

REED

Model ST-3347

AC/DC True RMS
Clamp Meter



Instruction Manual

www.reedinstruments.com

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Measuring Limits

DC Amperes: 0.01A to 1000A

DC Voltage: 0.1mV to 600V

Resistance: 0.1 Ω to 40M Ω

Frequency: 0.001 kHz to 4kHz

AC Amperes: 0.01A to 1000A

AC Voltage: 0.1mV to 600V

Capacitance: 0.001 nF to 40mF

Temperature: -40°C to 1000°C

-40°F to 1832°F

Safety Information

This manual contains information that must be followed to operate the meter safely and maintain the meters safe operating condition. If the meter is not used in a manner specified in this manual, the protection provided by the meter may be impaired.

The model has been designed and complies With IEC 61010-1 and EN 61010-1 Safety Requirements for Electronic Measuring Apparatus.



WARNING

- Read through the operating instructions thoroughly and understand the instructions before operating the meter.
- Keep the manual at hand so as to enable quick reference when necessary
- Ensure that the use of the meter is in its intended applications and follow measurement procedures described in this manual.
- Follow all safety and operating instructions to ensure maximum personal safety during the use and operation of the meter.
- Failure to follow the above instructions may cause injury, instrument damage and/or damage to the equipment under test.
- The symbols indicated on the meter means that the user must refer to related parts in the manual for safe operation of the meter. Be sure to carefully read the instructions following each symbol in this manual.



DANGER is reserved for conditions and actions that are likely to cause serious or fatal injury.



WARNING is reserved for conditions and actions that are likely to cause serious or fatal injury.



CAUTION is reserved for conditions and actions that are likely to cause minor injury.



Danger

- Never use the meter to measure voltages on a circuit above the maximum allowable input value on any function.
- Do not exceed the maximum allowable input of any measurement range.
- Never touch exposed wiring, connections or any live circuit when attempting to take measurements.
- Do not attempt to make measurements in flammable gaseous areas, fumes, vapor or dust. The use of the instrument in these areas may cause sparking, which can lead to an explosion.
- Do not attempt to use the instrument if its surface or your hand is wet.
- Never open the battery compartment cover when making measurements.



Warning

- Always inspect the meter and test leads for any signs of damage or abnormalities before use. If the meter or its accessories have any structural defects such as broken test leads, cracked cases, exposed metal parts or the display is not reading, do not attempt to make measurements.
- Do not turn the function switch while test leads are connected to the meter.
- Do not install substitute parts or make modifications to the meter. Return the meter to your distributor for repair or re-calibration. For service on this or any other REED product, contact REED Instruments at info@reedinstruments.com.
- Ensure the meter is switched off before opening the battery cover when replacing the battery.
- Never replace a battery if the surface of the meter is wet or moist.



Caution

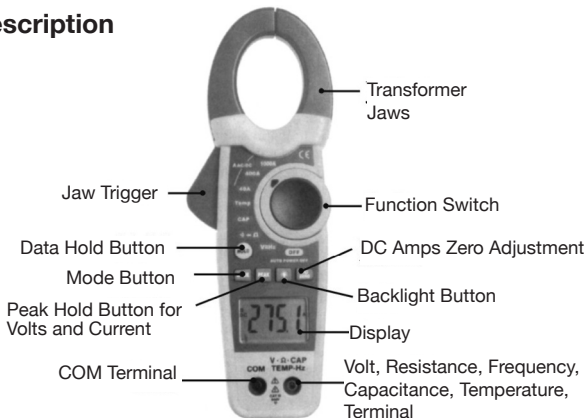
- Before making measurements ensure that the function selector switch is set on the appropriate range position.
- Always make sure that the plug of each test lead is inserted fully into the appropriate terminal of the meter.
- Ensure that the function selector switch is set to the “OFF” position after use. When the meter will not be in use for a long period of time, place it in storage after removing the battery.
- Do not expose the meter to direct sunlight, extreme temperatures or moisture.
- Do not use abrasives or solvents on the meter. To clean it use a damp cloth and mild detergent only. Only qualified and trained service technicians should perform calibration and repair of the meter.

For service on this or any other REED product, contact REED Instruments at info@reedinstruments.com.


Features

- True RMS measurement of AC Current and AC Voltage
- Large 4000 count LCD display with a bargraph and a bright white LED backlight.
- Wide measuring range from 0.01A AC/DC up to 1000A AC/DC
- Measures AC and DC Voltage up to 600 volts
- Measures resistance from 0.01 Ω up to 40M Ω .
- Capacitance measurements up to 40mF
- Temperature measurements from -40°C to +1000°C and -40°F to +1832°F
- Designed to the international safety standard IEC61010 CAT III 600V / CAT II 1000V. Pollution degree 2.
- Auto Power Off after approximately 20 minutes to conserve battery life.
- Continuity Buzzer and Diode Test.
- Frequency measurement up to 4kHz.
- Peak Hold to record the minimum and maximum readings for current & voltage.
- Data Hold switch used to freeze reading on display

Meter Description



Specifications

Clamp Size	30mm Opening Approx
Diode Test	Test Current of 0.3mA typical; Open circuit voltage 1.5V DC
Continuity Check	Threshold < 35 Ω ; Test current < 1mA
Low Battery indication	 is displayed
Overrange Indication	"OL" is displayed
Measurements Rate	2 per second, nominal
Input Impedance	10M Ω (VDC and VAC)
Display	4000 count LCD
AC Current	50/60Hz (AAC)
AC Voltage Bandwidth	50/60Hz (VAC)
Operating Temperature	-10 $^{\circ}$ C to 50 $^{\circ}$ C (14 $^{\circ}$ F to 122 $^{\circ}$ F)
Storage Temperature	-30 $^{\circ}$ C to 60 $^{\circ}$ C (-22 $^{\circ}$ F to 140 $^{\circ}$ F)
Relative Humidity	Up to 85%
Over Voltage	Category III 600V
Battery	One DC 9V IEC 6F22. 1604. Battery
Auto Power Off	Approx 20 minutes
Dimensions	229 x 80 x 49mm
Weight	303g

Range	Measuring Range	Resolution	Accuracy (% of Reading)
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DC CURRENT

40A	0 ~ 40.00A	0.01A	± (2.8% + 10 digits)
400A	0 ~ 400.0A	0.1A	± (2.8% + 8 digits)
1000A	0 ~ 1000A	1A	± (3.0% + 8 digits)

AC CURRENT

40A	0 ~ 40.00A	0.01A	± (2.8% + 10 digits)
400A	0 ~ 400.0A	0.1A	± (2.8% + 8 digits)
1000A	0 ~ 1000A	1A	± (3.0% + 8 digits)

DC VOLTAGE

400mV	0 ~ 400mV	0.1 mA	± (0.8% + 2 digits)
4V	0 ~ 4.000V	0.001V	
40V	0 ~ 40.00V	0.01V	± (1.5% + 2 digits)
400V	0 ~ 400.0V	0.1V	
600V	0 ~ 600A	1V	± (2.0% + 2 digits)

AC VOLTAGE

400mV	0 ~ 400mV	0.1 mA	± (1.0% + 10 digits)
4V	0 ~ 4.000V	0.001V	
40V	0 ~ 40.00V	0.01V	± (1.5% + 8 digits)
400V	0 ~ 400.0V	0.1V	
600V	0 ~ 600A	1V	± (2.0% + 8 digits)
Note: No Autoranging on 400mV AC Range			

RESISTANCE

400Ω	0 ~ 400.0Ω	0.1Ω	± (1.0% + 4 digits)
4kΩ	0 ~ 4.000kΩ	1Ω	
40kΩ	0 ~ 40.00kΩ	10Ω	± (1.5% + 2 digits)
400kΩ	0 ~ 400.0kΩ	100Ω	
4MΩ	0 ~ 4.000MΩ	1kΩ	± (2.5% + 5 digits)
40MΩ	0 ~ 40.00MΩ	10kΩ	± (3.5% + 10 digits)

CAPACITANCE

4nF	0 ~ 4.000nF	0.001nF	± (5.0% + 30 digits)
40nF	0 ~ 40.00nF	0.01nF	± (5.0% + 20 digits)
400nF	0 ~ 400.0nF	0.1nF	± (3.0% + 5 digits)
4μF	0 ~ 4.000μF	0.001μF	
40μF	0 ~ 40.00μF	0.01μF	± (4.0% + 10 digits)
400μF	0 ~ 400.0μF	0.1μF	
4mF	0 ~ 4.000mF	0.001mF	± (4.5% + 10 digits)
40mF	0 ~ 40.00mF	0.01mF	± (5.0% + 10 digits)

FREQUENCY

4kHz	0 ~ 4.000kHz	0.001kHz	± (1.5% + 2 digits) Sensitivity: 5Vrms min
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TEMPERATURE

°C	-40°C ~ 1000°C	1°C	± (2.5% + 3°C)
°F	-40°F ~ 1832°F	1°F	± (2.5% + 5°F)

DC Current Measurement



Warning

Ensure that the test leads are disconnected from the meter before making current measurements.

1. Set the Function switch to **1000A** or **400A** or **40A** range position, and make sure that the current under test does not exceed the upper limit of the measuring range you have selected. The meter automatically defaults to DC Current.
2. Press the **DC ZERO** button once, the Δ sign will appear on the LCD indicating Range is zero.
3. Press the trigger to open up the transformer jaws and clamp around the single conductor under test.
4. Read the display.

Notes:

- During current measurements keep the transformer jaws fully closed, otherwise it will affect the accuracy of the measurement.
- When large currents the transformer jaws may buzz. This is not a fault and does not affect the accuracy of the reading.

Correct Current Measurement



Incorrect Current Measurement



AC True RMS Current Measurement



Warning

Ensure that the test leads are disconnected from the meter before making current measurements.

1. Set the function switch to **1000A~** or **400A~** or **40A~** range position, and make sure that the current under test does not exceed the upper limit of the measuring range you have selected
2. Press the **MODE** button to select the AC Current range. The meter automatically defaults to DC current
3. Press the trigger to open up the transformer jaws and clamp around the single conductor under test.
4. Read the display.

Notes:

- During current measurements keep the transformer jaws fully closed, otherwise this will affect the accuracy of the measurement.
- When large currents the transformer jaws may buzz. This is not a fault and does not affect the accuracy of the reading.
- The meter is set to default to “Auto Range” mode.
- Pressing the **PEAK** hold button will allow the user to record the peak maximum and minimum readings on the AC volt range. See page 17 for further Instructions for “PEAK” Hold function

Correct Current Measurement

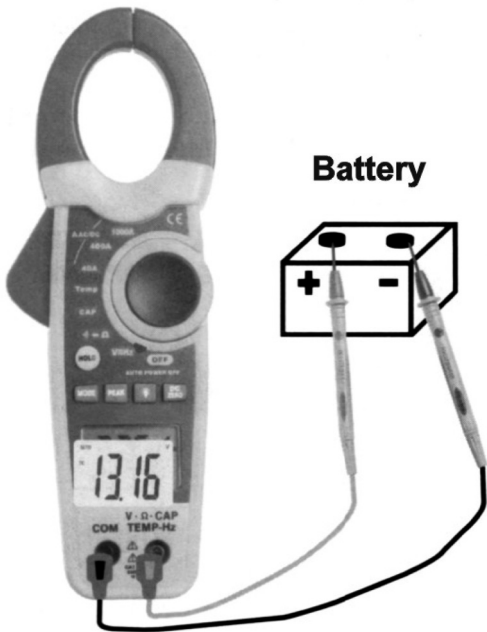


Incorrect Current Measurement



DC Voltage Measurement

1. Set the Function switch to **V $\overline{\text{=}}$ Hz** range position.
The meter automatically defaults to DC Volts.
2. Insert the red test lead into the “**V Ω TEMP HZ**” input terminal and the black lead to the “**COM**” terminal.
3. Connect the other end of the test leads to the circuit under test.
4. Read the display. If a “-” sign is displayed, the red lead is the negative potential.

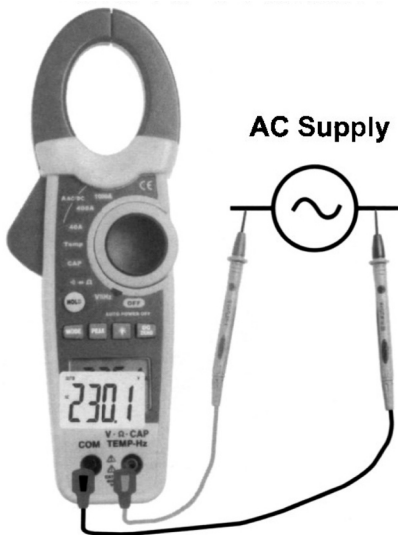


AC True RMS Voltage Measurement


1. Set the function switch to **V_~Hz** range position.
2. Press the **MODE** button to select the AC Volt range.
The meter automatically defaults to DC Volts.
3. Insert the red test lead into the “**V Ω TEMP HZ**” input terminal and the black lead to the “**COM**” terminal.
4. Connect the other end of the test leads to the circuit under test.
Take the reading on the display.

Notes:

- The meter is set to default to “Auto Range” mode
- Pressing the “**PEAK**” hold button will allow the user to record the peak maximum and minimum readings on the AC volt range. See page 17 for further instructions for “**PEAK**” Hold function.



Resistance Measurement


1. Set the function switch to  range position. The meter automatically defaults to resistance range.
2. Insert the red test lead into the “**V Ω TEMP HZ**” input terminal and the black lead to the “**COM**” terminal.
3. Connect the other end of the test leads to the circuit or component under test. Take the reading on the display.

Notes:


- The meter is set to default to “Auto Range” mode
- **WARNING** before attempting to make a resistance measurement, ensure there is no voltage present on the circuit under test.

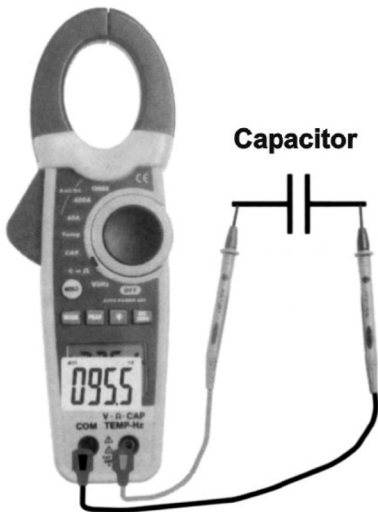


Capacitance Measurement

1. Set the function switch to  range position.
2. Insert the red test lead into the “**V Ω TEMP HZ**” input terminal and the black lead to the “**COM**” terminal.
3. Connect the other end of the test leads to the circuit or component under test. Take the reading on the display.

Notes:

- In Capacitance range the meter is Auto Ranging only.
-  **CAUTION** to avoid damage to the meter or the equipment under test, remove all power from the circuit and discharge all capacitors before measuring capacitance.
- Large value capacitors should be discharged through an appropriate resistance load. Use the DC Voltage function to confirm that the capacitor is discharged.



Frequency Measurement

1. Set the function switch to **V \approx Hz** range position.
The meter automatically defaults to Frequency range.
2. Press the **MODE** button for 3 seconds to select the Frequency range.
The meter automatically defaults to DC Volts.
3. Insert the red test lead into the "**V Ω TEMP HZ**" input terminal and the black lead to the "**COM**" terminal.
4. Connect the other end of the test leads to the circuit or component under test. Take the reading on the display.

Note:

- In the Frequency range the meter is Auto Ranging only.



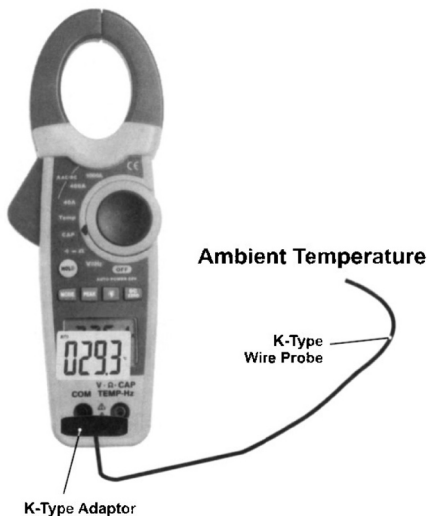
**Measuring Frequency
on AC Supply**

Temperature Measurement


1. Set the function switch to **TEMP** range position.
The meter automatically defaults to °C range.
2. Insert the meter white temperature adaptor into the “**V Ω TEMP HZ**” input terminal and the “**COM**” terminal. Ensure that the “-” marking on the adaptor is inserted into the “**COM**” terminal and the “+” marking on the adaptor is inserted into the “**V Ω TEMP HZ**” Input terminal.
3. Connect any K-Type probe into the meter adaptor and measure the temperature of the apparatus or area required.
4. Read the temperature directly on the display.
5. To change the measuring unit from °C to °F, Press the **MODE** button to select the °F unit.

Note:

- The meter is set to default to “Auto Range” mode.

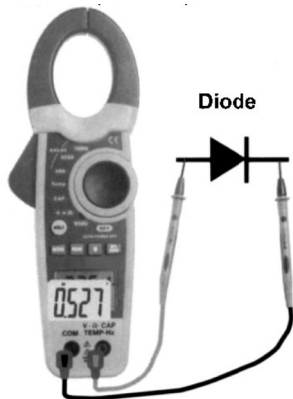


Diode Test


1. Set the function switch to  range position.
2. Press the **MODE** button to select the Diode Test range.
The meter automatically defaults to Resistance.
3. Insert the red test lead into the “**V Ω TEMP HZ**” input terminal and the black lead to the “**COM**” terminal.
4. Connect the other end of the test leads to the component under test.
Read the display.

Notes:


- Use the diode test to check diodes, transistors, silicon controlled rectifiers (SCR's) and other semiconductor devices
- The test sends a current through a semiconductor junction, then measures the junction's voltage drop.
- Normal forward voltage drop (forward bias) for a good silicon diode is between 0.4V to 0.9V. A reading higher than that indicates a leaky (defective) diode. A zero reading indicates a shorted diode.
- Reverse the test leads connection (reverse bias) across the diode. The display shows “**OL**” if the diode is good. Any other readings indicate the diode is shorted or resistive (Defective).



Continuity Testing

1. Set the function switch to  range position.
2. Press the **MODE** button to select the Continuity Test range. The meter automatically defaults to Resistance.
3. Insert the red test lead into the “**V Ω TEMP HZ**” input terminal and the black lead to the “**COM**” terminal.
4. Short the tip of the test leads and make sure the display reads “0” and the buzzer beeps.
5. Connect the tip of the test leads to the circuit or component under test. The display reads the resistance and the buzzer beeps when the reading is not more than about 35Ω .

Notes:

- Using resistance and continuity function in a live circuit will produce false results and may damage the instrument.
- In many cases the suspicious components must be disconnected from the circuit under test to obtain accurate results.
-  **WARNING** before attempting to make a test, ensure there is no voltage present on the circuit.



Data Hold

This is a function used to freeze the reading on the display, ideal for later viewing.

1. Press the **HOLD** button once. When the Hold is activated, the meter beeps, freezes the reading, and displays the “**HOLD**” indicator on the LCD.
2. To deactivate the “**HOLD**” function, press **HOLD** button once, the meter will beep and the meter will start reading a new measurements.



Peak Hold

This is a function used to record the maximum and minimum readings on the display for the voltage and current ranges.

1. Press the **PEAK** button once. This will record The “**PEAK**” maximum, the meter beeps, and display the “**P MAX**” indicator on the LCD.
2. Press the **PEAK** button again. This will record the “**PEAK**” maximum, the meter beeps, and display the “**P MIN**” indicator on the LCD.
3. To deactivate the “**PEAK**” function, press the button for 3 seconds, the meter will beep and the meter will start reading new measurements.

LCD Backlight

The backlight is ideally used in dark or dimly lit areas.

1. Press the  button for 3 seconds, and the bright white light will come on.
2. To turn off the backlight press the  button for 3 seconds.


Note: The use of the backlight will reduce the battery life considerably.

For service on this or any other REED product, contact REED Instruments at info@reedinstruments.com.

Auto Power Off

This feature automatically turns off the meter after approximately 20 minutes from the last measurement taken. To turn the meter back on, press any button or move the rotary switch to any position. Ensure the test leads are disconnected from any circuit to avoid injury or damage to the meter.

Battery Replacement

When the  sign appears on the LCD, this indicates the battery should be replaced. Use the following procedure to replace the standard 9V battery (IEC 6F 22) battery.

1. Disconnect the test leads from any live source and remove the leads from the input terminals.
2. Rotate the function switch to the **OFF** position.
3. The battery cover is secured to the bottom of the case by a screw. Using a screwdriver remove the screw from the battery cover and remove the battery cover from the meter.
4. Remove the old battery and replace it with a new IEC 6F 22 9V battery.
5. Replace the battery cover and reinstall the screw.

