



Figure 1. The Photo of Actual 317



Figure 2. The Photo of Actual 319



Figure 3. The Photo of Actual 319

#### FEATURES

Digital Display: 6000 count resolution

Low Battery Indication: Display  when the batteries are below their required voltage

Power Source: Three AAA IEC LR03 batteries

Clamp Opening Size: 1.45"

Jaw Diameter: 1.45"

Dimension (L×W×H): 6.39"×2.29"×1.20"

Auto Range: Available in Ohms

Safety: CE

EN/IEC 61010-1 and IEC 61010-2-032

Measurement Category: 600 V CAT III

Weight: About 384g

#### APPLICATIONS

It's widely used to measure alternating voltage, direct voltage, current, capacitance, diode, audion, resistance, temperature, frequency, etc.

#### DESCRIPTION

The 317 and 319 are hand-held and battery-operated clamp meters that can measure AC current, DC current, AC voltage, DC voltage, resistance, continuity and frequency.

The clamp meter is battery powered with a digital display.

Except where noted, the descriptions and instructions in this datasheet apply to both the 317 and 319 clamp meters.

**⚠⚠ Warning: To avoid possible electric shock or personal injury, read "Safety Information" before using the clamp meter.**

#### SAFETY INFORMATION

Use the clamp meter only as specified in this datasheet, otherwise the protection provided by the clamp meter may be impaired.

Adhere to local and national safety codes. Individual protective equipment must be used to prevent shock and arc blast injury where hazardous live conductors are exposed.

Use extreme caution when working around bare conductors or bus bars. Contact with the conductor could result in electric shock.

Use caution when working with voltages above 30V AC rms, 42V AC peak, or 60V DC. These voltages pose a shock hazard.

Never measure current while the test leads are inserted into the input jacks.

Do not use the clamp meter in wet, dirty or hazardous



environment.

Do not use the clamp meter or test leads if either appears damaged. Inspect the clamp meter and test leads before using. Look for cracks or missing plastic. Pay attention to the insulation around the connectors. Do not use if insulation is damaged or metal is exposed.

Check the test leads for continuity. Do not use the clamp meter if test leads read open.

When using probes, keep fingers behind the finger guards.

Do not hold the clamp meter anywhere above the tactile barrier. See figure 5.

Disconnect circuit power and discharge all high-voltage capacitors before testing resistance, continuity, or diodes.

Check clamp meter operation on a known source before and after use.

Use the proper terminals, function, and range for your

measurements.

Do not apply more than the rated voltage, as marked on clamp meter, between any terminal and earth ground.

Before opening back cover to replace batteries, remove test leads and disconnect clamp meter from any circuits being measured. Do not operate clamp meter with cover removed or the case open.

To avoid false readings that can lead to electrical shock or injury, replace the batteries as soon as the low-battery indicator (⚡) appears. The clamp meter will shut down when the batteries get low.

Have the clamp meter serviced only by qualified service personnel.

Do not use the current sensor if the wear indicator in the jaw opening is not visible. See figure 4.

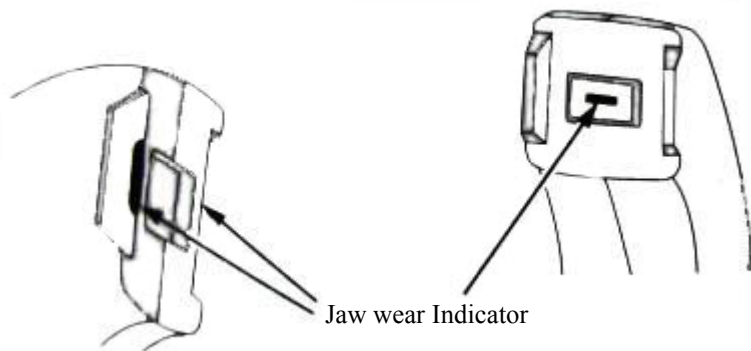


Figure 4. Jaw Wear Indicators

Table 1. Symbols

	Risk of danger. Important information. Refer to operation instructions.
	Hazardous voltage. Risk of electric shock.
	Application and removal from hazardous live conductors permitted.
	Double insulated
	Battery
	Earth ground
	Volts AC



	Volts DC
	Conforms to applicable European directives.
CAT III	For measurements performed in the building installations such as distribution panels, feeders and short branch circuits and lighting systems in large buildings.
	Do not dispose of this product as unsorted municipal waste.

**GENERAL SPECIFICATIONS**

Table 2. Electrical Specifications

The accuracy specification is defined as  $\pm$  (% reading+digits) at 23°C $\pm$ 5°C.

Function	Parameter	317	319	
 (A ac)	Range	40.00A 600.0A	40.00A 600.0A 1000A	
	Resolution	0.01A 0.1A	0.01A 0.1A 1A	
	Accuracy		1.6% $\pm$ 6digit (50-60Hz) [40A]	1.6% $\pm$ 6digit (50-60Hz) [40A]
			2.5 $\pm$ 8digit (60-500Hz) [40A]	2.5 $\pm$ 8digit (60-500Hz) [40A]
			1.5% $\pm$ 5digit (50-60Hz) [600A]	1.5% $\pm$ 5digit (50-60Hz) [600A/1000A]
		2.5 $\pm$ 5digit (60-500Hz) [600A]	2.5 $\pm$ 5digit (60-500Hz) [600A/1000A]	
Crest factor add 2% into spec for CF>2	3.0Max@500A 2.5Max@600A	3.0Max@500A 2.5Max@600A 1.4Max@1000A		
AC response	rms	rms		
 (A dc)	Range	40.00A 600.0A	40.00A 600.0A 1000A	
	Resolution	0.01A 0.1A	0.01A 0.1A 1A	
	Accuracy	1.6% $\pm$ 6digit [40A] 1.5% $\pm$ 5digit [600A]	1.6% $\pm$ 6digit [40A] 1.5% $\pm$ 5digit [600A/1000A]	
	Range	600.0V		





(V ac)	Resolution	0.1V	
	Accuracy	1.5%±5 digit (20-500Hz)	
	AC response	rms	
 (V dc)	Range	600.0V	
	Resolution	0.1V	
	Accuracy	1%±4 digit	
$\Omega$	Range	400.0 $\Omega$ 4000 $\Omega$	
	Resolution	0.1 $\Omega$ 1 $\Omega$	
	Accuracy	1%±5 digit	
		≤ 30 $\Omega$	
Inrush	Integration time	N/A	100ms
Hz	Range	N/A	5.0-500.0Hz
	Accuracy	N/A	0.5%±5 digit
	Trigger Level	N/A	10-100Hz ≥5 A, 5-10Hz, 100-500Hz ≥10A
The accuracy specifications apply at 73°F ±41°F (23°C ±5°C) Below 64°F and above 82°F (18°C and above 28°C) accuracy degrades at (0.1) times specification per °C. True rms for ac V and ac A accuracy is specified from 5% to 100% of range.			

Table 3. Environmental Specifications

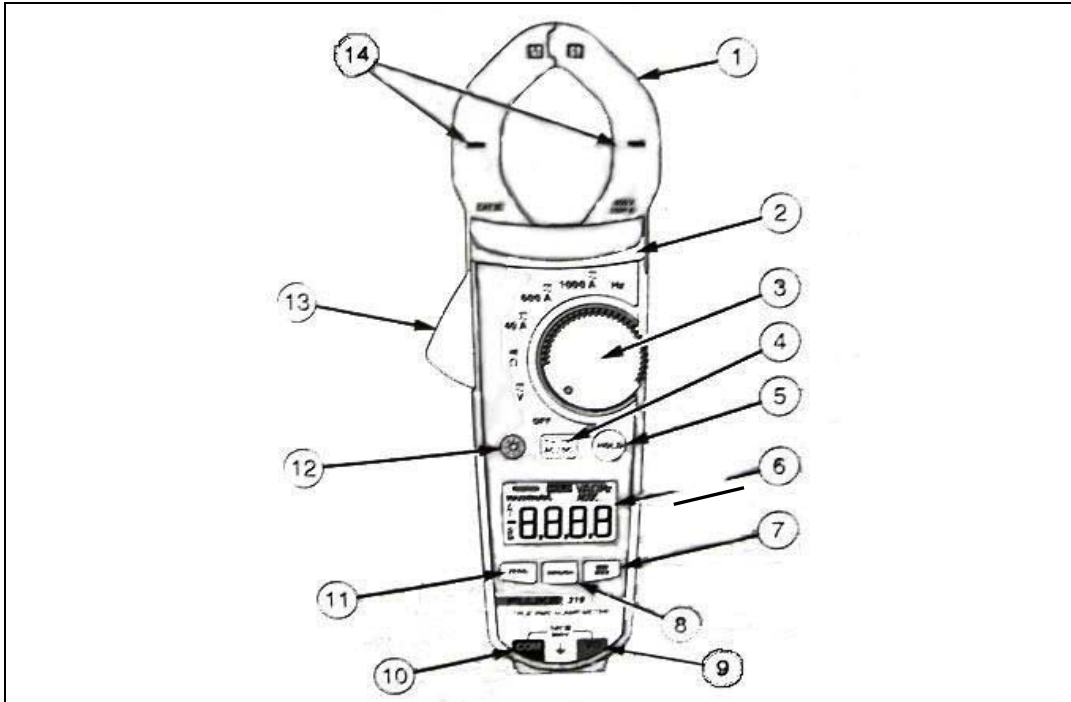
Operating Temperature	14°F to 122°F (-10°C to 50°C)
Storage Temperature	-40°F to 140°F (-40°C to 60°C)
Operating Humidity	Non condensing (<50°F) (<10°C) 90% RH (50°F to 86°F) (10°C to 30°C) 75% RH (86°F to 104°F) (30°C to 40°C) 45% RH (104°F to 122°F) (40°C to 50°C)
Without Condensation	
Operating Altitude	1 mile (2000 meters) above mean sea level
Storage Altitude	7 miles (12,000 meters) above mean sea level
IP Rating	IP40
Vibration Requirements	Random MIL-PRF-28800F Class 2, 5-500HZ, 30 minutes per axis
Drop Test Requirements	3 ft (1m) drop test, six sides, oak floor
EMI, RFI, EMC	Instrument unspecified for use in EMC field ≥0.1V/m




Temperature Coefficients	0.1× (specified accuracy)/°C (<64°F or >82°F) (<18°C or >28°C)
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### METER FUNCTION

Table 4.



①	Current sensing clamp
②	Tactile barrier <b>⚠⚠Warning: To avoid injury, do not hold the clamp meter anywhere above the tactile barrier.</b>
③	Rotary function switch
④	Select AC or DC
⑤	Hold button: freeze the display reading and releases the reading when pressed a second time.
⑥	LCD
⑦	Min Max button: when first pressed, the clamp meter shows maximum input. With subsequent presses, the minimum and the average inputs are shown. Hold  for 2 seconds to exit min max mode. This function works in current, voltage and Hz modes.
⑧	Inrush button (319 only): press this button to enter inrush mode. Press it a second time to exit. Integration time is 100ms.
⑨	Volts/Ohm input terminal
⑩	Common terminal
⑪	Zero button: zero the display for DC measurement.
⑫	Backlight button: turn the backlight on and off. The Backlight stays on for 2 minutes when there is no button or switch interaction and then shuts off.



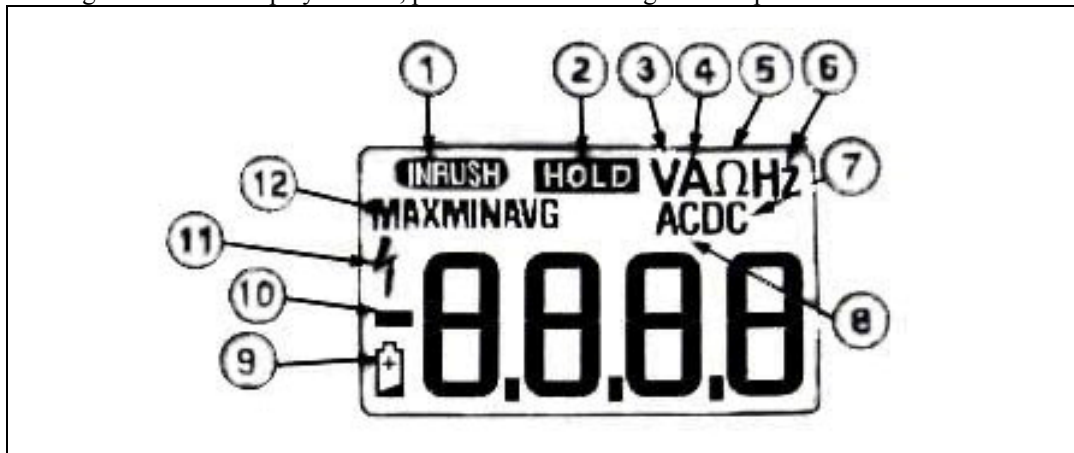
⑬	Jaw release
⑭	Alignment marks: to meet accuracy specifications the conductor must be aligned with the marks.

Table 5. Rotary Switch

Switch Position	Function
OFF	Clamp meter is powered down
	DC and AC voltage
	Resistance and continuity
40	40A current range
600	600A current range
1000	1000A current range (319 only)
Hz	Frequency (319 only)

Table 6. Display

To see all segments on the display at once, press while turning the clamp meter on.



①	Inrush is active (319 only)	⑦	DC mode
②	Hold is active	⑧	AC mode
③	Volts	⑨	Batteries are low and must be changed
④	Amps	⑩	Negative reading
⑤	Ohms	⑪	High voltage indicator
⑥	Hertz (319 only)	⑫	MAX-Maximum reading displayed MIN-Minimum reading displayed AVG-Average reading is displayed

**TAKING MEASUREMENTS**

**⚠⚠Warning**

To avoid electric shock or personal injury:



When making current measurements, disconnect the test leads from the clamp meter.

Keep fingers behind Tactile Barrier. See table 4.

Note


When measuring current, center the conductor in the clamp using the alignment marks on the clamp. See table 4.

**Zero**

Before taking DC measurements, zero the clamp meter to ensure correct readings. Zeroing the clamp meter removes DC offset (ambient noise) from the reading.



Note

Before zeroing the clamp meter, make sure the jaws are closed and there is no conductor between them.

To zero the clamp meter, press .

### MEASURING AC OR DC CURRENT

To measure AC or DC current:

1. Turn the rotary function switch to the proper current range.
2. Press  to select DC current if necessary. The default is AC current.
3. If measuring DC, wait for the display to stabilize and then press  to zero the clamp meter.

Note: Before zeroing the clamp meter, make sure the jaws are closed and there is no conductor between them.

4. Open the clamp by pressing the jaw release and insert the conductor to be measured into the clamp.
5. Close the clamp and center the conductor using the jaw alignment marks.
6. View the reading on the LCD.

**⚠⚠Warning:** To avoid possible electric shock or personal injury, currents moving in opposite directions cancel each other. Place only ONE conductor into the clamp at a time, see figure 5.

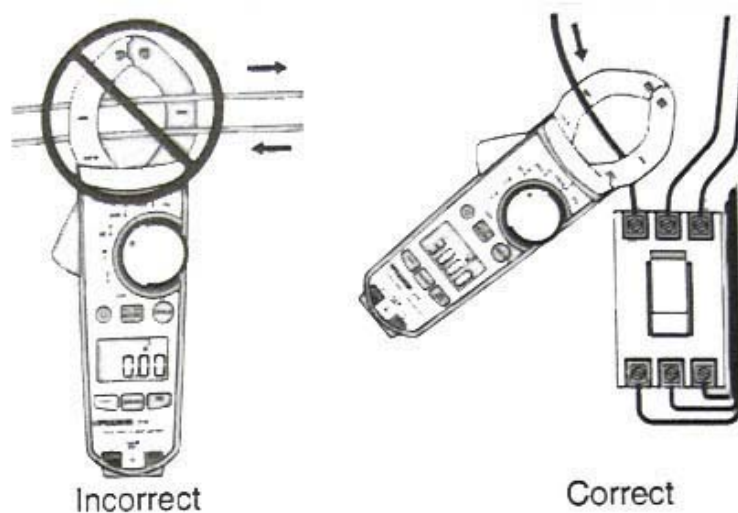


Figure 5. Connecting the Clamp Meter

### MEASURING AC AND DC VOLTAGE

**⚠⚠Warning**

To avoid electric shock or personal injury:



When making electrical connectors, connect the common test lead before connecting the live test lead; when disconnecting, disconnect the live test lead before disconnecting the common test lead.

When using test probes, keep fingers behind the finger guards.

To measure AC or DC voltage:

1. Turn the rotary function switch to  $\text{V}$ .
2. If measuring DC voltage, press  $\text{AC/DC}$  to shift to DC voltage. The default is AC voltage.
3. Connect the black test lead to the **COM** terminal and the red test lead to the  $\text{V}\Omega$  terminal.
4. Measure the voltage by touching the probes to the desired test points of circuit. See figure 6 and 7.
5. See the reading on the LCD.



Figure 6. AC Voltage Measurement

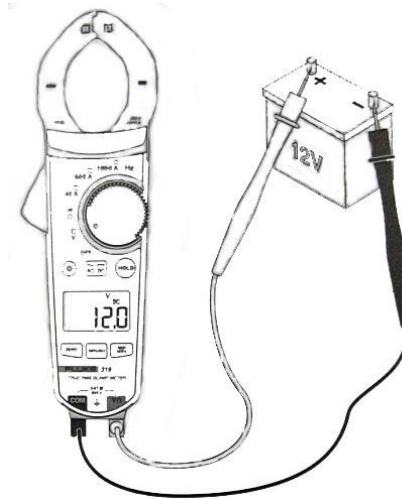


Figure 7. DC Voltage Measurement

## MEASURING RESISTANCE

### ⚠⚠ Warning

To avoid possible electric shock or personal injury, when measuring resistance in a circuit, make sure the power to the circuit is turned off and all capacitors are discharged.

To measure resistance:

1. Turn the rotary function switch to  $\Omega$ .
2. Remove power from the circuit being tested.
3. Connect the black test lead to the **COM** terminal and the red test lead to the  $\text{V}\Omega$  terminal.
4. Measure the resistance by touching the probes to the desired test points of the circuit. See figure 8.
5. See the reading on the LCD.





Figure 8. Measuring Resistance

**TESTING CONTINUITY**

**⚠⚠Warning**

To avoid electrical shock when testing continuity in a circuit, make sure the power to the circuit is turned off and all capacitors are discharged.

To test continuity:

1. Remove power from the circuit being tested.
2. Turn the rotary function switch to  $\Omega$ .
3. Connect the black test lead to the **COM** terminal and the red test lead to the **V $\Omega$**  terminal.
4. Connect the probes across the circuit or component to be tested. See figure 9.
5. If the resistance is  $<30\Omega$ , the beeper sounds continuously denoting continuity. If the display reads **OL**, the circuit is open.

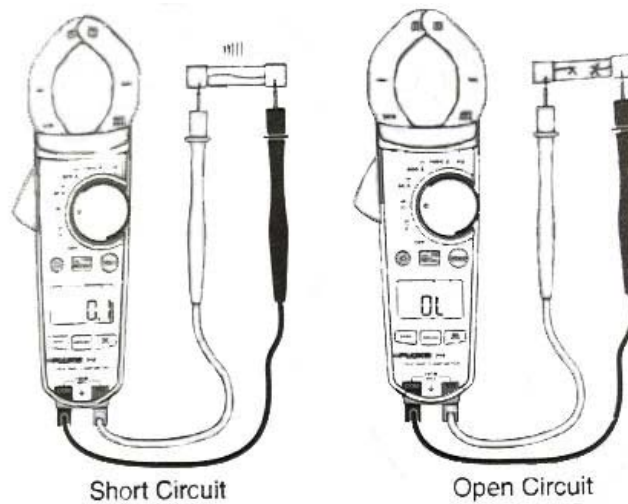


Figure 9. Measuring Continuity

**⚠⚠Warning**

To avoid electrical shock or personal injury, do not touch the terminals while measuring. Dangerous voltages can be present at the input terminals but not displayed.



#### MEASURING CURRENT FREQUENCY (319 ONLY)

To measure current frequency:

1. Turn the rotary switch to Hz.
2. Open the clamp by pressing the jaw release and insert the conductor to be measured into the clamp.
3. Close the clamp and center the conductor using the jaw alignment marks.
4. See the reading on the LCD.

The frequency reading appears on the display.

#### HOLD

To capture and hold the present reading, press **HOLD** while taking a reading. Press **HOLD** again to return to the live reading. High voltage will be designated by ⚡.

#### MIN MAX AVG

To use the Min Max Avg functions:

1. Press **MIN MAX** once to set the clamp meter to MAX (maximum) mode.
2. Press **MIN MAX** again to set the clamp meter to MIN (minimum) mode.
3. Press **MIN MAX** a third time and the clamp meter displays an AVG (average) of the readings.
4. Pressing **MIN MAX** for more than 2 seconds sets the clamp meter back to normal operation.
5. Press **HOLD** in MIN MAX AVG mode to freeze the realtime record. In this mode, press **MIN MAX** to select a recorded value to view.

#### INRUSH CURRENT (319 ONLY)

To measure inrush current (see figure 10.)

1. Place the source wire into the clamp. Make sure the wire is below the alignment marks on the clamp.
2. With the source power off, turn the clamp meter to the correct range of **A**.
3. Press **INRUSH**.
4. Switch the source power on and note the inrush current reading on the display.

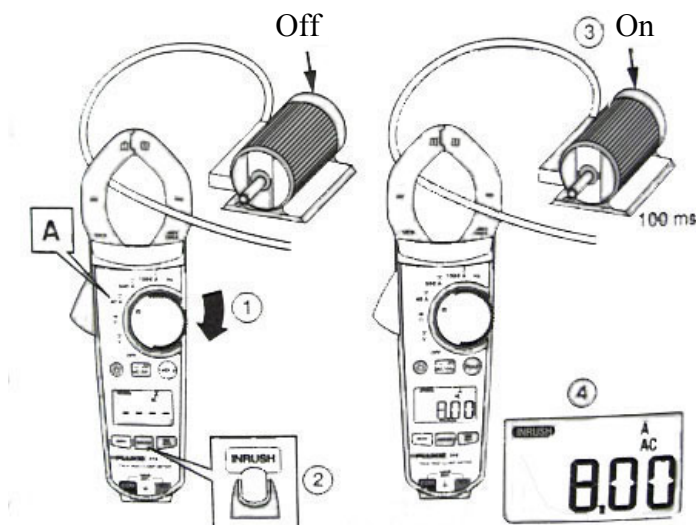



Figure 10. Measuring Inrush Current



#### AUTO POWER OFF

The clamp meter turns off if there is no button pushed or rotary function switch operation for 20 minutes. Turn the clamp meter off and on to restart the clamp meter. This feature is disabled in MIN, MAX and HOLD modes; it can also be disabled for all modes by holding  while turning the clamp meter on.

#### MAINTENANCE

##### Warning

**To avoid electrical shock, or personal injury:**

**Repairs or servicing not covered in this datasheet should be performed only by qualified personnel.**


**Disconnect test leads from the clamp meter before removing its back cover.**

**Never use the clamp meter with back cover removed.**

##### Caution

**If the clamp meter is not going to be used for an extended time, remove the batteries. Do not store the clamp meter in high temperature or high humidity environments.**

#### CHANGING BATTERIES

When battery voltage drops below the value required for proper operation, the battery symbol  appears. Although the clamp meter continues to work correctly, the batteries should be replaced as soon as possible. As the battery voltage drops below the low limit, the clamp meter will shut down.

To change batteries:

1. Turn the clamp meter off and disconnect the test leads.
2. Using a screwdriver, open the battery cover on the bottom of the clamp meter.
3. Replace the batteries with three new AAA IEC LR03 batteries.
4. Close the back cover and tighten the screw.

#### CLEANING THE CLAMP METER

##### Caution

**To avoid damaging the clamp meter, do not use abrasives or solvents on this instrument.**

**Periodically clean the clamp meter by wiping it with a damp cloth, mild soap may be used.**

#### ORDERING INFORMATION

Table 7. Unit Price

Part#	Unit Price
317	\$166.07
319	\$211.19

#### NOTICE

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