

#### IMPORTANT: RECEIVING INSTRUCTIONS

Visually inspect all components for shipping damage. If you find damage, notify the carrier at once.

Shipping damage is NOT covered by warranty. The carrier is responsible for all repair or replacement costs resulting from damage in shipment.

Read this owners manual thoroughly before use and save.

#### I. DISPLAY SYMBOLS (See Figure 2)

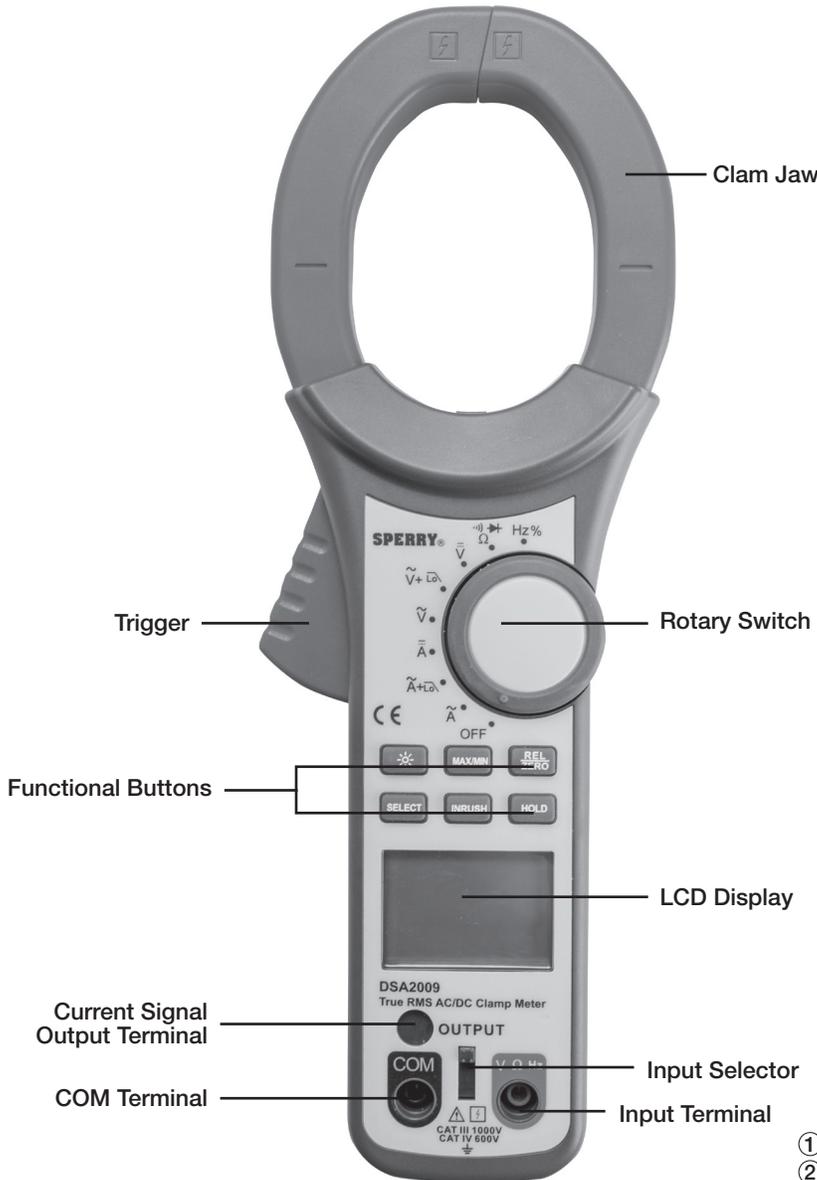


Figure 1

1	Low Battery
2	Manual Range
3	Auto Range
4	DC
5	Negative Polarity
6	AC
7	True RMS
8	Low Pass Filter
9	DC Current # Clearing
10	Simulation Bar & Graduated Scale
11	Inrush
12	Voltage (Volt, millivolt)
13	Current (Amp)
14	Frequency (Hertz)
15	Resistance ( $\Omega$ , k $\Omega$ , M $\Omega$ )
16	Capacitance (nF, uF, mF)
17	Diode
18	Continuity
19	Duty Ratio
20	Data Hold
21	Slave Display
22	Relative Value
23	Minimum Value
24	Maximum Value
25	Auto Shutdown

	Dual insulation		Diode
	Grounding		Low battery
	Warning prompt		AC or DC (Alternating current or direct current)
	AC (Alternating current)		Danger! High voltage!
	DC (Direct current)		Comply with EU standard
	Continuity Test		

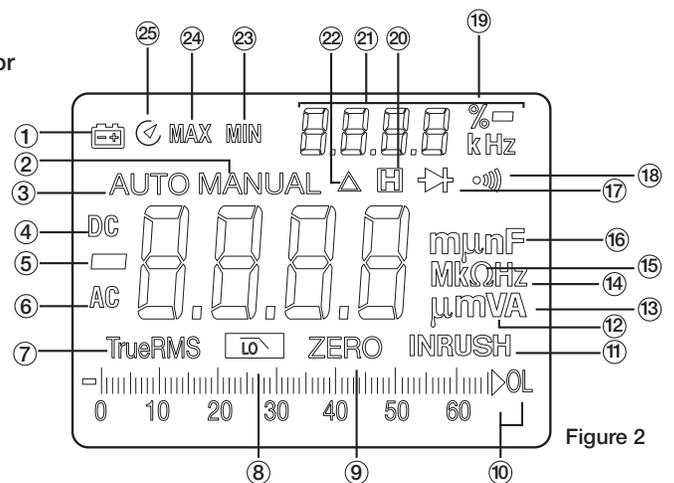


Figure 2

## II. FEATURES AND MEASUREMENT FUNCTIONS

- Precise True RMS circuitry
- 5999 Count Backlit Screen
- Data hold capability to maintain reading on display
- Auto power off functionality to save battery life
- Output test feature for an oscilloscope
- AC/DC Current
- AC/DC Voltage
- Resistance
- Continuity
- Diode Test
- Frequency
- Duty Cycle
- InRush Current
- Relative Measurement
- Low Pass Filtering

### Validity of keys

		SELECT	MAX/MIN	HOLD	INRUSH	REL	ZERO
$\bar{A}$		x					x
$\bar{A}+LO\backslash$		x					x
$\bar{A}$		x			x	x	✓
$\bar{V}$		x			x		x
$\bar{V}+LO\backslash$		x			x		x
$\bar{V}$		x			x		x
$\Omega$					x		x
					x		x
					x		x
Hz	✓	x	x	✓	x	x	x

Not all the key operations at a gear are valid. The corresponding operation function can be selected or instrument under sleepstate be awakened only by valid key operations, as shown.

## III. SAFETY WARNINGS

- This instruction manual contains warnings and safety rules which must be observed by the user to ensure safe operation of the instrument and retain it in safe condition.
- Read through and understand the instructions contained in this manual before using the instrument.
- Keep the manual at hand to enable quick reference whenever necessary.
- The instrument is to be used only in its intended applications.
- Understand and follow all the safety instructions contained in the manual.
- It is essential that all safety instructions are adhered to.
- Failure to follow the safety instructions may cause injury, instrument damage

The symbol  indicated on the instrument means that the user must refer to the related parts in the manual for safe operation of the instrument. It is essential to read the instructions wherever the symbol appears in the 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 can cause serious or fatal injury.
  -  **CAUTION** is reserved for conditions and actions that can cause injury or instrument damage.

## ⚠ DANGER

- Never make measurement on a circuit in which voltage over 600V exists.
- Do not exceed the CAT rating of the measuring device
- Do not attempt to make measurement in the presence of flammable gases.  
The use of the instrument may cause sparking, which can lead to an explosion.
- Transformer jaw tips are designed to not short the circuit during a test. If equipment under test has exposed conductive parts extra precaution should be taken to minimize the possibility of shorting.
- Never use the instrument if its surface or your hand is wet.
- Do not exceed the maximum allowable input of any measuring range.
- Never open the battery cover during a measurement.
- The instrument is to be used only in its intended applications or conditions.  
Use in other than as intended may cause instrument damage or serious personal injury.

## ⚠ WARNING

- Never attempt to make any measurement if any abnormal conditions are noted, such as broken case, cracked test leads and exposed metal part.
- Do not turn the function selector switch with plugged in test leads connected to the circuit under test.
- Do not install substitute parts or make any modification to the instrument.  
Return the instrument to your distributor for repair or recalibration.
- Do not try to replace the batteries if the surface of the instrument is wet.
- Always switch off the instrument before opening the battery compartment cover for battery replacement.

## ⚠ CAUTION

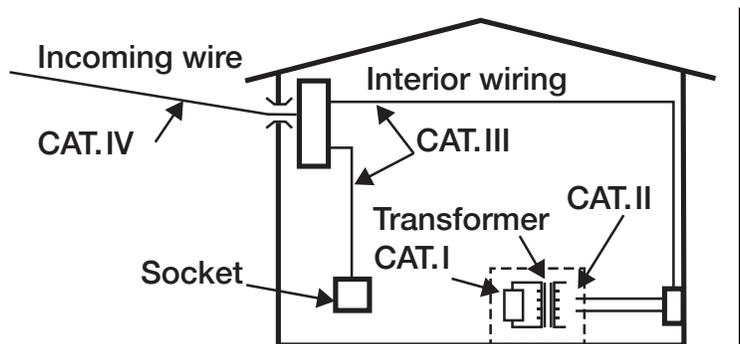
- Set the Function Switch to an appropriate position before starting measurement.
- Firmly insert the test leads.
- Disconnect the test leads from the instrument for current measurement.
- Do not expose the instrument to the direct sun, high temperature and humidity or dewfall.
- Be sure to power off the instrument after use. When the instrument will not be in use for a long period, place it in storage after removing the batteries.
- Use only a soft cloth dampened with water or neutral detergent for cleaning the meter.  
Do not use abrasives, solvents or harsh chemicals. Allow to dry thoroughly before use.

### Measurement categories (Over-voltage categories)

To ensure safe operation of measuring instruments, IEC61010 establishes safety standards for various electrical environments, specified as CAT I through CAT IV, and called measurement categories. Higher-numbered categories correspond to electrical environments with greater momentary energy, so a measuring instrument designed for CAT III environments can endure greater momentary energy than one designed for CAT II.

- CAT I: Secondary electrical circuits connected to an AC electrical outlet through a transformer or similar device.
- CAT II: Primary electrical circuits of equipment connected to an AC electrical outlet by a power cord.
- CAT III: Primary electrical circuits of the equipment connected directly to the distribution panel, and feeders from the distribution panel to outlets.
- CAT IV: The circuit from the service drop to the service entrance, and to the power meter and primary over current protection device (distribution panel).

Symbols	
⚠	Important Information; Refer to manual
CE	Conformité Européene ("European Conformity")
	Designates the product as recyclable electronic waste per WEEE Directive
	Double Insulated
	AC (Alternating Current)
	AC/DC Selectable (Alternating Current/Direct Current)
	Earth Ground



#### IV. GENERAL SPECIFICATION

Display	5999 count Backlit LCD
Altitude	Maximum 2000m
Sampling Rate	~ 3 times / sec
Auto Shutdown	15 Minutes (Unless disabled)
Battery Type	9V alkaline battery
Operating Temperature	0°C~30°C(not > 80%RH), 30°C~40°C (not > 5%RH), 40°C~50°C(not > 45%RH)
Storage Temperature	-20°C~+60°C (not > 80%RH)
Size	Dimension: 298mm×107mm×47mm;
Weight	726g (inclusive of battery)
Compliance	IEC61010-1 / IEC61010-2-032 / CATIII1000V / CATIV600V

#### V. TECHNICAL SPECIFICATION

Accuracy:	± (%+ word number), one-year calibration time
Ambient temperature:	23°C±5°C
Ambient humidity:	≤80% RH
Temperature coefficient:	0.1×(accuracy) /°C

(1) DC voltage  $\bar{V}$

RANGE	RESOLUTION	ACCURACY	OVERLOAD PROTECTION
6.600V	0.001V	±(0.8%+3)	1000V DC/AC
66.00V	0.01V	±(0.8%+1)	
660.0V	0.1V		
1000V	1V	±(1.0%+3)	

Input impedance ≥ 10MΩ

(2) AC voltage  $\tilde{V}$

RANGE	RESOLUTION	ACCURACY	OVERLOAD PROTECTION
6.600V	0.001V	±(1.2%+5)	1000V DC/AC
66.00V	0.01V		
660.0V	0.1V		
1000V	1V	±(1.5%+5)	

Main display: true RMS voltage

Main display: frequency

Input impedance ≥ 10MΩ

Frequency response: 40~400Hz(≤400mV 50~100Hz)

(3) Resistance  $\Omega$

RANGE	RESOLUTION	ACCURACY	OVERLOAD PROTECTION
660.0Ω	0.1Ω	±(1.2%+2)	1000V DC/AC
6.600kΩ	0.001kΩ	±(1.0%+2)	
66.00kΩ	0.01kΩ		
660.0kΩ	0.1kΩ		
6.600MΩ	0.001MΩ	±(1.2%+2)	
66.00MΩ	0.01MΩ	±(1.5%+2)	

(4) Continuity test 

RANGE	RESOLUTION	ACCURACY	OVERLOAD PROTECTION
	0.1Ω	buzzer will sound when $\leq 30\Omega$	1000V DC/AC
		Open-circuit voltage is about 1.2V	

(5) Diode test 

RANGE	RESOLUTION	ACCURACY	OVERLOAD PROTECTION
	0.001V	0.5V~0.8V	1000V DC/AC
		Open-circuit voltage is about 3.3V	

(6) Frequency Hz

RANGE	RESOLUTION	ACCURACY	OVERLOAD PROTECTION
66.00Hz	0.01Hz	$\pm(0.1\%+3)$	1000V DC/AC
660.0Hz	0.1Hz		
6.600kHz	0.001kHz		
66.00kHz	0.01kHz		
660.0kHz	0.1kHz		
6.600MHz	0.001MHz		
20.00MHz	0.01MHz		

Main display: frequency value  
Slave display: duty ratio

Sensitivity: When  $\leq 100\text{kHz}$ ,  $\geq 300\text{mV rms}$   
When  $100\text{kHz}$ ,  $\geq 600\text{mV rms}$   
Input range a:  $300\text{mV} \leq a \leq 30\text{V rms}$

(7) DC current  $\bar{A}$

RANGE	RESOLUTION	ACCURACY	OVERLOAD PROTECTION
660.0A	0.1A	$\pm(2.5\%+5)$	2500A
2000A	1A		

(8) AC current  $\bar{A}$

RANGE	RESOLUTION	ACCURACY	OVERLOAD PROTECTION
660.0A	0.1A	$\pm(2.5\%+5)$	2500A
2000A	1A		

Main display: true RMS current  
Main display: frequency  
Frequency response: 50Hz~60Hz

## VI. MEASUREMENT

### 1. DC VOLTAGE MEASUREMENT (See Figure 3)

- (1) Insert test leads - Insert the black test lead into the **COM** input and the red test lead into the  $\bar{V}$  input.
- (2) Set  $\bar{V}$  function - Turn the dial to the  $\bar{V}$  function.
- (3) Test & Measure - Place the red and black test leads at the positive and negative points to be measured, the clamp meter will automatically select the proper range, and the display will show the DC voltage value being measured. If the potential at the red test leads is higher than the potential at the black test leads, the display will either show a positive voltage value or a negative voltage value.

 **WARNING** DC voltage measurement should not exceed 1000V DC!

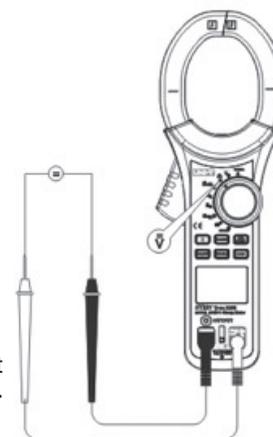


Figure 3

## 2. AC VOLTAGE MEASUREMENT $\tilde{V}$ (See Figure 4)

- (1) **Insert test leads** - Insert the black test lead into the **COM** input and the red test lead into the  $\tilde{V}$  input.
- (2) **Set  $\tilde{V}$  function** - Turn the dial to the  $\tilde{V}$  function.
- (3) **Test & Measure** - Place the red and black test leads at both the positive and negative points to be measured. The clamp meter will automatically select the proper range and the display will show the True RMS value of the measurement being taken while the slave display shows the frequency value of the AC voltage.

Note: When measuring AC voltage below 500Hz, set the dial to the  $\tilde{V} + \overline{\Delta}$ . This is the low pass filter, it will filter high-frequency interference caused by frequencies above 7.5KHz to ensure a stable reading.

**⚠ WARNING** AC voltage measurement should not exceed 750V AC!

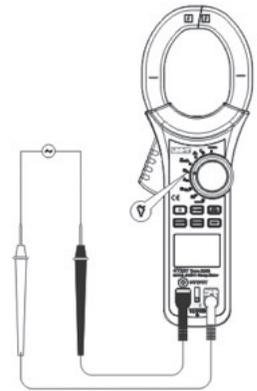


Figure 4

## 3. RESISTANCE MEASUREMENT $\Omega$ (See Figure 5)

- (1) **Insert test leads** - Insert the black test lead into the **COM** input and the red test lead into the  $\Omega$  input.
- (2) **Set  $\Omega$  function** - Turn the dial to the  $\Omega$  function.
- (3) **Select Function** - There are a total of 3 functions that are accessible by pressing the **SELECT** key. The Ohms function is the default option.
- (4) **Test & Measure** - Place the red and black test leads at both the positive and negative points to be measured. The clamp meter will automatically select the proper range and the display will show the resistance value of the measurement being taken on the display. When the test leads are not connected or the resistance value is too great, the display will show an over-range symbol "**OL**".

**⚠ WARNING** When measuring resistance, the circuit should be powered off and all capacitors should be completely discharged prior to testing. A more accurate measurement can be achieved by separating the component from the circuit being tested.

## 4. DIODE MEASUREMENT $\rightarrow+$ (See Figure 6)

- (1) **Insert test leads** - Insert the black test lead into the **COM** input and the red test lead into the " $\Omega$ " input.
- (2) **Set  $\Omega$  function** - Turn the dial to the  $\Omega$  function.
- (3) **Selection Function** - There are a total of 3 functions that are accessible by pressing the **SELECT** key. Press the **SELECT** key until the  $\rightarrow+$  appears on the display.
- (4) **Test & Measure** - For forward voltage drop readings on any semiconductor component, place the red test lead on the components anode and place the black test lead on the components cathode. When the test leads are not connected or are reversed, the display will show an over-range symbol "**OL**".

**⚠ WARNING** When measuring resistance, the circuit should be powered off and all capacitors should be completely discharged prior to testing. A more accurate measurement can be achieved by separating the component from the circuit being tested.

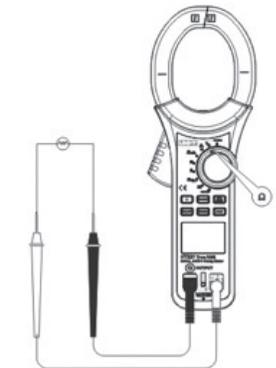


Figure 5

## 5. CONTINUITY $\circ\circ\circ$ (See Figure 7)

- (1) **Insert test leads** - Insert the black test lead into the **COM** input and the red test lead into the " $\Omega$ " input.
- (2) **Set  $\Omega$  function** - Turn the dial to the  $\Omega$  function.
- (3) **Select Function** - There are a total of 3 functions that are accessible by pressing the **SELECT** key. Press the **SELECT** key until the  $\circ\circ\circ$  appears on the display.
- (4) **Test & Measure** - Place the red and black test leads at both the positive and negative points to be measured. The buzzer will sound when the resistance is less than 30 $\Omega$ . When the test leads are not connected or the resistance value is to greater than 100 $\Omega$ , the display will show an over-range symbol "**OL**" and the buzzer will remain silent.

**⚠ WARNING** When measuring continuity, all power to the circuit or cable being tested **MUST** be turned off to prevent damage to the user or the clamp meter.

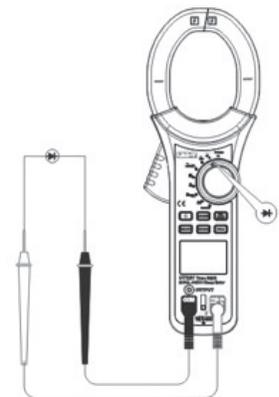


Figure 6

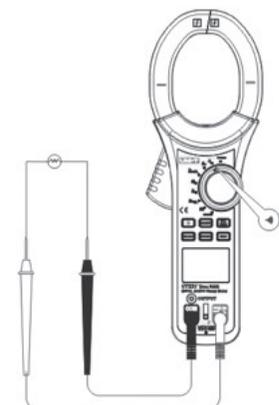


Figure 7

## 6. FREQUENCY MEASUREMENT Hz (See Figure 8)

- (1) **Insert test leads** - Insert the black test lead into the **COM** input and the red test lead into the "**Hz**" input.
- (2) **Set Hz function** - Turn the dial to the **Hz** function.
- (3) **Test & Measure** - Place the red and black test leads at both the positive and negative points to be measured. The clamp meter will automatically select the proper range and the display will show the True RMS value of the measurement being taken while the slave display shows the frequency value of the AC voltage.

**⚠ WARNING** The maximum input range shall not exceed 30Vrms when measuring frequency.

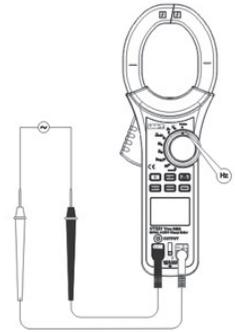


Figure 8

## 7. DC CURRENT MEASUREMENT $\bar{A}$ (See Figure 9)

- (1) **Set  $\bar{A}$  function** - Turn the dial to the  $\bar{A}$  function.
- (2) **Function ZERO Reset** - The clamp meter will sense the geomagnetism and magnetic field around it and may show a range of numbers before testing. Before test & measuring, be sure to reset the DC current function to 0 by pressing the **ZERO** key to clear the clamp meter.
- (3) **Test & Measure** - Using the trigger, open the clamp meters jaw and clamp around the conductor. Make sure that the conductor is positioned in the center and that the flow of current matches the arrow located between the jaws on the body of the clamp meter. The clamp meter will automatically select the proper range and the display will show the value of the measurement being taken. The display will also show a positive or negative measurement depending on the direction of the current.

**⚠ WARNING** The maximum measured current should not exceed 2000A DC when measuring DC current.

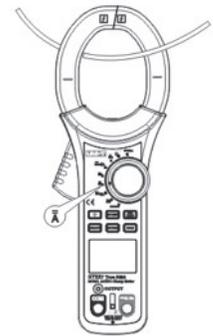


Figure 9

## 8. AC CURRENT MEASUREMENT $\tilde{A}$ (See Figure 10)

- (1) **Set  $\tilde{A}$  function** - Turn the dial to the  $\tilde{A}$  function.
- (2) **Test & Measure** - Using the trigger, open the clamp meters jaw and clamp around the conductor. Make sure that the conductor is positioned in the center and that the flow of current matches the arrow located between the jaws on the body of the clamp meter. The clamp meter will automatically select the proper range and the display will show the True RMS value of the measurement being taken, while the slave display shows the frequency value of the AC current.

Note: When measuring AC current below 500Hz, set the dial to  $\tilde{V} + Lo$ . This is the low pass filter, it will filter high-frequency interference caused by frequencies above 7.5KHz to ensure a stable reading.

**⚠ WARNING** The maximum measured current should not exceed 2000A AC when measuring AC current.



Figure 10

## 9. CURRENT SIGNAL OUTPUT FUNCTION (See Figure 11)

The clamp meter is designed with a signal output function. The current signal measured by the clamp meter can be converted into a voltage signal with the ratio of 1A/1mV. This can be measured through the output terminal where the user can observe the wave form of the current signal by connecting the output signal to an oscilloscope.

**⚠ WARNING** DO NOT connect more than a 5V connection to the output terminal.

## 10. SELECT KEY

The function **SELECT** key is used to switch between functions at the  $\Omega$ ,  $\rightarrow$ ,  $\circ$  measurement settings.

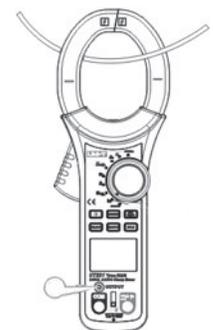


Figure 11

## 11. MAX/MIN

Press the **MAX/MIN** key to obtain the maximum or minimum value. After pressing the key, the maximum value hold function is activated, the screen will hold the current maximum measured value.

Press the **MAX/MIN** key again and the minimum value hold function will be activated and the screen will hold the current minimum measured value. Both functions can be switched by pressing the key. Press and hold the **MAX/MIN** key for 2 seconds disable **MAX/MIN** measurement mode.

## 12. ✨ BACKLIGHT KEY

Press the ✨ key to turn the backlight on and press again to turn it off. This will reset after you power the clamp meter off.

## 13. HOLD

The **HOLD** function key can be used to freeze any reading being measured on any setting. After pressing the **HOLD** key, the displayed value is locked and held until the **HOLD** key is pressed again or until the clamp meter is powered off.

## 14. INRUSH

While measuring AC, press the **INRUSH** key to measure the starting current of a circuit.

Prior to starting the test, the main and slave display will constantly display “----”. When the starting current is detected, the **INRUSH** current will be measured and the slave display will constantly display the inrush measurement value during a 100ms integration period. After that, the clamp meter will perform normal AC current measurements. The main display will show a current value and the slave display will continue to show the inrush value. After the initial inrush detection it is able to enter the **INRUSH** mode again by pressing **INRUSH**. To exit this feature, press of the **INRUSH** key again.

## 15. REL/ZERO

The relative value/zero clearing key has two functions for AC and DC measurements. For AC measurements excluding frequency and DC measurements, the relative value measurement mode can be activated by pressing the **REL/ZERO** key. When the **REL** mode is active, the main display will show Dn-Df, Df is displayed on slave display screen. Df (relative value) is the last measured value prior to pressing the **REL** key, while Dn is the current measured value. After pressing the **REL/ZERO** key, this function is disabled.

## 16. AUTO SHUTDOWN

The **AUTO** shut down function will turn the power off, disabling the clamp meter after 15 minutes.

When powering the clamp meter on, hold the **HOLD** key for 10 seconds and release. Press the **HOLD** key once again and the **AUTO** function will be disabled until the power is reset.

## 17. BUZZER

The **BUZZER** will sound when you press any of the function keys and it will also sound when the dial is turned. The **BUZZER** will also sound when taking measurements for **DIODE** and Continuity. The **BUZZER** will beep three times in continuation 1min prior to auto shutdown; prior to shutdown the **BUZZER** will alarm with a long beep.

# VII. MAINTENANCE

## 1. GENERAL MAINTENANCE

### ⚠ WARNING

It is required to disconnect the test leads before opening the clamp meter to replace the battery.  
Clean the outside of the case with a non abrasive cloth or solvent.

## 2. INSTALLATION OR REPLACEMENT OF BATTERY (See Figure 12)

A standard 9V battery is required for replacement.

Please install or replace the battery as follows:

- a. Shut down the clamp meter and remove the test leads.
- b. With the clamp meter facing down, remove the screw from the battery compartment only. Take off the battery cover.
- c. Remove the old battery and replace it with a new standard 9V battery.
- d. Replace the battery cover and tighten the screw.

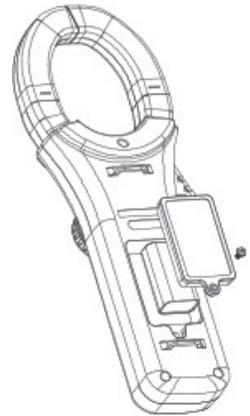


Figure 12

## **SPERRY INSTRUMENTS LIMITED LIFETIME WARRANTY**

Subject to the exclusions and limitations detailed below, Sperry Instruments provides a limited lifetime warranty on products of its manufacture will be free from defects in materials and workmanship under normal use and service.

### **Limited**

Limited means that Sperry Instruments warrants to the original purchasers of products from Sperry Instruments authorized distributors at the time of shipment such products shall be free of defects in material and workmanship while the tool is used under normal working conditions. Standard wear and tear, dulling over time, overloading, misuse, and acts of God are not covered under warranty. This warranty does not cover batteries, fuses, or test leads.

When a warranty claim arises, the purchaser must contact Sperry Instruments. If the defect comes under the terms of this limited warranty, Sperry Instruments will arrange, at its sole discretion, one of the following options:

- Product will be replaced

The purchaser is solely responsible for determining the suitability of Sperry products for the purchaser's use or resale, or for incorporating them into articles or using them in the purchaser's applications. The distributor is authorized to extend the foregoing limited warranty to its original purchasers in connection with the sales of Sperry products, provided that such products shall not have been altered by the distributor. The distributor shall be fully responsible for any warranties the distributor makes to its purchasers which are broader or more extensive than Sperry's limited warranty.

### **Lifetime Warranty**

Warranty Limitation: The forgoing warranties are exclusive and are in lieu of all other express and implied warranties whatsoever, including but not limited to implied warranties of merchantability and fitness for a particular purpose. The foregoing warranties do not cover ordinary wear and tear, abuse, misuse, overloading, alterations, products which have not been installed, operated or maintained in accordance with Sperry's written instructions. Test leads, fuses, batteries and calibration are not covered under any implied warranty. "Lifetime" of products that are no longer offered by Sperry will be either repaired or replaced with an item of Sperry Instruments choice of similar value. Lifetime is defined as 5 years after Sperry discontinued manufacturing the product, but the warranty period shall be at least ten years from date of purchase. Original proof of purchase is required to establish original ownership of product.

No warranty will be honored unless an invoice or other proof of purchase date is provided to Sperry Instruments. Hand written receipts or invoices will not be honored.

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- See more at: <https://www.sperryinstruments.com/en/Resources/Warranty-Information>

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