

870F

DIGITAL POWER DUAL DISPLAY CLAMP METER OPERATION MANUAL

1. SAFETY INFORMATION

⚠ Warning

To avoid possible electric shock or personal injury, and to avoid possible damage to the Meter or to the equipment under test, adhere to the following rules:

Before using the Meter inspect the case. Do not use the Meter if it is damaged or the case (or part of the case) is removed. Look for cracks or missing plastic. Pay attention to the insulation around the connectors.

Inspect the test leads for damaged insulation or exposed metal. Replace damaged test leads with identical model number or electrical specifications before using the Meter.

Do not apply more than the rated voltage, as marked on the Meter.

When measurement has been completed, disconnect the connection between the test leads and the circuit under test, remove the testing leads away from the input terminals of the Meter and turn the Meter power off.

Do not carry out the measurement when the Meter's back case and / or battery door is opened to avoid electric shock.


When the Meter working at an effective voltage over 30V in AC, special care should be taken.

Use the proper terminals and function for your Measurements.

Do not use or store the Meter in an environment of high temperature, humidity, explosive, inflammable and strong magnetic field. The performance of the Meter may deteriorate after dampened.

Do not use the Meter if the surface of it is wet or the user's hands are wet.

When using the test leads, keep your fingers behind the finger guards.

Replace the battery as soon as the battery Indicator  appears. With a low battery, the Meter might produce false readings that can lead to electric shock and personal injury.

When opening the battery door, must make sure the Meter is power off.

When servicing the Meter, use only the same model number or identical electrical specifications replacement parts.

The internal circuit of the Meter shall not be altered at will to avoid damage of the Meter and any accident.

Soft cloth and mild detergent should be used to clean the surface of the Meter when servicing.

No abrasive and solvent should be used to prevent the surface of the Meter from corrosion, damage and accident.

The Meter is suitable for indoor use.

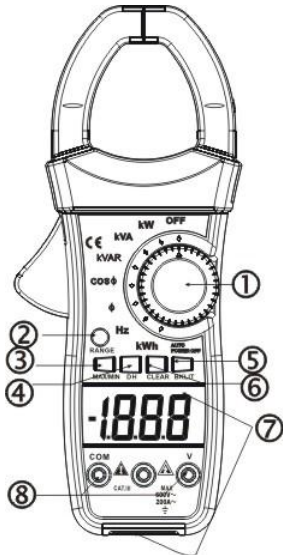
Turn the Meter off when it is not in use and take out the battery when not using for a long time.

Constantly check the battery as it may leak when it has been using for some time, replace the battery as soon as leaking appears.

A leaking battery will damage the Meter.

2. SPECIFICATIONS

2.1 Panel Layout



- 1) Rotary Switch: use this switch to select functions and ranges
- 2) RANGE key: Push the key to select AC Current range
- 3) MAX/MIN key: Press to start recording of maximum / minimum value, it valid at voltage, current, active power and apparent power ranges only
- 4) D.HOLD key: In any range, push the key, the present display value will be locked and the " H " symbol will appear, push it again

to exit HOL and the " H " symbol disappear

5) Back light key: Push the LIGHT button to light the backlight then it will auto light off after approx. 5 seconds..

6) Clear key: At active energy range, press to reset time the zero, then restart the timing. At all other ranges, press to clear stored readings.

7) LCD Display

8) V Input Jack , COM Input Jack

2.2 GENERAL SPECIFICATIONS

Display: Multi LCD displays, Maximum display 9999.

• Ranges: Auto

• Overloading: Display **OL**.

• Battery Deficiency: Display .

• Data Holding: Display

• Maximum and Minimum value display: Voltage, Current, Active Power and Apparent Power ranges

• Display Backlight: White color

• Calibration Feature

• Sleep Mode: To preserve battery life, the Meter automatically turns off if you do not turn press any button for around 15 minutes, except at active factor range.

• Sampling: 3 times per second.

• Power: **9 V Alkaline batteries**

B. Environmental Requirements

• The Meter is suitable for indoor use.

• Altitude: Operating: 2000m、Storage: 10000m

• Temperature and humidity:

Operating:

0 ~ 30 (85%R.H.)、30 ~ 40 (75%R.H.)、40 ~ 50 (45%R.H)

Storage: -10 ~ +60 (85%R.H)

• Safety/ Compliances: IEC 61010 CAT.III 600V, CAT.IV 300V overvoltage and double insulation standard, pollution degree 2

2.3 ELECTRICAL SPECIFICATIONS

Accuracies are \pm (% of reading + number in last digit) at 23 \pm 5 $^{\circ}$ C, \leq 75%RH.

2.3.1 AC Voltage (True RMS)

Range	Accuracy	Resolution
0.5V	$\pm(1.2\%+5)$	0.1V
10V	$\pm(1\%+5)$	0.1V
100V	$\pm(1\%+5)$	0.1V
600V	$\pm(1\%+5)$	0.1V

Allowable maximum overload protection voltage: 600V RMS

Allowable minimum overload protection voltage: 100V RMS

Impedance: 10M Ω

2.3.2 AC Current (True RMS)

Range	Accuracy	Resolution
0.3A-10A	$\pm(2\%+15)$	0.01A
10A-300A	$\pm(2\%+5)$	0.1A
10A-500A	$\pm(2\%+5)$	1A

Allowable maximum overload protection current: 500A RMS

Allowable minimum overload protection current: 0.3A RMS

2.3.3 Frequency

Range	Accuracy	Resolution
45Hz~100Hz	$\pm(0.5\%+5)$	0.01Hz
100Hz~400Hz	$\pm(0.5\%+5)$	0.1Hz

Allowable maximum overload protection voltage: 600V RMS

Allowable minimum overload protection voltage: 1V RMS

2.3.4 Active Power ($w = V \times A \times \cos \Phi$)

Range	Accuracy	Resolution
3W-100W	$\pm(4\%+20)$	0.1W
100W -1000W	$\pm(4\%+15)$	0.1W
1kW-300kW	$\pm(3\%+15)$	0.1kW

AC Current range 1: Max 600V/500A; Min 10V/5A

AC Current range 2: Max 600V/300A; Min 10V/5A

AC Current range 3: Max 300V/3A; Min 10V/0.3A

2.3.5 Apparent Power ($VA = V \times A$)

Range	Accuracy	Resolution
3VA-100VA	$\pm(4\%+20)$	0.1VA
100VA - 1000VA	$\pm(4\%+15)$	0.1VA
1KVA - 245KVA	$\pm(3\%+15)$	0.1KVA

AC Current range 1: Max 550V/450A; Min 10V/10A

AC Current range 2: Max 500V/250A; Min 10V/5A

AC Current range 3: Max 300V/3A; Min 10V/0.3A

2.3.6 Reactive Power ($Var = V \times A \times \sin \Phi$)

Range	Accuracy	Resolution
3VAr-100VAr	$\pm(4\%+20)$	0.1 VAr
100VAr -1000VAr	$\pm(4\%+15)$	0.1VAr
1KVar -120KVar	$\pm(3\%+15)$	0.1 KVar

AC Current range 1: Max 600V/500A; Min 10V/10A

AC Current range 2: Max 500V/300A; Min 10V/5A

AC Current range 3: Max 300V/3A; Min 10V/0.3A

2.3.7 Power Factor ($PF = W/VA$)

Range	Accuracy	Resolution	Measuring Condition
0.3 ~ 1 (capacitive or inductive)	±0.025	0.001	The minimum measuring current 1A Measuring voltage less than 1V
0.3 ~ 1 (capacitive or inductive)	For reference only		The minimum measuring current 1A Measuring voltage less than 1V V

2.3.8 Phase Angle ($PG = \cos(\phi)$)

Range	Accuracy	Resolution	Measuring Condition
0°~360°	±1°	1°	The minimum measuring current 0.3A The minimum measuring voltage 10V
0°~360°	For reference only		Measuring current less than 0.3A OR Measuring voltage less than 10V

-Min Input Current/Voltage: 0.3A/10V

2.3.9 Active Energy (kWh)

Range	Accuracy	Resolution
0~1.000 kWh	±(3%+10)	0.001kWh
1~100.0 kWh	±(3%+5)	1.0 kWh
1~100.0 kWh	±(3%+5)	1.0kWh

3.Measurement Operation

1、Active Power(kW)+Voltage(V)+Current(A)

- (1) Set Rotary Switch to "Active Power(kW)+Voltage(V)+Current(A)" position.
 - (2) Clamp the wire , connect the black test lead to "COM" socket and red test lead to the "V" socket, LCD displays the values of active power (kW) and voltage (V) and current(A).
 - (3) Maximum range of active power is 300 kW, if exceed the range, the "9999" symbol will display.
 - (4) Press MAX/MIN key, LCD displays "MAX"symbol, then the maximum values of active power and voltage and current in the process of measuring are displayed; Reprress MAX/MIN key, LCD displays"MIN"symbol, then the minimum values of active power and voltage and current in the process of measuring are displayed; Press MAX/MIN key the third time, the present values of active power and voltage and current are displayed.
- Note: Please do not measure AC Voltage of more than 600V (v.r.s) and AC Current of more than 500A (v.r.s).

2、Apparent Power(kVA)+ Voltage(V)+Current(A)

- (1) Set Rotary Switch to "Apparent Power(kW)+Voltage(V)+Current(A)" position.
 - (2) Clamp the wire , connect the black test lead to "COM" socket and red test lead to the "V" socket, LCD displays the values of apparent power (kW) and voltage (V) and current(A).
 - (3) Maximum range of apparent power is 245 kW, if exceed the range, the "9999" symbol will display.
 - (4) Press MAX/MIN key, LCD displays "MAX"symbol, then the maximum values of apparent power and voltage and current in the process of measuring are displayed; Reprress MAX/MIN key, LCD displays"MIN"symbol, then the minimum values of apparent power and voltage and current in the process of measuring are displayed; Press MAX/MIN key the third time, the present values of apparent power and voltage and current are displayed.
- Note: Please do not measure AC Voltage of more than 550V (v.r.s) and AC Current of more than 450A (v.r.s).

3、Reactive Power(kVar)+ Voltage(V)+Current(A)

- (1) Set Rotary Switch to "Reactive Power(kW)+Voltage(V)+Current(A)" position.
 - (2) Clamp the wire , connect the black test lead to "COM" socket and red test lead to the "V" socket, LCD displays the values of reactive power (kW) and voltage (V) and current(A).
 - (3) Maximum range of reactive power is 120 kW, if exceed the range, the "9999" symbol will display.
 - (4) Press MAX/MIN key, LCD displays "MAX"symbol, then the maximum values of reactive power and voltage and current in the process of measuring are displayed; Reprress MAX/MIN key, LCD displays"MIN"symbol, then the minimum values of reactive power and voltage and current in the process of measuring are displayed; Press MAX/MIN key the third time, the present values of reactive power and voltage and current are displayed.
- Note: Please do not measure AC Voltage of more than 600V (v.r.s) and AC Current of more than 500A (v.r.s).

4、Power Factor (cos(φ)) + Voltage(V)+Current(A)

- (1) Set Rotary Switch to "Power Factor (cos(φ)) +Voltage(V)+Current(A)" position.
- (2) Clamp the wire , connect the black test lead to "COM" socket and red test lead to the "V" socket, LCD displays the values of power factor (cos(φ)) and voltage (V) and current(A).

(3) For this position, there is no function of maximum measurement and minimum measurement.
Note: Please do not measure AC Voltage of more than 600V (v.r.s) and AC Current of more than 500A (v.r.s).

5、Phase Angle(φ)+ Voltage(V)+Current(A)

- (1) Set Rotary Switch to "Phase Angle(φ)+Voltage(V)+Current(A)" position.
- (2) Clamp the wire , connect the black test lead to "COM" socket and red test lead to the "V" socket, LCD displays the values of phase angle(φ) and voltage (V) and current(A).

(3) For this position, there is no function of maximum measurement and minimum measurement.
Note: Please do not measure AC Voltage of more than 600V (v.r.s) and AC Current of more than 500A (v.r.s).

6、Frequency(Hz)+ Voltage(V)+Current(A)

- (1) Set Rotary Switch to "Frequency(Hz)+Voltage(V)+Current(A)" position.
- (2) Clamp the wire , connect the black test lead to "COM" socket and red test lead to the "V" socket, LCD displays the values of frequency(Hz) and voltage (V) and current(A).

(3) For this position, there is no function of maximum measurement and minimum measurement.
Note:

(1) Please do not measure AC Voltage of more than 600V (v.r.s) and AC Current of more than 500A (v.r.s).

(2) Frequency measurement measures frequency of voltage signal, not frequency of current signal.

7、Active Energy(kWh)+Active Power(kW)+Time(mm:s)

- (1) Set Rotary Switch to "Active Energy(kWh)+Active Power(kW)+Time(mm:s)" position.
- (2) Clamp the wire , connect the black test lead to "COM" socket and red test lead to the "V" socket, LCD displays Energy value and measure time. And then Energy value will rise with time .Press HOLD button for hold Energy value and reading anytime but measure time continue.Press HOLD button again for continue Energy value add up until reach 24 hours or select other function . Maximum of Energy value measure is "100kWh". Will display"9999"if above this value.
- (3) For this position, there is no function of maximum measurement and minimum measurement.
- (4) Press CLEAR key, time recounts and measures.

Note:

(1) Please do not measure AC Voltage of more than 600V (v.r.s) and AC Current of more than 500A (v.r.s).

(2)Will not working if without signal input when measure Energy value. Please waiting 10 seconds at most if confirm have signal input and then Timing starts.

(3) The data is not saved after power off, it recounts after restarting.

MAINTENANCE

This section provides basic maintenance information including battery replacement instruction.

Warning

Do not attempt to repair or service your Meter unless you are qualified to do so and have the relevant calibration, performance test, and service information.

To avoid electrical shock or damage to the Met do not get water inside the case.

A. General Service

- Periodically wipe the case with a damp cloth and mild detergent. Do not use abrasives or solvents.
- To clean the terminals with cotton bar with detergent, as dirt or moisture in the terminals can affect readings.
- Turn the Meter power off when it is not in use.
- Take out the battery when it is not using for a long time.
- Do not use or store the Meter in a place of humidity, high temperature, explosive, inflammable and strong magnetic field.

B. Replacing the Battery

Warning:To avoid false readings, which could lead to possible electric shock or personal injury, replace the battery as soon as the battery indicator "E" appears.

Make sure the transformer jaw and the tests leads are disconnected from the circuit being tested before opening the case bottom.

To replace the battery:

1. Press **POWER** to turn the Meter off and remove all the connections from the input terminals
2. Turn the Meter's front case down.
3. Remove the screw from the battery door, and separate the battery door from the case bottom.
4. Rejoin the case bottom and the battery compartment, and reinstall the screw.

Above picture and content just for your reference. Please be subject to the actual products if anything different or updated. Please pardon for not informing in advance.