductor to the ground/lead sheath by connecting one megohmmeter lead to a ground/lead sheather, and the other megohmmeter lead to each of the conductors in turn.
- 3) Check the insulation resistance between the conductors by connecting the megohmmeter leads to the conductors in pairs.

POWER & SMALL APPLIANCE TESTING

Applicable for most power driven equipment that have a mains power cable.

- 1) The equipment should be switched on, with the cable disconnected from mains power.
- 2) Connect the megohmmeter lead to a metal part of the equipment (such as metal housing or working parts).

AC & DC VOLTAGE MEASUREMENT

- 1) Turn the function switch to the ACV (750V) or DCV (1000V) position.
- 2) Connect the the black test lead to the negative COM input jack.
- 3) Connect the red test lead to the positive $V\Omega$ input jack.
- 4) Connect the test leads in parallel to the circuit being measured.
- 5) Read the voltage value displayed on the screen.

MEASUREMENT SPECIFICATIONS

The following guide is based on an environmental temperature of 18-28°C and humidity <75%.

DC VOLTAGE

RANGE	RESOLUTION	ACCURACY
1000V	1V	±(0.8% reading + 3 digits)

Input Impedance: 10M Ω

Overload Protection: 1000VDC RMS

AC VOLTAGE

RANGE	RESOLUTION	ACCURACY
750V	1V	±(1.2% reading + 10 digits)

Input Impedance: 10M Ω

Overload Protection: 1000VAC RMS

Frequency Range: 40~400Hz

OHMS

RANGE	RESOLUTION	ACCURACY
40 Ω	0.01 Ω	±(1.2% reading + 3 digits)
400 Ω	0.1 Ω	

Max Open Circuit Voltage: 5.8V

Overload Protection: 250V RMS

MEG OHMS

RANGE	RESOLUTION	ACCURACY	TEST CURRENT
Terminal Voltage: 125V (0%±10%)			
0.125~4MΩ	0.001MΩ	±(2.0% reading + 10 digits)	1mA @ load 125kΩ
4.001~40MΩ	0.01MΩ		
40.01~400MΩ	0.1MΩ	±(4.0% reading + 5 digits)	
400.1~4000MΩ	1MΩ	±(5.0% reading + 5 digits)	
Terminal Voltage: 250V (0%±10%)			
0.250~4MΩ	0.001MΩ	±(2.0% reading + 10 digits)	1mA @ load 250kΩ
4.001~40MΩ	0.01MΩ		
40.01~400MΩ	0.1MΩ	±(3.0% reading + 5 digits)	
400.1~4000MΩ	1MΩ	±(4.0% reading + 5 digits)	
Terminal Voltage: 500V (0%±10%)			
0.500~4MΩ	0.001MΩ	±(2.0% reading + 10 digits)	1mA @ load 500kΩ
4.001~40MΩ	0.01MΩ		
40.01~400MΩ	0.1MΩ	±(2.0% reading + 5 digits)	
400.1~4000MΩ	1MΩ	±(2.0% reading + 5 digits)	

Terminal Voltage: 1000V (0%±10%)			
1~4MΩ	0.001MΩ	±(3.0% reading + 10 digits)	1mA @ load 1MΩ
4.001~40MΩ	0.01MΩ	±(2.0% reading + 10 digits)	
40.01~400MΩ	0.1MΩ	±(2.0% reading + 5 digits)	
400.1~4000MΩ	1MΩ	±(4.0% reading + 5 digits)	

Short Circuit Current: ≤1mA

CONTINUITY BUZZER

RESOLUTION	OPERATION RESISTANCE
0.01Ω	Resistance ≤35Ω

Short Circuit Current: ≥200mA

Max Open Circuit Voltage: 5.8V

Overload Protection: 250V RMS

MAINTENANCE

BATTERY INSTALLATION

To avoid false readings, replace the battery as soon as the low battery power indicator appears.

- 1) Turn power off and disconnect the test leads from the meter.
- 2) Open the rear battery cover with a screwdriver.
- 3) Remove the old battery and insert the new battery into the battery holder, observing the correct polarity.
- 4) Put the battery cover back in place and secure with the screws.

CHECKING LEADS

To ensure all leads are working properly, you should conduct spot checks.

- 1) Set the function switch to the 400Ω range.
- 2) When the leads are connected, the display on the screen should indicate 00.0 Ω .
- 3) When the leads are disconnected, the display on the screen should indicate OL.
- 4) If different readings display on the screen, there could be an error with the test leads.

SPECIFICATIONS

Measurement Ranges:	4000M Ω /125V, 4000M Ω /250V, 4000M Ω /500V, 4000M Ω /1000V, 400 Ω /BZ, 1000V/DCV, 750V/ACV
Sampling Rate:	2.5 times per second
Operating Temperature:	0°C~40°C
Operating Humidity:	< 80%RH
Storage Temperature:	-10°C~60°C
Storage Humidity:	< 70%RH
Power Supply:	1 x AA Batteries
Dimensions:	200(H) x 92(W) x 50(D)mm
Weight:	700g (including battery)

BOX CONTENTS

- 1 x Multimeter
- 1 x Test Leads
- 6 x AA Batteries
- 1 x Carry Case
- 1 x User Manual

WARRANTY

This product is protected by a lifetime warranty (from the date of purchase) covering all product manufacturing defects/faults that may occur within this timeframe. This warranty does not cover damage caused by neglect, misuse, contamination, alteration, accident or abnormal conditions of operation or handling, including failures caused by use outside of the product's specifications, or the normal wear and tear of mechanical components.

In the event that you suspect your product is defective/faulty, cease using the product when the suspected defect/fault arises and return the product along with proof of purchase to the place of purchase or distributor for assessment. Distributor contact details are available on the last page of this manual.

If the assessment concludes that the product is indeed defective/faulty, the product will either be repaired or replaced at no cost to you.

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

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