

Digital multimeter with AC/DC clamp sensor
Instruction manual

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TEST EQUIPMENT RISK ASSESSMENT

Users of this equipment and/or their employers are reminded that Health and Safety Legislation requires them to carry out a valid risk assessments of all electrical work, so as to identify potential sources of electrical danger and risk of electrical injury such as from inadvertent short circuits.

2 Features and layout

- AC and DC current measurement up to 100A using integral fork-type sensor
- Auto-ranging on voltage, current and resistance ranges
- Frequency measurement function
- Auto-power-save function
- Integral buzzer for continuity checking
- Data-hold and range-hold functions
- LCD with 3400 count and bar-graph
- Protective shock-absorbing holster with probe storage
- Designed to international safety standard IEC61010, over-voltage category CAT.III, 300V, CAT.II, 600V, pollution degree 2.

Note:

Measurement Category (Overvoltage Category) III is for measurements performed in the building installation. Examples are measurements on distribution boards, circuit breakers, wiring including cables, bus-bars, junction boxes, socket outlets and permanently connected equipment in the fixed installation.

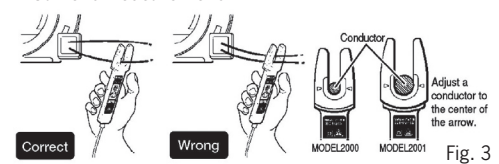
Measurement Category II (Overvoltage category II) is for measurements performed on circuits directly connected to the fixed installation. Examples are measurements on household appliances, portable tools and similar equipment.

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- Environmental conditions: Indoor use only, Altitude up to 2000m
- Temperature and humidity ranges to meet specification: 23 °C ±5 °C, relative humidity 75% or less (no condensation)
- Operating temperature and humidity range: 0-40 °C, relative humidity 85% or less (without condensation)
- Storage temperature and humidity range: -20-60 °C, relative humidity 85% or less (without condensation)
- Power source: Two 1.5VDC AAA, R03, or UM-4 Alkaline batteries
- Current consumption: Approx. 10mA
- Power-save function: Instrument enters power-save state about 10 minutes after the last switch operation (Current consumption: approx. 10 μA in power-save mode)
- Overload protection: AC/DC current ranges: AC/DC 120 A for 10 seconds
AC/DC voltage ranges: AC/DC 720V for 10 seconds
Resistance ranges: AC/DC 720V for 10 seconds
Frequency ranges: AC/DC 720V for 10 seconds
- Withstand voltage: 3700V AC for 1 minute between electrical circuit and housing case
- Insulation resistance: 10MΩ or greater at 1000V between electrical circuit and housing case
- Conductor Size: 10mm diameter max.
- Dimensions: 128(L)×92(W)×27(D) mm approx.
- Weight: 220g approx.

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7 Current measurement



- #### 7.1 DC Current Measurement
- (1) Set the function selector switch to the "DC A" position. ("DC A", "AUTO" and "A" symbols appear at the top of the display.)
 - (2) Before attempting to make a measurement, turn the "DCA ZERO ADJ" knob on the side of the current fork of the multimeter until the display reads zero. Note: If the zero adjustment is made incorrectly, measurement errors will result.
 - (3) Place the current fork around ONE of the conductors of the circuit to be measured, so the conductor is in the centre between the arrows (See Fig.2). The measured value is shown on the display. If the conductor is not at the centre of the arrows, measurement errors will occur.

Note: With the current direction flowing from the top of the fork (Adjuster side) to the bottom of the fork, the polarity of the reading is positive (+). Current flowing in the opposite direction will indicate a negative reading (-).

7.2 AC Current Measurement

- (1) Set the function selector switch to "AC A". ("AC A", "AUTO" and "A" symbols appear at the top of the display.)
- (2) Place the current fork around ONE of the conductors of

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The ISO ISO-TECH IDM-610 Digital Multimeter has been designed to comply with international safety standards. By using the latest technology, this instrument will give accurate and reliable results when used in accordance with these operating instructions.

1 Safety Warnings

Warning! Electricity can cause severe injuries even with low voltages or currents. It is extremely important these instructions are fully read and understood before using this instrument.

The following symbols or terms may appear on the instrument or in these instructions:

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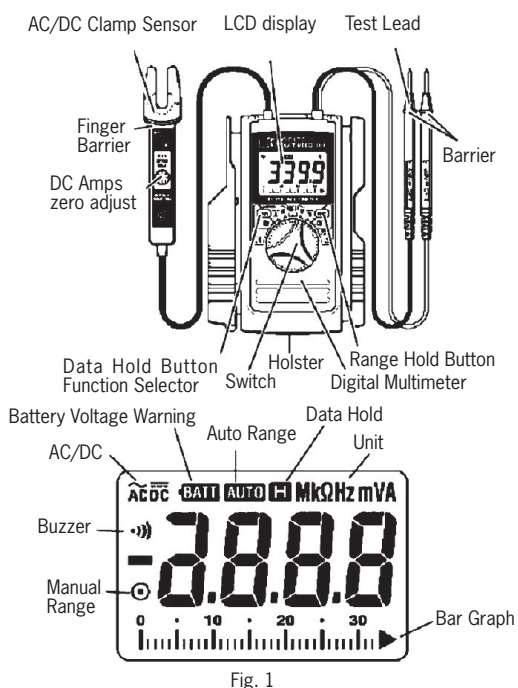


Fig. 1

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- Accessories Qty. two R03 (UM-4) batteries Instruction Manual
- Weight: 220g approx.
- Accessories Qty. two R03 (UM-4) batteries Instruction Manual

4 Pre-use checks and operating notes

- 4.1 Check the battery voltage: Set the function selector switch to any position other than the OFF position. If the batteries have sufficient power, the display is clearly visible and the "BATT" symbol does not appear. If the display is blank or "BATT" appears, replace the batteries according to section 9: Battery replacement.
- 4.2 Examine the instrument and test leads for any sign of abnormality, damage or contamination. If any abnormal conditions exist (i.e. broken test leads, cracked insulation or case, moisture contamination, display faults or inconsistent readings etc.) do not use the instrument. Do not attempt to repair a fault or modify the instrument, but return it for repair. Contact RS Components for further advice; the address is given at the end of these instructions.
- 4.3 Power-save function: When the instrument is turned on and not used for approximately 10 minutes, the automatic power-save function turns the instrument off to conserve battery power. The display will go blank even if the function selector switch is set to a position other than the "OFF" position. To turn the instrument on, turn the function selector switch or press the data-hold button.
- Note:** A small amount of power is consumed in the power-save state. Ensure the instrument is turned off after use.
- 4.4 Data-hold function: This is a function to hold a measured value on the display. Press the data-hold button once

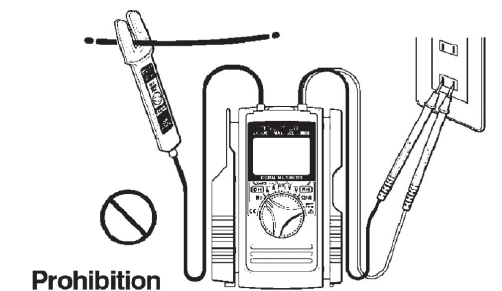
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the circuit to be measured, so the conductor is in the centre between the arrows (See Fig.2). If the conductor is not at the centre of the arrows, measurement errors will occur. The measured value is shown on the display.

Note: Unlike DC current measurement, zero adjustment is not required. No polarity indication is displayed for AC current measurement.

8 Frequency Measurement

Warning! When measuring frequency, do not attach the current fork and the test leads to the circuit under test at the same time.



The frequency of either a current or voltage may be measured, using either the current fork sensor or the voltage test leads respectively.

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⚠	Caution, risk of electric shock
⚠	Caution, risk of danger. Refer to operating instructions.
⎓	Direct current
⊞	Equipment protected throughout by double insulation or reinforced insulation
⊥	Earth
~	Alternating current
~	Alternating and direct current
CE	Complies with applicable EU directives

- 1.1 This instrument must only be used by competent and trained persons and in strict accordance with these instructions. If this instrument is used in a manner not specified in these instructions, the protection afforded by the instrument may be impaired.
- 1.2 This instrument must not be used to make measurements on circuits where the voltage difference is greater than 600VAC or DC between conductors, or 300VAC or DC between a conductor and ground.
- 1.3 Never open the instrument case except for battery replacement. Disconnect all test leads from the circuit before opening the case.
- 1.4 Do not exceed the maximum allowable inputs as given in the specifications.
- 1.5 Do not turn the function selector switch whilst the test leads are connected to a circuit. Select the correct function before making measurements.
- 1.6 Examine the instrument and test leads before use for any sign of abnormality, damage or contamination. If

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3 Specifications

Measuring ranges and accuracy (at 23°C±5%, relative humidity 75% or less)

Current	Range	Measuring Range	Accuracy
AC Current A	100A	0-100.0A	± 2.0%reading ± 5digits(50/60Hz)
DC Current A	100A	0-±100.0A	± 2.0% reading ± 5digits

AC Voltage V Input impedance: 10MΩ

Range	Measuring Range	Accuracy
3.4V	0-600V (Auto-ranging)	± 1.5%reading ± 5digits(50-400Hz)
34V		
340V		
3400V		
600V		

DC Voltage V Input impedance: 10MΩ

Range	Measuring Range	Accuracy
340mV	0-± 600V (Auto-ranging)	± 1.5%reading ± 4digits
3.4V		
34V		
340V		
600V		

Resistance Ω/x·10

Range	Measuring Range	Accuracy
340 Ω	0-33.99M Ω (Auto-ranging)	± 1.0%reading ± 3digits Buzzer beeps below 30 ± 10 Ω (Continuity buzzer works on 340 Ω range only)
3.4k Ω		
34k Ω		
340k Ω		
3.4M Ω		
34M Ω	± 5%reading ± 5digits	
		± 15%reading ± 5digits

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to hold the present reading. In the data-hold state, the reading is held even if the input varies. The "H" and "O" symbols appear on the display instead of "AUTO" mark. To exit the data hold state, press the data-hold button again.

- 4.5 Range-hold function: When first turned on the instrument defaults to auto-ranging mode and the "AUTO" symbol appears on the display. Pressing the range-hold button enables manual selection of the measurement ranges and the "O" symbol appears on the display instead of the "AUTO" symbol. Press the range-hold button to select a higher range. To switch from manual range selection to auto-ranging, press the range-hold button for approximately one second, or turn the function selector switch to another position before setting it back to the required range.
- 4.6 For convenience of measurement in difficult locations, either test lead probe may be clipped into the holder as shown in Fig.2.
- 4.7 The current fork sensor is a sensitive and delicate device. Handle it with care and do not subject it to excessive mechanical shocks or vibrations.



Fig. 2

5 Voltage measurement

5.1 DC voltage measurement

- (1) Set the function selector switch to the "DC V" position. (The "DC V", "AUTO" and "mV" symbols appear at the top of the display.)
- (2) Connect the red test lead to the positive (+) side of the circuit under test and the black test lead to the negative (-)

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8.1 Measuring the frequency of a current:

- (1) Set the function selector switch to "Hz". ("AUTO", "k" and "Hz" appear at the top of the display.)
- (2) Place the current fork around ONE of the conductors of the circuit to be measured, so the conductor is in the centre between the arrows (See Fig.2). The measured value is shown on the display. If the conductor is not at the centre of the arrows, measurement errors will occur.

8.2 Measuring frequency of voltage:

- (1) Connect the test leads to the circuit under test. The measured frequency is shown on the display.
- Note:** The measuring range of current frequency is 0-10kHz with a minimum measurable input of 10A. The measuring range of voltage frequency is 0-300kHz with minimum a measurable input of 10V.

9 Battery replacement.

Warning! Disconnect from the circuit under test and turn the instrument off before opening the case.

- To replace the batteries:
- (1) Use a screwdriver to remove the screw from the battery compartment cover on the rear of the instrument. Remove the cover. Retain the screw and cover.
 - (2) Remove the 2 exhausted cells and replace with 2 fresh cells of the type given in section 4: "Specifications", observing correct cell polarity. Do not mix old and new cells.
 - (3) Refit the battery compartment cover and secure with the screw. Turn the instrument on and check for correct operation.
 - (4) Dispose of the removed cells in accordance with local regulations.

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any abnormal conditions exist (i.e. broken test leads, cracked insulation or case, moisture contamination, display faults or inconsistent readings etc.) do not use the instrument. Do not attempt to repair a fault or modify the instrument, but return it for repair. Contact RS Components for further advice; the address is given at the end of these instructions.

- 1.7 Do not attempt to make any measurements with the current sensor and the test probes at the same time. Stow the current sensor in the holder before making voltage or resistance/continuity measurements. Stow the voltage test probes before making a current measurement.
- 1.8 Voltages above 50 Volts are considered hazardous as they pose a shock hazard. Wear suitable Personal Protective Equipment if working in the presence of un-insulated conductors carrying voltages greater than 50 Volts.
- 1.9 Avoid working alone, so assistance may be summoned if required.
- 1.10 Keep fingers behind the finger guards on the test probes and current fork at all times when making measurements.
- 1.11 If during testing there is a momentary degradation of readings or abnormal results, this may be due to excessive transients or discharges on adjacent circuits in the local area. If this is suspected, repeat the test to verify the reading. If in doubt, contact RS Components for further advice.

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Frequency Hz

Range	Measuring Range	Accuracy
Current	0-3.399kHz 3.4kHz-10kHz (Auto-ranging)	± 0.1%reading ± 1digits
Voltage	0-3.399kHz 3.4kHz-33.99kHz 34kHz-300kHz (Auto-ranging)	± 0.1%reading ± 1digits

- Electromagnetic compatibility: For an RF field ≤1 V/m (IEC 61000-4-3) ACV/DCV/OHMS/FREQUENCY total accuracy = specified accuracy, ACA/DCA total accuracy = specified accuracy +5digits
RF transmitters such as mobile telephones may not be used in close proximity
- Safety Standards: IEC 61010-1 over-voltage category CAT.III, 300V, pollution degree 2 over-voltage category CAT.II, 600V, pollution degree 2
IEC 61010-2-031, IEC 61010-2-032, IEC 61326 (EMC)
- Operating System: Dual integration
Liquid crystal display with maximum reading of 3399, 33 point bar-graph and annunciators.
- Display: "OL" on the LCD (Ω ranges only)
Selects the next higher range when the bar graph increases to 33 points
Selects the next lower range when the bar graph decreases to 3 points
- Over Input Indication: "OL" on the LCD (Ω ranges only)
- Auto-ranging Operation: Selects the next higher range when the bar graph increases to 33 points
Selects the next lower range when the bar graph decreases to 3 points
- Display update time: Numeric reading: about 400ms, bar-graph: about 20ms

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side. The measured voltage value is shown on the display. When the connections are reversed, "-" appears on the display in front of the value to indicate the positive lead is at a lower potential than the negative lead.

5.2 AC voltage measurement

- (1) Set the function selector switch to "AC V". ("AC V", "AUTO" and "V" symbols appear at the top of the display.)
- (2) Connect the test leads to the circuit under test. The measured voltage value is shown on the display.

6 Resistance measurement

Warning! Do not attempt to make resistance measurements on live circuits.

- (1) Set the function selector switch to "Ω/x·10". ("AUTO" and "MΩ" symbols appear at the top of the display.)
- (2) Check the display shows over-range ("O.L." appears on the display.)
- (3) Short the test leads and check that the buzzer sounds and the display reads zero.
- (4) Connect the test leads to the circuit under test. The measured resistance value is shown on the display. When the measured value is below approximately 30 Ω, the buzzer will sound.

Note: When the test leads are shorted, the display may read a small resistance value. This is the resistance of the test leads. If there is an open circuit in either of the test leads, "OL" is shown on the display. On the 340Ω range, "OL" will appear on the left side of the display to indicate the continuity buzzer function is active.

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10 Cleaning, repair and calibration

- 10.1 To clean the instrument, use a damp cloth moistened with water and mild detergent. Do not use abrasives, strong cleaning agents or solvents such as Petrol, Turpentine or Alcohol, as these may damage the plastic surfaces. Ensure the instrument is completely dry before use.
- 10.2 If this instrument requires repair, return it to your nearest RS Components distributor. Please return the instrument with all accessories and provide full details of the fault. For further information, contact RS Components; the address is given at the end of these instructions.
- 10.3 To ensure accurate and reliable operation of this instrument, calibration should be carried out every 12 months, or more frequently if subject to heavy use or the instrument is suspected of being inaccurate. For further information regarding calibration, contact RS Component; the address is given at the end of these instructions.

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