

REED

Model ST-333

400A

AC/DC

Clamp Meter



Instruction Manual

www.reedinstruments.com

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Safety

International Safety Symbols



This symbol, adjacent to another symbol or terminal, indicates the user must refer to the manual for further information.



This symbol, adjacent to a terminal, indicates that, under normal use, hazardous voltages may be present



Double insulation

Safety Notes

- Do not exceed the maximum allowable input range of any function
- Do not apply voltage to meter when resistance function is selected.
- Set the function switch OFF when the meter is not in use.

Warnings

- Set function switch to the appropriate position before measuring.
- When measuring volts do not switch to current/resistance modes.
- Do not measure current on a circuit whose voltage exceeds 240V.
- When changing ranges using the selector switch, always disconnect the test leads from the circuit under test.
- Do not exceed the maximum rated input limits.

Cautions

Improper use of this meter can cause damage, shock, injury or death. Read and understand this user manual before operating the meter.

- Always remove the test leads before replacing the battery. Inspect the condition of the test leads and the meter itself for any damage before operating the meter.

Cautions con't

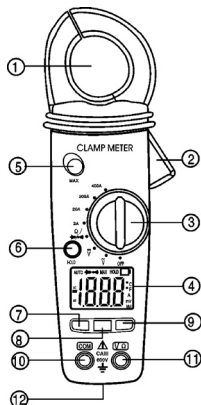
- Repair or replace any damage before use.
- Use great care when taking measurements when the voltages are greater than 25VAC rms or 35VDC. These voltages are considered a shock hazard.
- Remove the battery if the meter is to be stored for long periods.
- Always discharge capacitors and remove power from the device under test before performing Diode, Resistance or Continuity tests.
- Voltage checks on electrical outlets can be difficult and misleading because of the uncertainty of connection to the recessed electrical contacts. Other means should be used to ensure that the terminals are not “live”.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Input Limits

Function	Maximum Input
A AC,A DC	400A
V DC, V AC, Frequency, Duty Cycle	600V DC/AC
Resistance, Diode, Continuity, Capacitance Test	250V DC/AC
Temperature (°C/°F)	60V DC/24V AC

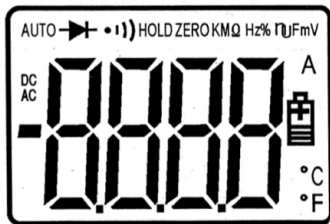
Meter Description

- 1- Current Clamp
- 2- Clamp Trigger
- 3- Rotary Function Switch
- 4- LCD Display
- 5- ZERO Button
- 6- Data Hold and Backlight Button
- 7- Mode Select Button
- 8- Range Select Button
- 9- Hz/% Duty Button
- 10- COM Input Jack
- 11- V Ω °C/°F Jack
- 12- Battery Cover



Display Descriptions


1. **DC** Direct Current
AC Alternating Current
2. **—** Minus Sign
3. **8888** 4000 Count
(0 to 3999)
Measurement Reading
4. **AUTO** AutoRange Mode
5. **ZERO** ZERO Mode
6. **→+** Diode Test Mode
7. **•||)** Audible Continuity
8. **HOLD** Data Hold Mode
9. **°C/°F, m, V, A, K, M, Ω** Units of Measure List



Specifications

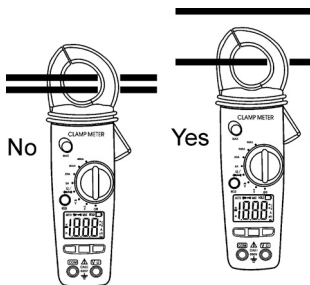
Function	Range & Resolution		Accuracy (% of reading)
DC Current	40.00 ADC	0~20.00ADC	± (2.5% + 6 digits)
		20.00~40.00ADC	± (3% + 6 digits)
	400.0 ADC	0~300.0ADC	± (2.5% + 6 digits)
		300.0~400.0ADC	± (3.5% + 6 digits)
AC Current	40.00 AAC	0~20.00AAC	± (3% + 10 digits)
		20.00~40.00AAC	± (5% + 10 digits)
	400.0 AAC	0~300.0AAC	± (3% + 10 digits)
		300.0~400.0AAC	± (5% + 10 digits)
DC Voltage	400.0 mVDC		± (0.8% + 3 digits)
	4.000 VDC		
	40.00 VDC		± (1.5% + 3 digits)
	400.0 VDC		
AC Voltage	600 VDC		± (2.0% + 3 digits)
	400.0 mVAC		± (1.0% + 10 digits)
	4.000 VAC		
	40.00 VAC		
	400.0 VAC		± (2.0% + 5 digits)
	600 VAC		
Resistance	400.0 Ω		± (1.0% + 4 digits)
	4.000KΩ		
	40.00KΩ		
	400.0KΩ		± (1.5% + 2 digits)
	4.000MΩ		
	40.00MΩ		
Capacitance	40.00nF		±(5.0% reading + 30 digits)
	400.0nF		±(3.0% reading + 5 digits)
	4.000μF		±(3.5% reading + 5 digits)
	40.00μF		
	100.0μF		±(5.0% reading + 5 digits)
Frequency	5.000Hz		±(1.5% reading + 5 digits)
	50.00Hz		±(1.2% reading + 2 digits) Sensitivity: 5~5kHz:10Vrms min. 5kHz~150kHz:40Vrms min. @ 20% to 80% duty cycle
	500.0Hz		
	5.000kHz		
	50.00kHz		
	150.0kHz		
Duty Cycle	0.5 to 99.0%		±(1.2% reading + 2 digits)
	Pulse width: 100μs - 100ms, Frequency: 5Hz to 150kHz; Sensitivity: 5~5kHz:10Vrms min.5kHz~150kHz:40Vrms min.		
Temp (type-K) (probe accuracy not included)	-50.0 to 400.0°C	-50.0 to -20.0°C	± 7°C
		-20.0 to 400.0°C	±(3.0% reading + 5 °C)
	400 to 1000°C	400 to 1000°C	
	-58.0 to 400.0°F	-50.0 to 0°F	± 14°F
		0 to 400.0°F	±(3.0% reading + 7°F)
400 to 1832°F	400 to 1832°F		

Specifications con't

Clamp Size	Opening 0.9" (23mm) approx
Diode Test	Test current of 0.3mA typical; Open circuit voltage 1.5V DC typical.
Continuity Check	Threshold <150Ω; Test current < 1mA
Low Battery Indication	"  " is displayed
Overrange Indication	"OL" is displayed
Measurements Rate	2 per second, nominal
Input Impedance	7.8MΩ (VDC and VAC)
Display	4000 counts LCD
AC Current	50/60Hz (AAC)
AC Voltage Bandwidth	50/400Hz (VAC)
Operating Temperature	14 to 122°F (-10 to 50°C)
Storage Temperature	-14 to 140°F (-30 to 60°C)
Relative Humidity	90% (0°C to 30°C); 75% (30°C to 40°C); 45% (40°C to 50°C)
Altitude	Operating: 3000m; Storage 10,000m
Over Voltage	Category III 600V
Battery	Two 1.5V "AAA" Batteries
Auto OFF	approx. 30 minutes
Dimensions/Weight	200 x 50 x 35mm/200g
Safety	For indoor use and in accordance with Overvoltage Category II, Pollution Degree 2. Category II includes local level, appliance, portable equipment, etc., with transient overvoltages less than Overvoltage Cat. III

Operation

NOTICE: Read and understand all **warning** and **precaution** statements listed in the safety section of this operation manual prior to using this meter. Set the function select switch to the OFF position when the meter is not in use.



AC/DC Current Measurements

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

1. Set the Function switch to the **400ADC, 40ADC, 400AAC or 40AAC** range. If the range of the measured is not known, select the higher range first then move to the lower range if necessary.
2. Press the trigger to open jaw. Fully enclose one conductor to be measured.
3. The clamp meter LCD will display the reading.

DC/AC Voltage Measurements

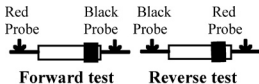
1. Insert the black test lead into the negative **COM** terminal and the red test lead into the positive **V** terminal.
2. Set the function switch to the **V** position.
3. Select AC or DC with the **MODE** button.
4. Connect the test leads in parallel to the circuit under test.
5. Read the voltage measurement on the LCD display.

Resistance and Continuity Measurements

1. Insert the black test lead into the negative COM terminal and the red test lead into the positive terminal.
2. Set the function switch to the $\rightarrow \vdash \bullet \parallel \Omega$ position.
3. Use the multifunction **MODE** button to select resistance.
4. Touch the test probe tips across the circuit or component under test. It is best to disconnect one side of the device under test so the rest of the circuit will not interfere with the resistance reading.
5. For Resistance tests, read the resistance on the LCD display.
6. For Continuity tests, if the resistance is $< 150\Omega$, a tone will sound.

Diode Measurements

1. Insert the black test lead banana plug into the negative **COM** jack and the red test lead banana plug into the positive diode jack.
2. Turn the rotary switch to the $\rightarrow \vdash \bullet \parallel$ position.
3. Press the MODE button until “ $\rightarrow \vdash$ ” appears in the display.
4. Touch the test probes to the diode under test. Forward voltage will indicate 0.4V to 0.7V. Reverse voltage will indicate “**OL**”. Shorted devices will indicate near 0mV and an open device will indicate “**OL**” in both polarities.



Capacitance Measurements

WARNING: To avoid electric shock, disconnect power to the unit under test and discharge all capacitors before taking any capacitance measurements. Remove the batteries and unplug the line cords.

1. Set the rotary function switch to the cap position.
2. Insert the black test lead banana plug into the negative (COM) jack. Insert the red test lead banana plug into the positive (V) jack.
3. Touch the test leads to the capacitor to be tested.
4. Read the capacitance value in the display.

Frequency or % duty cycle measurements

1. Set the rotary function switch to the “VDC/AC,Hz/%” position.
2. Insert the black lead banana plug into the negative COM jack and the red test lead banana plug into the positive V jack.
3. Select Hz or % duty with the **Hz/%** button.
4. Touch the test probe tips to the circuit under test.
5. Read the frequency on the display.

Temperature Measurements

WARNING: To avoid electric shock, disconnect both test probes from any source of voltage before making a temperature measurement.

1. Set the function switch to TEMP.
2. Insert the Temperature Probe into the negative (COM) and the V jacks, making sure to observe the correct polarity.
3. Select °C or °F with the MODE button.
4. Touch the Temperature Probe head to the part whose temperature you wish to measure. Keep the probe touching the part under test until the reading stabilizes (about 30 seconds).
5. Read the temperature in the display. The digital reading will indicate the proper decimal point and value.


WARNING: To avoid electric shock, be sure the thermocouple has been removed before changing to another measurement function.

Data Hold

To freeze the LCD meter reading, press the data hold button. The data hold button is located on the left side of the meter (top button). While data hold is active, the HOLD display icon appears on the LCD. Press the data hold button again to return to normal operation.

Note: The HOLD feature will activate when the Backlight is turned on. Press the HOLD key again to exit Hold.

Backlight

Press and hold the HOLD the  key for >1 second to turn on or off the display backlight function.

Note: The HOLD feature will activate when the Backlight is turned on. Press the HOLD key again to exit Hold.

Zero Button

For DCA and Capacitance Zero & Offset adjustment.

Manual Ranging

The meter turns on in the autoranging mode. Press the **Range** button to go to manual ranging. Each press of the range button will step to the next range as indicated by the units and decimal point location. Press and hold the **Range** button for two seconds to return to autoranging. Manual ranging does not function in the AC Current, Diode and Continuity check functions.

Battery Replacement

1. Remove the one rear Phillips head screw
2. Open the battery compartment
3. Replace the required two “AAA” batteries (UM4 R03)
4. Re-assemble the meter

For service on this or any other REED product, contact REED Instruments at 1-800-561-8187 or info@reedinstruments.com.