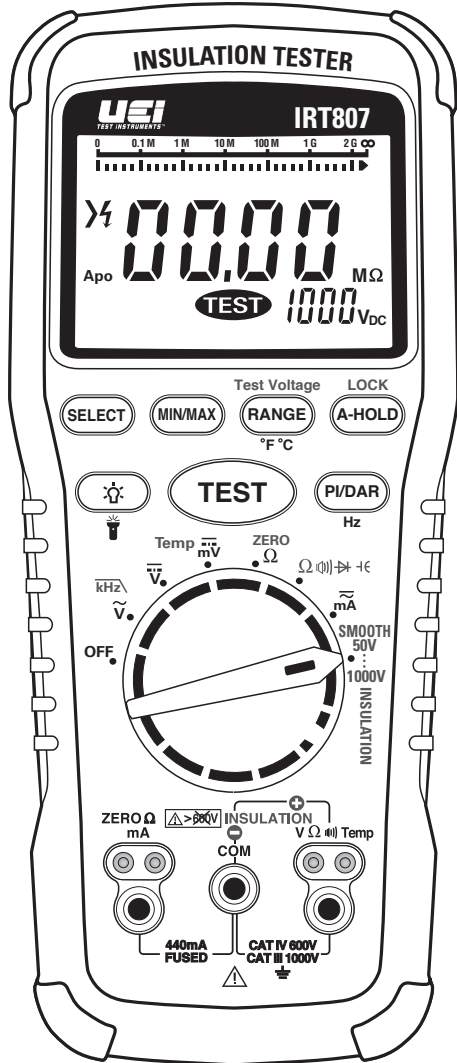


1000V AC/DC Digital Insulation Resistance Tester

INSTRUCTION MANUAL
ENGLISH



Intertek

600V

CAT IV

1000V

CAT III

RoHS
Compliant



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FEATURES

- Insulation Resistance 2.0GΩ
- Earth-bond Resistance 20.00kΩ
- 1000V AC/DC
- Resistance 40MΩ
- Capacitance 10,000μF
- Frequency 99.99kHz
- Continuity and Diode test
- mAmps
- Temperature: -328° to 2462°F (-200° to 1350°C)
- PI/DAR test
- A-Hold/ Hold
- Zero reading
- Lock reading
- Rotary style selector
- Protective rubber boot
- Kick stand
- Test lead holders
- Remote probe
- Auto power off
- Backlit Display
- Worklight

GENERAL SPECIFICATIONS

- Operating Temperature: 32° to 122°F (0° to 50°C)
- Storage Temperature: 14° to 122°F (-10° to 50°C)
- Operating Humidity: <75%
- Operating Altitude: 6,526 ft (2000m)
- Pollution Degree: 2
- Over range: "OFL" is displayed
- Backlight: Yes
- Refresh Rate: 3/sec
- Dimensions: 8.27" x 3.52" x 2.17"
- Item Weight: 1.283 lbs
- Calibration: Recommended annually
- CAT Rating: CATIV 600V/ CATIII 1000V
- Certifications: CATIV 600V/CATIII 1000V, cETLus 3rd Edition, CE Conformity, IP42, RoHS, IEC/EN61010-1: 2010, 6' Drop Protection
- Battery Type: (AA) 4
- Test Leads: Silicone test leads w/ alligator clips (red and black) (ATL57), Remote Probe
- Accuracy: ± (% of reading + # of least significant digits)
- Bargraph: 30 segment

IMPORTANT SAFETY WARNINGS

WARNING

Read entire Safety Notes section regarding potential hazard and proper instructions before using this meter. In this manual the word “**WARNING**” is used to indicate conditions or actions that may pose physical hazards to the user. The word “**CAUTION**” is used to indicate conditions or actions that may damage this instrument.

WARNING

To ensure safe operation and service of the tester, follow these instructions. Failure to observe these warnings can result in severe injury or death.

WARNING

- Before each use, verify meter operation by measuring a known voltage.
- Never use the meter on a circuit with voltages that exceed the category based rating of this meter.
- Do not use this meter during electrical storms or in wet weather.
- Do not use the meter or test leads if they appear damaged.
- Ensure meter leads are fully seated and keep fingers away from the metal probe contact when making measurements. Always grip the leads behind the finger guards molded into the probe.
- Do not open the meter to replace batteries while the probes are connected.
- To avoid false readings that can lead to electrical shock, replace batteries if a low battery indicator appears.
- Unless measuring voltage, shut off and lockout power before measuring resistance.
- Always adhere to national and local safety codes. Use proper personal protective equipment (PPE) to prevent shock and arc blast injury where hazardous live conductors are exposed.
- Always turn off power to a circuit or assembly under test before cutting, unsoldering or breaking the current path. Even small amounts of current can be dangerous.
- Always disconnect the live test lead before disconnecting the common test lead from the circuit.
- In the event of electrical shock, ALWAYS bring the victim to the emergency room for evaluation, regardless of victim's apparent recovery. Electrical shock can cause unstable heart rhythms that may need medical attention.
- If any of the following occur during testing, turn off the power source to the circuit being tested: arcing, flame, smoke, extreme heat, smell of burning materials or discoloration or melting of components.
















WARNING

Higher voltages require greater awareness of physical safety hazards. Before connecting the test leads; turn off power to the circuit under test, set meter to the desired function and range; connect the test leads to the meter first, then connect to the circuit under test. Reapply power. If an erroneous reading is observed, disconnect power immediately and recheck all settings and connections.

WARNING

This meter is designed for trade professionals who are familiar with the hazards of their trade. Observe all recommended safety procedures that include proper lockout utilization and use of personal protective equipment that includes safety glasses, gloves and flame resistant clothing.

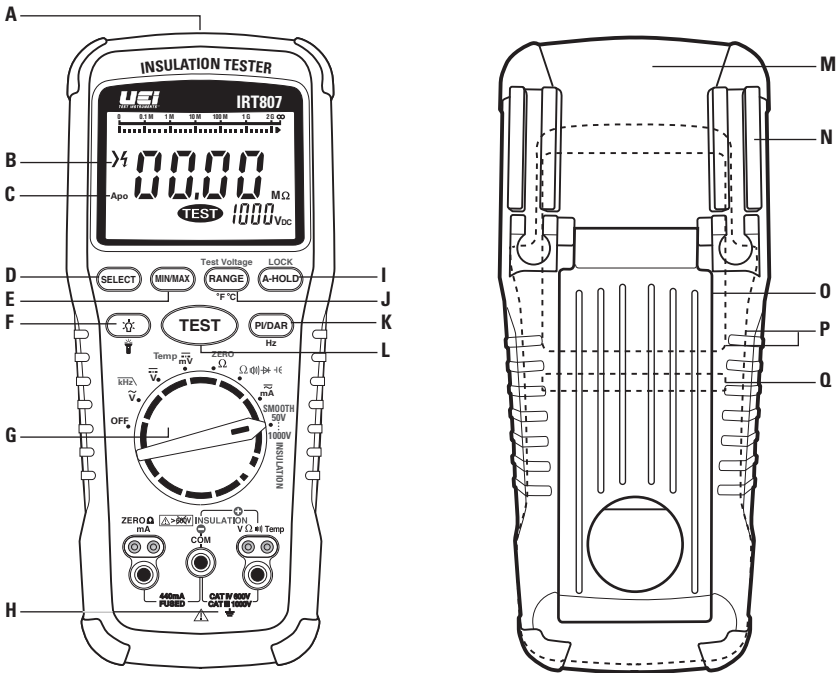
SYMBOLS

	AC Volts		DC Volts
	Warning		Fuse
	Ground	MAX	Maximum measured value displayed
	Low Battery	AVG	Average value displayed
MIN	Minimum measured value displayed		AC Voltage with "low-pass filter"
AUTO	Auto-ranging	Hz	Hertz/Frequency
°F	Degrees Fahrenheit	°C	Degrees Celsius
k Ω	KiloOhm	Ω	Ohms/Resistance
G Ω	GigaOhm	MΩ	MegaOhm
V_{DC}	1000V to 50V (Source Voltage)	RUN TIME	Run Time
LOCK	LOCK	TEST	TEST
	High Voltage	SMOOTH	SMOOTH
F	Capacitance	Temp	Temperature
	Diode test		Continuity
	Insulation Test		DCmV
PI DAR	PI/DAR (Polarization Index/Dielectric Absorption Ratios)		mA (Milliamp) AC/DC
A-HOLD	Auto HOLD	ZERO	ZERO
	Greater Than	HOLD	HOLD
	30 Segment Bargraph	Apo	Auto power off active

CATEGORY DEFINITIONS

Measurement Category	Short-Circuit (typical) kA ^a	Location in the building installation
II	< 10	Circuits connected to mains socket outlets and similar points in the MAINS installation
III	< 50	Mains distributions parts of the building
IV	> 50	Source of the mains installation in the building

OVERVIEW AND OPERATING INSTRUCTIONS



A. Worklight: Lights work area in dark work environments.

B. Display: High contrast and backlight.

C. Apo: Auto power off after 10 minutes of use

D. Select Button:

- Used to choose measurement mode from a single dial selection.
- Press this button to activate smoothing during insulation testing.

E. Min/Max Button: Press to capture Minimum, Maximum and Average values. Press again to cycle through readings. Press and Hold to exit.

- Press x1 to capture Maximum value
- Press x2 to capture Minimum value
- Press x3 to capture Average value
- Press repeatedly to scroll through results.

F. Backlight/ Worklight: Press to turn on worklight and backlight.

G. Function Dial: Turns on meter and is used to select the function.

H. Category Max Indicator: Maximum CAT Rating for input jacks.

- Use CATIII test leads or higher
- Zero/Ω Test Lead Port: Fused, used for Zero Ohms and mA.
- Common Test Lead Port:
- Volt/Insulation Test Lead Port: CATIV 600V/CATII 1000V, used for Volts, Resistance, Continuity, Diode, Capacitance, Temperature and Insulation test

I. A-Hold Button/Lock Button:

- Press x1 for Hold mode.
- Press x2 for A-Hold mode.
- In Insulation or Earth-bond resistance Test mode, when pressed before the **Test Button**, the test remains active until you press the lock or test button again to release the lock.

J. Range/Test Voltage/Temperature Scale Button:

- Press and hold to return to Auto Ranging mode
- Press to select desired voltage
- Press to select °F or °C

K. PI/DAR/Hz (Polarization Index/Dielectric Absorption Ratio) Button: Use PI for test of insulation deterioration and DAR for extended insulation resistance test.

- Press x1 for PI mode.
- Press x2 for DAR mode.
- Press for Hz/Frequency measurement in AC Volts mode and AC mA mode.

L. Test Button: Initiate test function

M. Protective Rubber Boot: With molded comfortable grip.

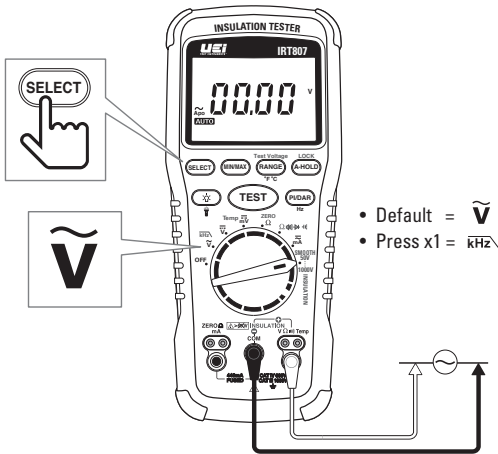
N. Test Lead Holders: For hand-free use and storage of the test probes.

O. Kick Stand: For easy viewing of screen when testing.

P. Battery and Fuse Cover (under protective rubber boot)

Q. Serial Number (under kick stand)

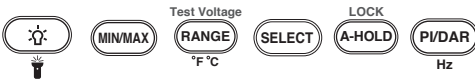
Voltage: <1000V AC



⚠ WARNING

- Use CATIII rated Test leads or higher.
- Do not attempt to measure more than 1000V AC.
- Keep hands below finger guards when measuring high voltage levels.

Features:



AC Volts (45Hz to 5kHz)

RANGE	RESOLUTION	ACCURACY (45Hz to 400Hz)	ACCURACY (400Hz to 5kHz)
400mV	0.1mV	±(1.0% +5 dgts)	±(2.0% + 3 dgts)
4V	0.001V		
40V	0.01V		
400V	0.1V	±(2.0% + 3 dgts)	±(2.0% + 3 dgts) ¹
1000V	1V		

1.1kHz bandwidth

Input impedance 10MΩ (nominal), <100pF, AC-coupled

Overload protection AC 1000V rms or DC

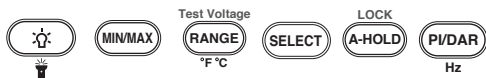
Voltage: with 1kHz "low-pass" filter <1000V

The IRT807 is equipped with an AC "low-pass" filter. When measuring AC voltage press the **Select Button** to activate the "low pass" filter function. The meter continues to measure in the selected AC mode, but the signal passes through the filter that blocks any unwanted frequencies above 1kHz. The "low-pass" filter can improve measurement performance on composite sine waves that are typically generated by frequency motor drives and inverters.

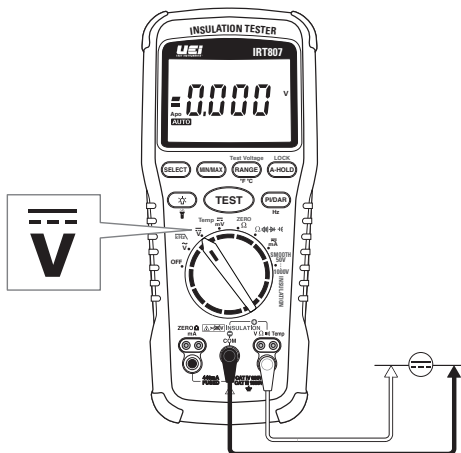
⚠ WARNING

- Use CATIII rated Test leads or higher.
- Do not attempt to measure more than 1000V AC.
- Keep hands below finger guards when measuring high voltage levels.

Features:



Voltage: <1000V DC



⚠ WARNING

- Use CATIII rated Test leads or higher.
- Do not attempt to measure more than 1000V DC.
- Keep hands below finger guards when measuring high voltage levels.

Features:



DC Volts

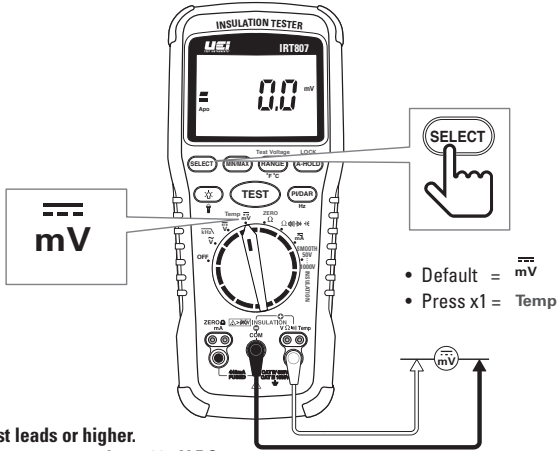
RANGE	RESOLUTION	ACCURACY
4V	0.001V	
40V	0.01V	±(0.2% +3 dgts)
400V	0.1V	
1000V	1V	±(0.3% +6 dgts)

Accuracies apply to 100% of range

Input impedance 10MΩ (nominal), <100pF

Overload protection AC 1000V rms or DC

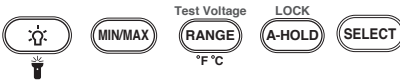
DC mV: 1mV to 400mV



WARNING

- Use CATIII rated Test leads or higher.
- Do not attempt to measure more than 400mV DC.
- Keep hands below finger guards when measuring high voltage levels.

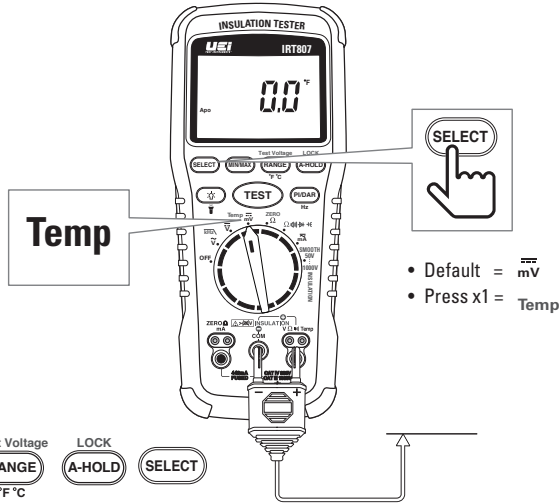
Features:



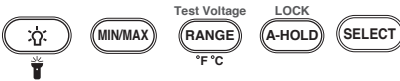
DC MILLIVOLTS

RANGE	RESOLUTION	ACCURACY
400mV DC	0.1mV	$\pm(0.2\% + 3 \text{ dgts})$

Temperature: -328° to 2462°F (-200° to 1350°C)



Features:



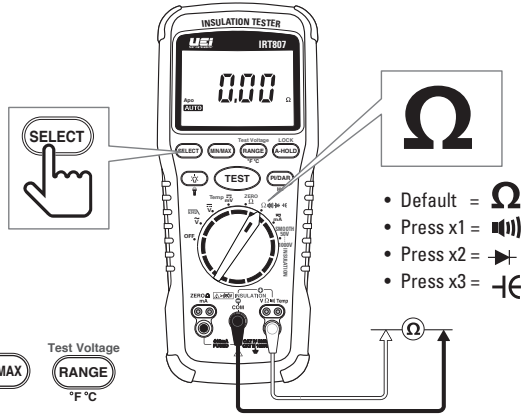
Fahrenheit is the default temperature measurement scale. Press the **Range Button** to switch to Celsius scale.

TEMPERATURE

RANGE	RESOLUTION	ACCURACY ¹
-328° to 999°F (-200° to 999°C)	0.1°F (0.1°C)	$\pm(1.5\% + 3.6^\circ\text{F} (1.5\% + 2^\circ\text{C}))$
1000° to 2642°F (1000° to 1350°C)	1°F (1°C)	$\pm(1.5\% + 3^\circ\text{F} (1.5\% + 2^\circ\text{C}))$

¹ Accuracies apply following 90 minutes setting time after a change in the ambient temperature of the instrument

Resistance



⚠ WARNING

- Do not measure resistance on a live circuit.

Features:



OHMS

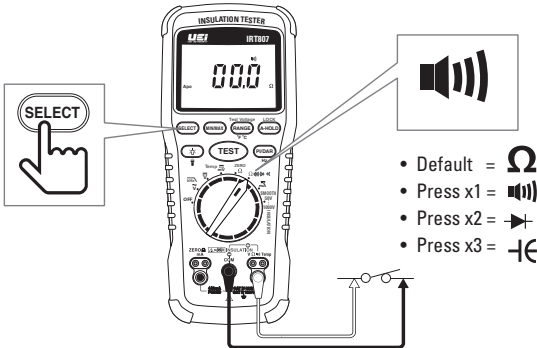
RANGE	RESOLUTION	ACCURACY
400Ω	0.1Ω	
4kΩ	0.001kΩ	±(0.3% +5 dgts)
40kΩ	0.01kΩ	
400kΩ	0.1kΩ	
4MΩ	0.001MΩ	±(0.7% +5 dgts)
40MΩ	0.01MΩ	±(1.2% +10 dgts)

1. Accuracies apply from 0 to 100% of range

Overload protection AC 600V rms or DC

Short circuit current <1.0mA

Continuity



⚠ WARNING

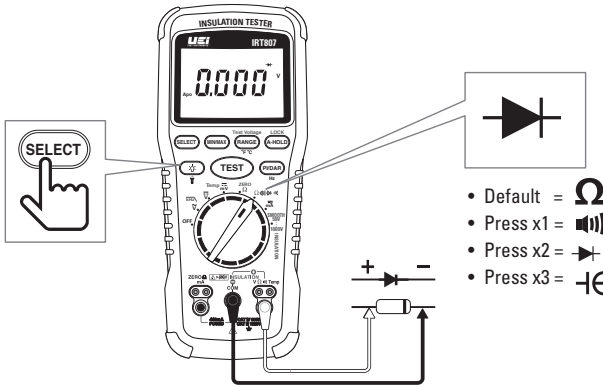
- Do not measure resistance on a live circuit.
- Beeper sounds constant as long as circuit is complete.
- Beeper sounds when a short (<40Ω) is detected.

Features:

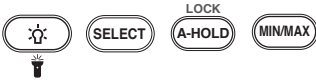


RANGE	RESOLUTION	ACCURACY	OVERLOAD PROTECTION
400.0Ω	0.1Ω	Approx. 40Ω	600V

Diode Test



Features:

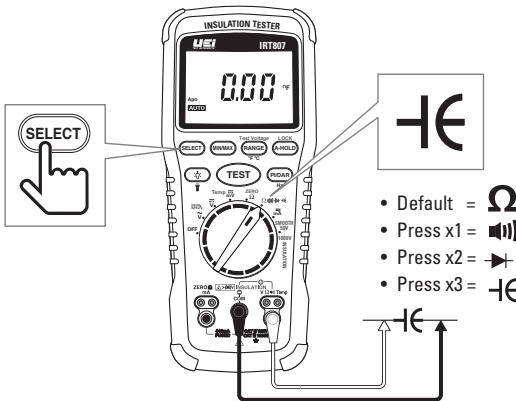


RANGE	RESOLUTION	ACCURACY	OVERLOAD PROTECTION
3V	0.001V	$\pm(2\% + 1 \text{ dgts})$	600V

⚠ CAUTION

Discharge all high-voltage capacitors before testing diodes. Large value capacitors should be discharged through an appropriate resistance load.

Capacitance



Features:



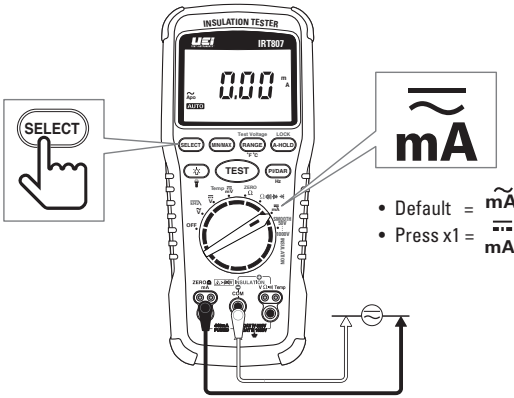
⚠ WARNING

Capacitors should be completely discharged prior to testing. Some electronic devices use capacitors in circuits that are designed to increase voltage. By design, a capacitor stores energy. If a capacitor has been charged at greater than 600 volts, attempting to measure it may damage your meter. Larger capacitors may store enough energy to cause injury if they are discharged through the body. Use a conductive device to dissipate the charge on capacitors. Large capacitors should be "bled" by using a resistive load between terminals to slowly eliminate the charge. Smaller capacitors may be directly shorted using a metallic object.

CAPACITANCE

RANGE	RESOLUTION	ACCURACY	OVERLOAD PROTECTION
10.00nF	0.01nF	$\pm(2.5\% + 5 \text{ dgts})$	600V
100.0nF	0.1nF		
1.000μF	0.001μF		
10.00μF	0.01μF		
100.00μF	0.1μF		
1000μF	1μF	$\pm(3\% + 5 \text{ dgts})$	600V
10000μF	1μF		

mAmps AC/DC

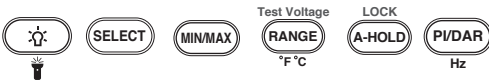


⚠ WARNING

Never connect the test leads across (in parallel with) a voltage source when attempting to measure current. This can cause damage to the circuit under test or this meter.

Note: To measure current, you must create a break in the circuit under test and make the meter part of the circuit. Two connection points are created when a circuit is broken. On one side is the power source and the other is the load.

Features:

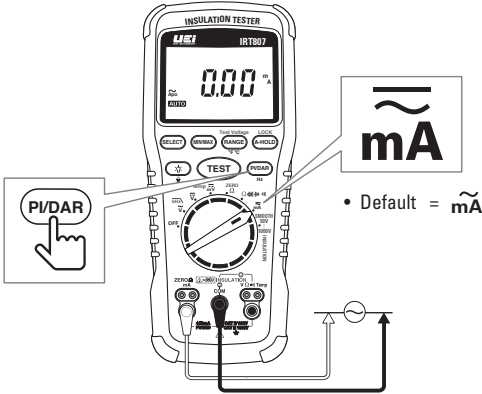


AC and DC CURRENT	RANGE	RESOLUTION	ACCURACY
AC (45Hz to 1000Hz)	40mA	0.01mA	±(1.5% +5 dgts) ¹
	400mA	0.1mA	
DC	40mA	0.01mA	±(0.5% +5 dgts)
	400mA	0.1mA	

1. 1kHz bandwidth

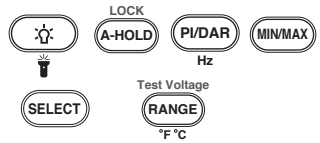
Overload Protection 440mA, 1000V, FAST fuse

Frequency



The meter measures the frequency of a voltage or current signal by counting the number of times the signal crosses a threshold level each second. To measure Frequency, set selector dial Volt or Milliamp position. In the mA position, press the **SELECT** button to select AC, if needed. Press the **P/DAR** button.

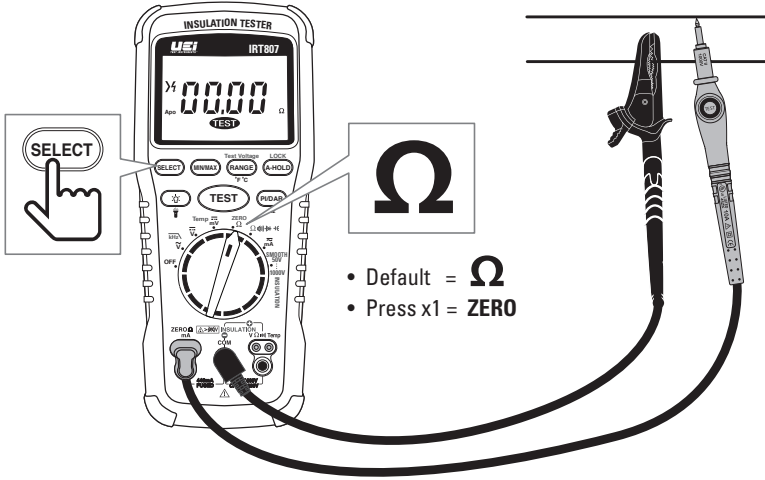
Features:



RANGE	RESOLUTION	ACCURACY
99.99Hz	0.01Hz	±(0.1% +3 dgts)
999.9Hz	0.1Hz	
9.999kHz	0.001kHz	
99.99kHz	0.01kHz	

Sensitivity: >AC 1V RMS, >AC 10mA

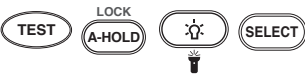
Earth-bond Resistance



NOTE: Measurements can be adversely affected by impedances of additional operating circuits connected in parallel or transient currents.

1. Insert test leads into the Zero/ Ω and Com input ports.
2. Turn the rotary dial selector to the Zero/ Ω position.
3. Short the test leads together. Press the **SELECT Button** and wait until ZERO appears on the display. The tester measures the probes resistance, stores the value in memory and subtracts it from tests. The probes resistance is saved even when the tester is powered off. If the probes resistance is $>2\Omega$, the resistance will not be saved.
4. Connect the test leads to the circuit to be tested. The tester will automatically detect if the circuit is energized.
5. The dashes (---) will display until the **TEST Button** is pressed and a valid resistance value is detected.
6. The High Voltage symbol will display if greater than 2V AC/DC is present.
If this is happens, the test is corrupted. Disconnect the test leads and remove power before testing again.
7. Press and hold the **TEST Button** on the Meter or Remote Probe to start the test. The TEST symbol will appear on the display until the **TEST Button** is released. The resistance value is displayed until a new test is started or a different function or range is selected.

Features:



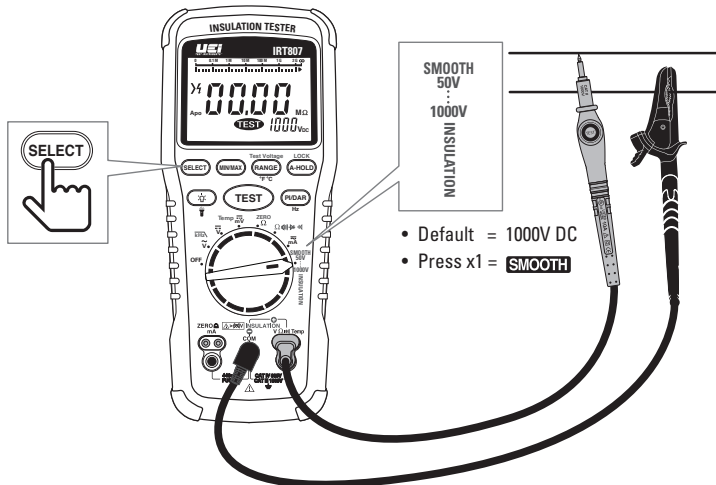
NOTE: When the resistance is higher than the maximum display range the tester displays the > symbol and the maximum resistance for the range.

⚠ WARNING

NEVER test resistance on a live circuit. (Overload Protection: AC 2V rms or DC)

RANGE	RESOLUTION	ACCURACY ¹
20.00 Ω	0.01 Ω	$\pm(1.5\% +3 \text{ dgts})$
200.0 Ω	0.1 Ω	
2000 Ω	1 Ω	
20.00k Ω	0.01k Ω	

1. Accuracies apply from 0 to 100% of range
2. Open Circuit Test Voltage: $> 4.0V, < 8V$
3. Short Circuit Current: $> 200.0 \text{ mA}$



Features:



NOTE: When the resistance is higher than the maximum display range the tester displays the > symbol and the maximum resistance for the range.

⚠ WARNING:

To avoid the risk of electrical shock and instrument damage, input voltages must not exceed the limits specified for the installation category you are working in. DO NOT attempt to take any unknown voltage measurements that may exceed these values.

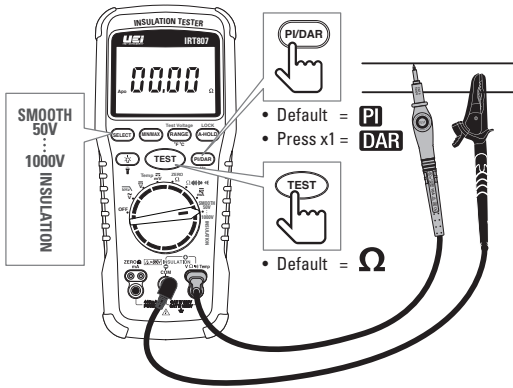
Note: When taking voltage measurements your meter must be connected in parallel to the circuit, or circuit element, under test.

- Set Rotary dial to INSULATION and press **RANGE** button to select desired voltage.
- The display will show “----” until the button is pressed.
- The High Voltage Symbol will display if greater than 30V AC or DC is present.
- Press and hold the **TEST** button on the Meter or Remote Probe to start the test. Test stops when the **TEST** button is released.
- Keep test leads on test points after **TEST** button is released. The circuit under test will then discharge.

OUTPUT VOLTAGE	DISPLAY RANGE	RESOLUTION	TEST CURRENT	ACCURACY
50V (0% to +20%)	0.01 to 6.00MΩ	0.01MΩ	1mA @ 50kΩ	±(3% +5dpts)
	6.0 to 50.0MΩ	0.1MΩ		
100V (0% to +20%)	0.01 to 6.00MΩ	0.01MΩ	1mA @ 100kΩ	±(3% +5dpts)
	6.0 to 60.0MΩ	0.1MΩ		
250V (0% to +20%)	0.1 to 60.0MΩ	0.1MΩ	1mA @ 250kΩ	±(1.5% +5dpts)
	60 to 250MΩ	1MΩ		
500V (0% to +20%)	0.1 to 60.0MΩ	0.1MΩ	1mA @ 500kΩ	±(1.5% +5dpts)
	60 to 500MΩ	1MΩ		
1000V (0% to +20%)	0.1 to 60.0MΩ	0.1MΩ	1mA @ 1MΩ	±(1.5% +5dpts)
	60 to 600MΩ	1MΩ		
	0.6 to 2.0GΩ	0.1GΩ		

1. Measurement Range: 0.01MΩ to 2GΩ
2. Test Voltages: 50, 100, 250, 500, 1000V
3. Test Voltage Accuracy: 0 to +20%
4. Short-Circuit Test Current: 1mA nominal
5. Auto Discharge: Discharge time <0.5 sec. for C = 1μF or less
6. Live Circuit Detection: Inhibit test if terminal voltage >30V prior to initialization of test
7. Maximum Capacitive Load: Operable with up to 1μF load

Measuring Polarization Index and Dielectric Absorption Ratios



Polarization Index (PI) is the ratio of the 10-minute insulation resistance. Dielectric Absorption Ratio is the ratio of the 1-minute insulation resistance to the 30-second insulation resistance.

⚠ WARNING

• **Insulation tests should only be performed on de-energized circuits.**

To measure polarization index or dielectric absorption ratio;

• Use insulation and COM Input ports.

NOTE: Because of the time required to perform the PI and DAR tests, use of alligator clips is recommended.

• Set rotary function dial to INSULATION position and press **RANGE** button to select desired voltage.

• Press the **PI/DAR** button to select PI or DAR.

• The display shows "----" until **TEST** button is pressed and a valid resistance is obtained.

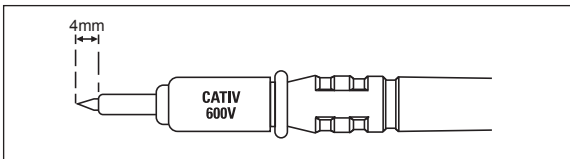
- The High Voltage symbol warns if voltage of greater than 30V AC or DC is present. If High voltage is present, test is inhibited.
- Press and release the **TEST** button on the Meter or the Remote Probe to start the test. During testing, the display shows the test voltage applied to the circuit under test. The high voltage symbol along with display showing resistance in M Ω or G Ω , the TEST icon appears on the lower portion of the display until the test is finished.
- To interrupt PI or DAR test before it is completed, press **TEST** button. When you release the **TEST** button, the circuit under test will automatically be discharged through the tester.



NOTE: Measurements can be adversely affected by impedances of additional operating circuits connected in parallel or transient currents.

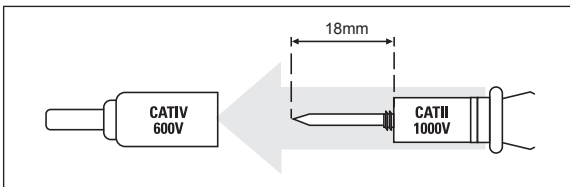
Test Lead Notes

CATIV 600V Measurement Locations



- Ensure the test lead shield is pressed firmly in place. Failure to use the CAT IV shield increases arc-flash risk.

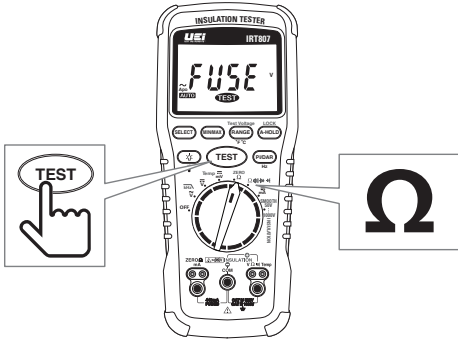
CAT II Measurement Locations



- CAT IV shields may be removed for CAT II locations. This will allow testing on recessed conductors such as standard wall outlets. Take care not to lose the shields.

⚠ WARNING: Test Lead category protections apply only to test leads and should not be confused with the meter's specific CAT rating. Observe the maximum category protection indicated on the meter the test leads are plugged into.

Testing the Fuse

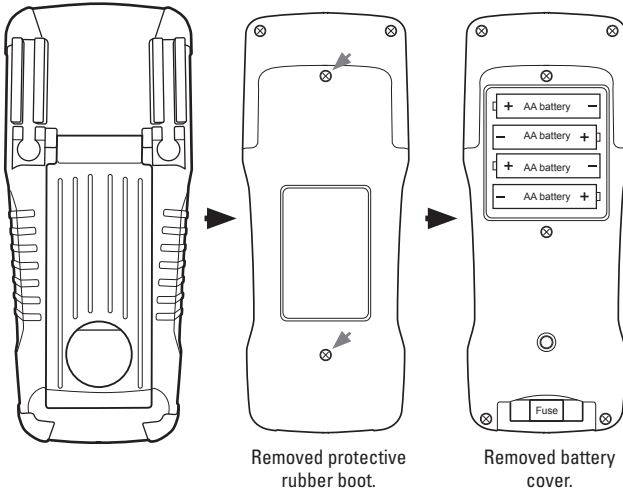


- Turn the rotary selector dial to **ZERO/Ω** position.
- Press and hold the **TEST** button. If the display shows "FUSE", the fuse is bad and should be replaced. Please see Fuse Replacement section of this manual.

⚠ WARNING:

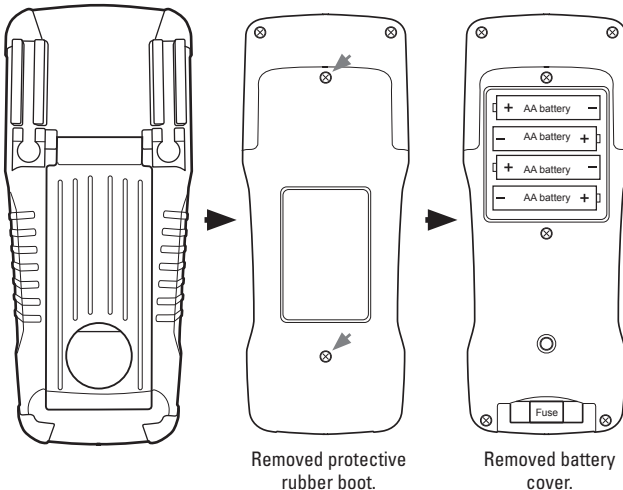
- To avoid electrical shock or injury, remove the test leads and any input signals/voltages before replacing the fuse.

Battery Replacement



- **+** **-** When the batteries are too low for safe operation, the Low Battery indicator will display
- Remove protective rubber boot.
- Remove battery cover.
- Replace the batteries (4 AA).
- Replace the battery cover
- Replace the protective rubber boot.

Fuse Replacement



- Remove protective rubber boot.
- Remove battery cover.
- Replace the fuse (F 440mA 1000V 1R 10kA).
- Replace the battery cover.
- Replace the protective rubber boot.

DISPOSAL



CAUTION: This symbol indicates that equipment and its accessories shall be subject to separate collection and correct disposal.

CLEANING

Periodically clean your meter's case using a damp cloth. DO NOT use abrasive, flammable liquids, cleaning solvents, or strong detergents as they may damage the finish, impair safety, or affect the reliability of the structural components.

STORAGE

Remove the batteries when instrument is not in use for a prolonged period of time. Do not expose to high temperatures or humidity. After a period of storage in extreme conditions exceeding the limits mentioned in the General Specifications section, allow the instrument to return to normal operating conditions before using it.

WARRANTY

The IRT807 is warranted to be free from defects in materials and workmanship for a period of 1 year from the date of purchase. If within the warranty period your instrument should become inoperative from such defects, the unit will be repaired or replaced at UEI's option. This warranty covers normal use and does not cover damage which occurs in shipment or failure which results from alteration, tampering, accident, misuse, abuse, neglect or improper maintenance. Batteries and consequential damage resulting from failed batteries are not covered by warranty.

Any implied warranties, including but not limited to implied warranties of merchantability and fitness for a particular purpose, are limited to the express warranty. UEI shall not be liable for loss of use of the instrument or other incidental or consequential damages, expenses, or economic loss, or for any claim or claims for such damage, expenses or economic loss.

A purchase receipt or other proof of original purchase date will be required before warranty repairs will be rendered. Instruments out of warranty will be repaired (when repairable) for a service charge.

This warranty gives you specific legal rights. You may also have other rights, which vary from state to state.