



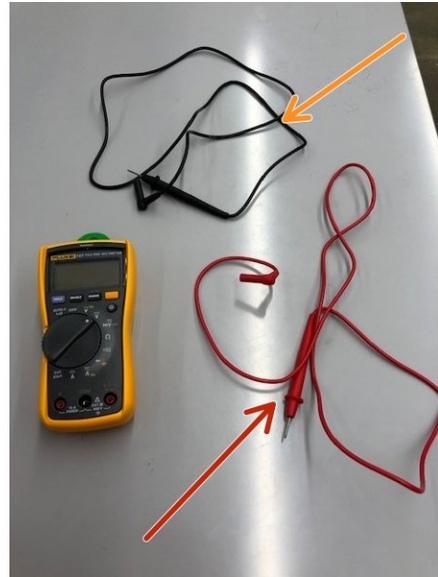
# Fluke 117 True RMS Multimeter SOP

This guide will go through all of the components and capabilities of the Fluke 117 Multimeter.

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## Step 1 — Main components



- Before we start make sure you have the main components to use the multimeter
- Positive test lead
- Negative test lead

## Step 2 — Terminal Positions



- The negative test is inserted in the black colored terminal
- To measure current, the positive test lead must be inserted in the left, red terminal
- To measure everything else, the positive test lead must be inserted in the right, red terminal

## Step 3 — Rotary Switch Positions



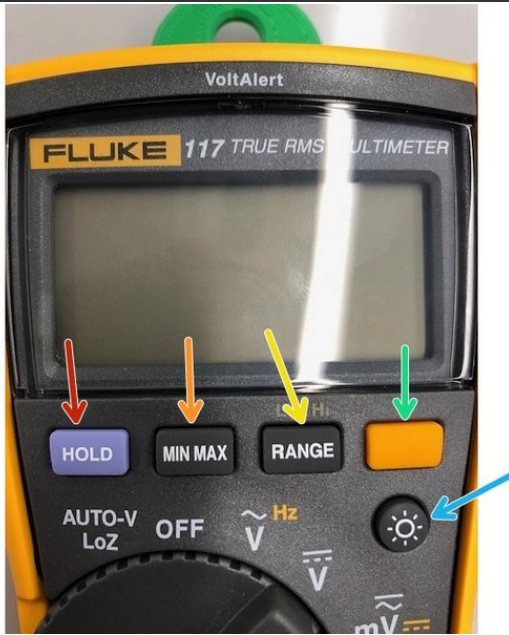
Rotary Switch Positions

Switch Position	Measurement Function	Model
AUTO-V LoZ	Automatically selects ac or dc volts based on the sensed input with a low impedance input.	114 & 117
~ Hz V (button)	AC voltage from 0.06 to 600 V. Frequency from 5 Hz to 50 kHz.	114, 115 & 117 115 & 117
V	DC voltage from .001 V to 600 V.	114, 115 & 117
mV	AC voltage from 6.0 to 600 mV, dc-coupled. DC voltage from 0.1 to 600 mV.	114, 115 & 117
Ω	Ohms from 0.1 Ω to 40 MΩ.	114, 115 & 117
	Continuity beeper turns on at < 20 Ω and turns off at >250 Ω.	114, 115 & 117
diode	Diode Test. Displays OL above 2.0 V.	115 & 117
Farads	Farads from 1 nF to 9999 μF.	115 & 117
~ A Hz (button)	AC current from 0.1 A to 10 A (>10 to 20 A, 30 seconds on, 10 minutes off). >10.00 A display flashes. >20 A, OL is displayed. DC-coupled. Frequency from 45 Hz to 5 kHz.	115 & 117
DC A	DC current from 0.001 A to 10 A (>10 to 20 A, 30 seconds on, 10 minutes off). >10.00 A display flashes. >20 A, OL is displayed.	115 & 117
Volt Alert	Non-contact sensing of ac voltage.	117

Note: All ac functions and Auto-V LoZ are true-rms. AC voltage is ac-coupled. Auto-V LoZ, AC mV and AC amps are dc-coupled.

- There are multiple positions for the rotary switch to be set. The table gives a brief summary on what each setting does

## Step 4 — Understanding the Buttons



- There are four buttons on the Fluke 117 Multimeter:
- HOLD: Turns on all display segments
- MIN MAX: Disables beeper. "bEEP" is displayed when enabled
- RANGE: Enables low impedance capacitance measurements. "LCAP" is displayed when enabled
- Orange button: Disables automatic power-down ("Sleep mode"). "PoFF" is displayed when enabled
- Brightness: disables auto backlight off. "LoFF" is displayed when enabled

## Step 5 — Measuring Resistance

### Measuring Resistance



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#### ⚠⚠ Warning

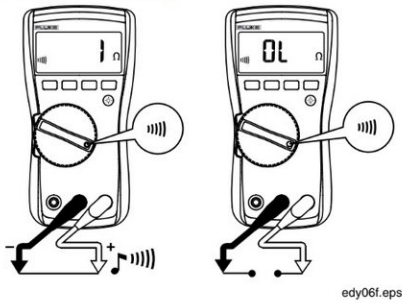
To avoid electric shock, injury, or damage to the Meter, disconnect circuit power and discharge all high-voltage capacitors before testing resistance, continuity, diodes, or capacitance.



- To measure resistance, set the knob to "Ohms" and place the leads on either side of the circuit you want to measure resistance from
- Set the Knob to the Omega symbol

## Step 6 — Measuring Continuity

### Testing for Continuity



#### Note

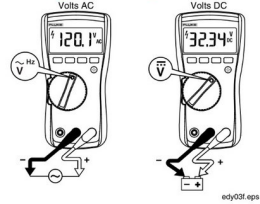
The continuity function works best as a fast, convenient method to check for opens and shorts. For maximum accuracy in making resistance measurements, use the Meter's resistance ( $\Omega$ ) function.



- To measure continuity, set the knob to the symbol that looks like waves. Place the leads on either side that you want to test for. If there is a beep then there is a continuous current, if not, then there is an opening or short in the circuit
- Set the knob to the "wave" symbol

## Step 7 — Measuring Voltage

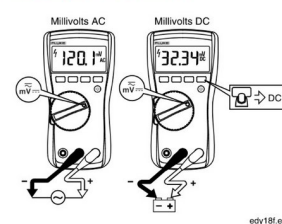
### Measuring AC and DC Voltage



**Using Auto Volts Selection (114 & 117 only)**  
With the function switch in the  $\overline{\text{V}}$  position, the Meter automatically selects a dc or ac voltage measurement based on the input applied between the V or + and COM jacks.

This function also sets the Meter's input impedance to approximately 3 k $\Omega$  to reduce the possibility of false readings due to ghost voltages.

### Measuring AC and DC Millivolts

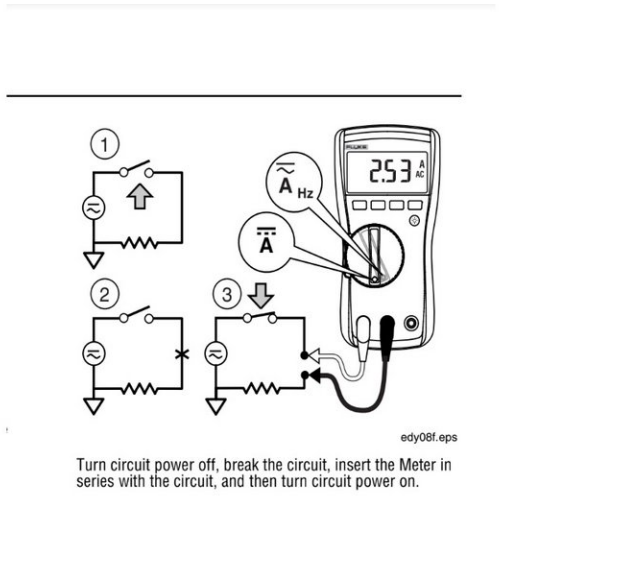


With the function switch in the  $\overline{\text{mV}}$  position, the Meter measures ac plus dc millivolts. Press  $\square$  to switch the Meter to dc millivolts.



- To measure voltage, set the knob to "V". The wave symbolizes AC and the line followed by a dashed line symbolizes DC. Set the leads on either side to measure the voltage of that portion of the circuit
- To measure millivolts, set the knob to "mV"
- AC Voltage
- DC Voltage
- AC Millivoltage. *Press yellow button for DC Millivoltage*

## Step 8 — Measuring Current



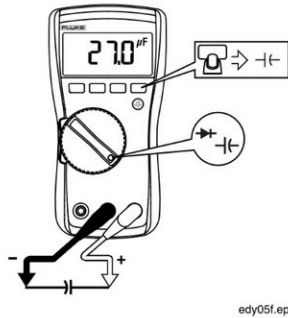
**⚠ Use the proper terminals, switch position, and range for your measurements**

- It is good practice to follow the three steps shown in the image. Set the knob to "A", and the same symbols apply for AC and DC current
- DC Current
- AC Current

## Step 9 — Measuring Capacitance

### *True-rms Multimeters* *Making Basic Measurements*

#### *Measuring Capacitance (115 & 117 only)*



- Set the knob to the symbols shown to measure capacitance
- Switching the position of the leads for other measurements will only change the sign. For capacitance it is important to have the negative lead placed on the charging side and the positive lead on the discharging side
- Press the yellow button and switch to symbol shown for capacitance

## Step 10 — Measuring Frequency

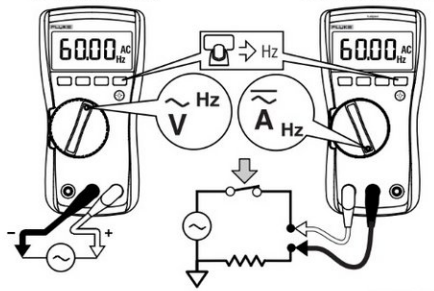
### Measuring Frequency (115 & 117 only)

#### ⚠⚠ Warning

To avoid electrical shock, disregard the bar graph for frequencies >1 kHz. If the frequency of the measured signal is >1 kHz, the bar graph and  $\sim$  are unspecified.

AC Voltage Frequency

AC Current Frequency




The Meter measures the frequency of a signal by counting the number of times the signal crosses a trigger level each second. The trigger level is 0 V, 0 A for all ranges.

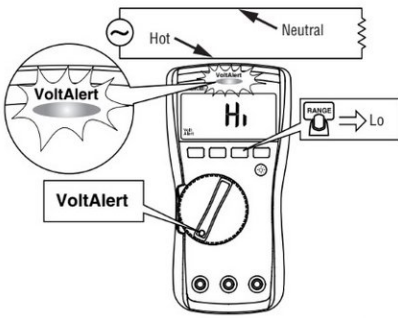


- To measure voltage frequency, set the knob to "V (AC)" you will also see the "Hz" symbol
- To measure current frequency, set the knob to "A (AC)" you will also see the "Hz" symbol
- Press yellow button and switch to the AC Voltage position
- Press yellow button and switch to AC Current position

## Step 11 — Detecting AC Voltage

Press  to turn the frequency measurement function on and off. Frequency works with ac functions only. In frequency, the bar graph and range annunciator indicate the ac voltage or current present. Select progressively lower ranges using manual ranging for a stable reading.

### Detecting AC Voltage Presence (117 only)



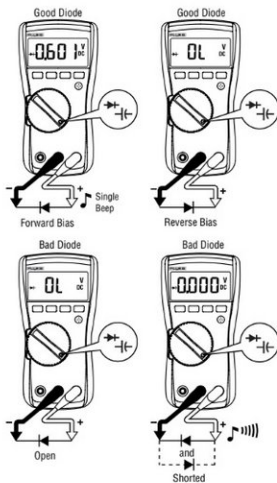
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- To detect the presence of AC voltage, place the top of the meter close to a conductor. The meter gives an audible as well as visual indication when voltage is detected
- There are two sensitivity settings. The "Lo" setting used for various power cords, and the "Hi" setting which allows for AC voltage detection on other styles of recessed power connectors or sockets where the actual AC voltage is recessed within the connector itself
- Switch to the Volt Alert position

## Step 12 — Testing Diodes

Testing Diodes (115 & 117)



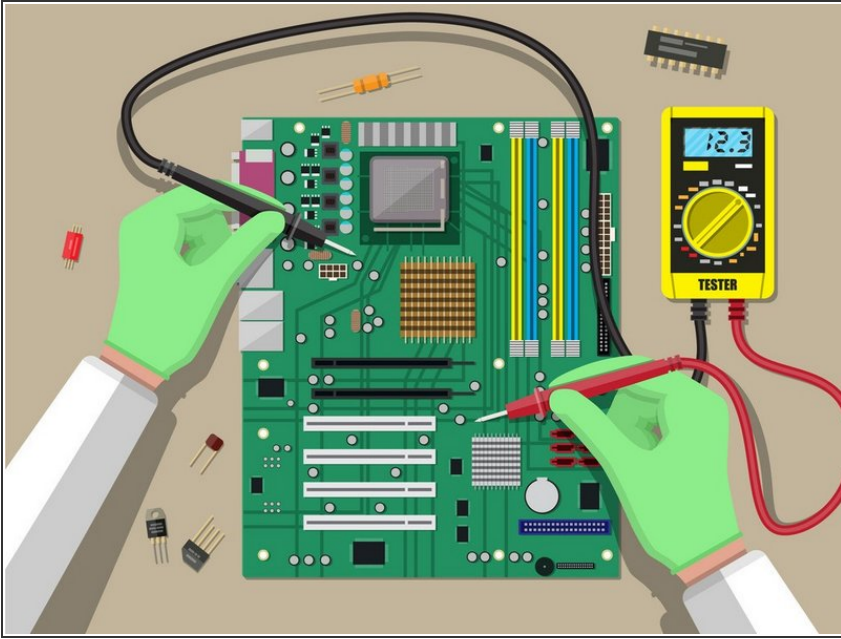
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- To measure diodes, set the knob to the symbols shown in the image
- As seen in the image, a good diode will give an audible signal when measuring a forward bias diode and no signal with OL for a reverse bias diode.
- A bad diode will give no signal for a forward bias, and a long auditory signal for an open and shorted diode
- Set knob to the diode symbol. *DO NOT PRESS YELLOW BUTTON*

## Step 13 — Finished!

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- The guide is finished! If you have any questions do not hesitate to ask Terrapin Works staff before performing measurement
- Images and guides were taken and edited from the Official Fluke 117 Multimeter Manual:  
<https://www.allaboutcircuits.com/test-me...>