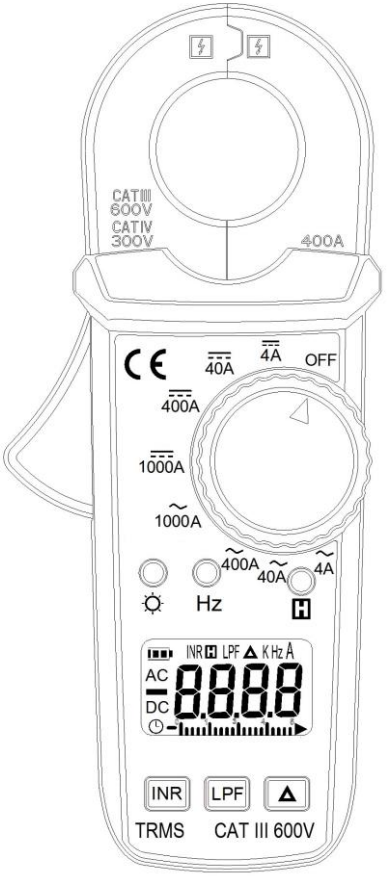
A9+
AC/DC TRMS CLAMP METER
USERS MANUAL



PROVA INSTRUMENTS INC.

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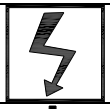
Version: 20190925

Specifications are subjected to change without notice.

EN 61010-2-032
CAT III 600V
CAT IV 300V
Pollution Degree 2

SYMBOLS showed on the clamp meter or in this manual:

	Caution, risk of danger. Refer to accompanying documents
	Caution, risk of electric shock.
	Double Insulation
	Application around and removal from HAZARDOUS LIVE conductors is permitted.
	Earth (ground)
	AC (Alternating Current)
	DC (Direct Current)
	Both direct and alternating current
	Conforms to relevant European Union directives.
	Do not dispose of this clamp meter as unsorted municipal waste. Contact a qualified recycler for disposal.

Overvoltage Category I (CAT I):

Equipment for connection to circuits in which measures are taken to limit the transient overvoltages to an appropriate low level.

Overvoltage Category II (CAT II):

Energy-consuming equipment to be supplied from the fixed installation.

Overvoltage Category III (CAT III):

Equipment in fixed installations, distribution boards, and circuit breakers.

Overvoltage Category IV (CAT IV):

Origin of installation or utility level measurements on primary over-current protection devices and on ripple control units.

SAFETY INFORMATION: (Read First Before Operation)

Please follow the following instructions carefully for safe operation.

- NEVER use the clamp meter for Voltages higher than 600V.
- DO NOT hold the clamp meter beyond its tactile barrier.
- DO NOT use the clamp meter and accessories if they look damaged.
- USE CAUTION when working with high voltages.
- USE CAUTION when measuring the voltages higher than 30VAC rms or 60VDC. These voltages pose a shock hazard.
- USE EXTREME CAUTION when working around bare conductors or bus bars.
- ALWAYS use the clamp meter as the instructions in the manual.

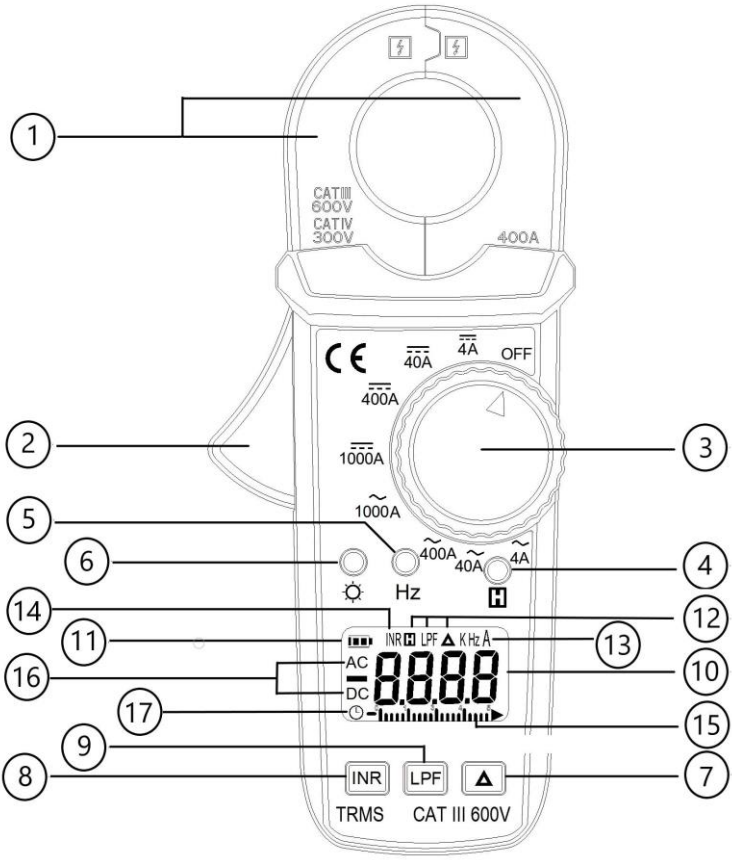
WARNING: If the clamp meter is used in a manner Not specified by the manufacturer, the protection Provided by the clamp meter may be impaired.

TABLE OF CONTENTS

I. Features

1. Min. resolution AC/DC 1mA and max. current range of AC/DC 1000A
2. Super wide range AC/DC 4.000A/40.00A/400.0A/1000A
3. Best accuracy ±1.5%±3dgts for all ranges
4. Accurate and solid AC/DC mini pocket-size clamp meter
5. True RMS measurement
6. One touch zero (△) for DCA adjustment.
7. 25 mm diameter jaws.
8. In-Rush Current Measurement with 100mS integration time
9. Non-Contact Frequency Measurement (min. sensitivity 0.08 ACA)
10. Low Pass Filter (LPF) at 1 KHz Cut-off Frequency
11. Fast bar graph display (30 times/sec.) for transient observation.
12. Data Hold function.
13. Large 3 3/4 digits LCD.
14. 15 minutes auto-power-off with beeping warning before turning off
15. Backlight with 5 minutes auto-backlight-off
16. Easy single rotary switch for function selection.
17. Pocket size ideal for works in crowded switch box or cable areas.

II. Panel Description



1. Moving and Stationary Jaws
   This is used to pick up current signal. To measure DC/AC current, conductor must be enclosed by the jaw.
2. Moving Jaw Trigger
   This is used to open the jaw.
3. Rotary Switch
   This is the on/off switch and used to select the function user desired, such as DCA, or ACA.
4. Data Hold (H) Button
   Once this button is pushed, reading shall be held on the LCD. Press again to

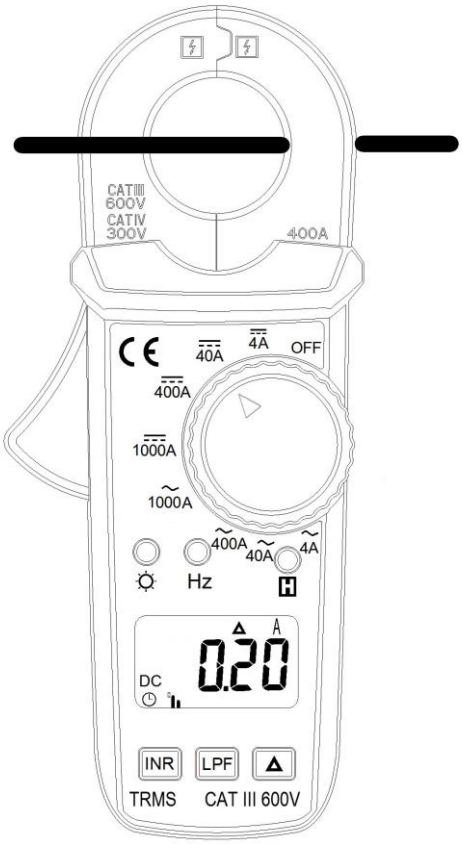
release it.

5. Frequency (Hz) Button
   This button is used to measure frequency of ACA current in the ACA function.
6. Backlight Button
   Press this button to turn the backlight on. Press it again to turn the backlight off. The backlight will turn itself off automatically in 5 minutes.
7. Zero/Relative (△) Button
   Once this △ button is pressed in the ACA function, the current reading shall be set to zero and be used as a zero reference value for all other subsequent measurement. The button (ZERO symbol is displayed in the DCA function) is also used to remove offset value caused by the residual magetism remained in the core for the DCA measurement.
8. INR (In-Rush Current) button
   Press this button to enter the in-rush current mode in ACA functions. For detailed, please refer to the In-Rush Current Measurement of this manual.
9. LPF (Low Pass Filter) button
   Press this button to enable low pass filter in the ACA functions. Once LPF is enabled, the cut-off frequency (-3db) is set at 1 KHz.
10. LCD
    This is a 3 3/4 digit Liquid Crystal Display with maximum indication of 3999. Function symbols, units, bargraph, sign, decimal points, low battery symbols, and zero symbol are included.
11. Low Battery Symbol
    When this symbol appears, it means the battery voltage drops below the minimum required voltage.
12. Data Hold (H), LPF, and Zero/Relative (△) Symbols
    Once the corresponding function is enabled, the corresponding symbol appears on LCD.
13. Units (K, Hz, and A) Symbols
    Once a function is selected, corresponding current unit (A) or frequency (KHz) shall be displayed on LCD.
14. INR symbol
    Once the INR button is pressed, this symbol indicate In-Rush Current Measurement is enabled.
15. 20 segments Bar-graph
    Bar-graph has twenty segments correspond to 4000 counts of reading. It displays segments proportional to the actual reading. Each segment represent two hundred counts.
16. AC and DC symbols
    The AC or DC symbol indicates the ACA or DCA function is selected.
17. Auto Power Off symbol

A clock symbol is displayed to indicate auto power off is enabled.

III. Operation Instructions

3.1 AC/DC Current Measurements



3.1.1 DC Current

a. Set the rotary switch at appropriate DC range.

b. Push the zero (△) button to adjust the reading to zero. The symbol "ZERO" is displayed on LCD.

c. Press the trigger to open the jaw and fully enclose the conductor to be measured. No air gap is allowed between the two half jaws.

d. Read the DCA value from the LCD display.

3.1.2 AC Current

a. Set the rotary switch at appropriate AC range.
b. Press the trigger to open the jaw and fully enclose the conductor to be measured. No air gap is allowed between the two half jaws.
c. Read the ACA value from the LCD display.
d. If △ button is pressed in the ACA function, the symbol of "△" is displayed to indicate relative measurement

Note: If users select AC/DC 400 or 1000A range to measure a current greater than 100A, it could cause greater residual magnet retained within the jaws. If users then select DC 4 or 40A for subsequent measurement, the residual reading might be larger than usual. Users can press the ZERO(△) button to remove the residual value.

Note: Only for the first measurement after power on, it would take around one minute to display the first measurement result if the measurement value is under 5 counts.

3.2 Frequency (Hz) Measurement

a. Set the rotary switch at appropriate ACA range.
b. Press the trigger to open the jaw and fully enclose the conductor to be measured. Enclose only one line of the line source and make sure there is current flowing.
c. press the Hz button
d. Read the frequency (Hz) value from the LCD display.

Note: Make sure there is at least 0.08A for 4A AC range (0.4A for 40A AC range, 4A AC for 400A range and 40A AC for 1000A range) following through the conductor for frequency (Hz) measurement.

3..3 Relative (Δ) Reading Measurements

The zero (Δ) button also can be used to make a relative measurement in the ACA function. Once the button is pushed, the current reading is set to zero and a zero (Δ) symbol shall be displayed on LCD. All the subsequent measurement shall be displayed as a relative value with respect to the value being zeroed. Press the zero (Δ) button for 2 seconds to return to normal mode.

Note: If the (ZEROed value +relative measured value) is greater than the range (4000 counts), the meter will still show OL under ZERO function. Namely, if the absolute measured value is greater than 4000 counts, LCD shows OL.

3.4 Data Hold of the LCD Reading

Press the HOLD button, then the reading shall be held and kept on LCD.

3.5 In-Rush Current (INR) Measurement

When an electrical device (e.g. AC motor) is first turned on, surge current (inrush current) occurs. Surge current (Inrush current) is usually much larger than normal operating current. Once the device reach its normal operating condition, the current stabilizes at normal operating current.

In the ACA current functions (4A, 40A, 400A, 1000A), press the INR (In-Rush Current) button to enter the in-rush current mode. The clamp meter will start a 100mS integration window and calculate the RMS value when a current of 0.2 A for 4A range is detected.

Note: The trigger currents (threshold) are 2A for 40A AC range, 20A for 400A AC range and 200A for 1000A AC range.

3.6 Auto Power Off

The clamp meter will turn itself off in 15 minutes. To turn it back on just press any buttons or rotary switch to a different position.

To disable the auto power off function, press and hold any buttons (except the HOLD button) and turn the clamp meter on.

IV. Specifications (23℃±5℃, Accuracy is indicated as % of reading, and the conductor is placed at the center of jaws)

DC Current (% of reading):

Range	Resolution	Accuracy	Overload Protection
4A	1mA	±1.5%±3dgts	DC 1000A
40A	10mA		
400A	100mA		
0-900A(1000A)	1A		
900-1000A(1000A)	1A	±2.0%±3dgts	

AC Current (True RMS, Crest Factor ≦ 3, % of reading):

		Accuracy[1]		Overload Protection
Range	Resolution	50/60 Hz	40 - 400Hz	
4A	1mA	±1.5%±3dgts	±2.0%±4dgts	AC 1000A
40A	10mA			
400A	100mA			
0-900A(1000A)	1A			
900-1000A(1000A)	1A	±2.0%±3dgts	±2.5%±4dgts	

[1]Add 2% when C.F. ≧ 2

Frequency (auto range, periodic and zero crossing signal):

Range	Range (Hz)	Resolution (Hz)	Sensitivity (A)	Accuracy
4A	1 – 10	0.1	0.2	±0.5%±2dgts
4A	10 – 4K	0.1/1	0.08	
4A	4K – 40K	1/10	0.20	
40A	1 – 10	0.1	1.5	
40A	10 – 4K	0.1/1	0.8	
400A	2 – 4K	0.1/1	4	
1000A	1 – 4K	0.1/1	40	

Overload protection all range AC 1000A

In-Rush Current (AC, start from 0A, Integration Time 100mS**)**

Range	Trigger Current (threshold)
4A	0.2A
40A	2A
400A	20A
1000A	200A

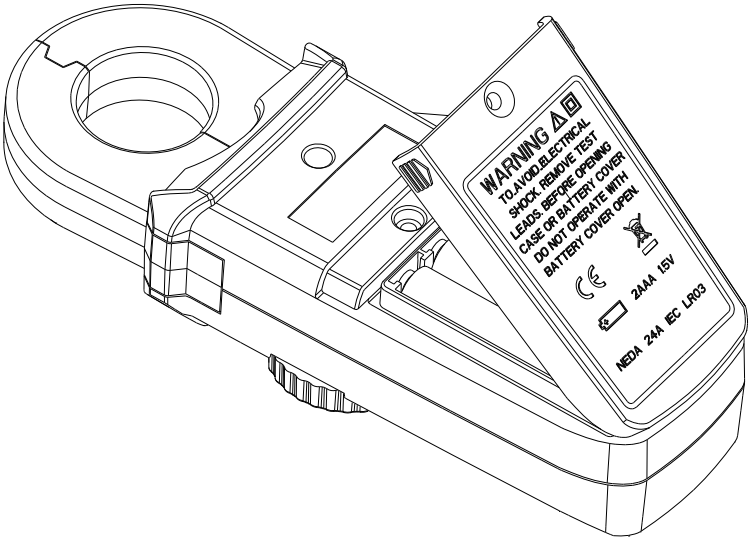
AC Low Pass Filter (LPF, Cut-off frequency (-3db) 1 KHz (approx.)**)**

Range	Resolution	Accuracy (of reading, 50/60Hz)
4A	0.001	3%±5dgts
40A	0.01	
400A	0.1	
0 – 900A (1000A)	1	
900-1000A(1000A)	1	4%±5dgts

Indoor Use

Conductor Size:	0.98" / 25mm max. (approx.)
Battery Type:	two 1.5V LR03 AAA size
Display:	3 3/4 LCD with 20 segments Bar-graph
Range Selection:	manual
Overload Indication:	OL
Power Consumption:	22mA with backlight off (approx.)
Low battery Indication:	B
Sampling Time:	3 times/sec. (digits), 30 times/sec. (bargraph)
Operating Temperature:	-10◦C to 50◦C
Operating Humidity:	less than 85% relative
Storage Temperature:	-20◦C to 60◦C
Storage Humidity:	less than 75% relative
Altitude	up to 2000M
Dimension:	152mm (L) x 66mm (W) x 36mm (H)
	6.0" (L) x 2.6" (W) x 1.4" (H)
Weight:	190g (battery included)
Accessories:	Carrying bag x 1
	Users manual x 1
	1.5V AAA battery x 2

V. Battery Replacement



When the low battery symbol is displayed on the LCD, replace the old batteries with two new batteries.

A. Turn the power off.
B. Remove the screw of the battery compartment.
C. Lift and remove the battery compartment.
D. Remove the old batteries.
E. Insert two new 1.5V SUM-3 batteries.
F. Replace the battery compartment and secure the screw.

VI. Maintenance & Cleaning

Servicing not covered in this manual should only be performed by qualified personnel. Repairs should only be performed by qualified personnel.

Periodically wipe the case with a damp cloth and detergent; do not use abrasives or solvents.