
Operation manual

V2.0

DLM-7506

Single Phase Energy Meter Portable Test Equipment

Notes to users

The text and graphics related to the operation manual are only for the users of the device, and shall not be provided to a third party in any form and manner without the permission of the company.

The copyright and interpretation right of this manual belong to our company, changes caused by the version upgrade are subject to notice.

This device is a high-precision measuring instrument. Please read this manual carefully before use.

Due to the technical progress and product update, the company will make improvements to the product, so that there may be some differences in the equipment and manual, but it will not affect the use. If you have any questions, please consult the customer service department of the company.

In principle, the warranty period of this product is one year, but the following items are not within the scope of warranty: it has been arbitrarily replaced or repaired by non company repairmen, or it has been misoperated or negligently used; Damage caused by accident or natural disaster, or has been disturbed by high voltage or input abnormal voltage, or the fuselage number has been changed; It also does not include the removal service, device shell, control knob and all accessories after installation.

The product is provided with lifelong service, and the service cost will be charged after the warranty period.

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Chapter 1 Product overview

This Three Phase Energy Meter Portable Test Equipment is a portable tabletop watt hour meter inspection device with high-tech content developed and produced by our company. The product is equipped with a three-phase high stability programmable power source developed and produced by our company. Three phase Reference Standard Energy Meter, Simple function test can be realized by keyboard operation, and it can also be controlled and managed by PC. Complete PC inspection items. The test device has the advantages of high measurement accuracy, good long-term stability, high automation, wide output range, small distortion and high stability.



Be careful : To ensure that your work goes smoothly and that you and the equipment you use are safe, please read this instruction carefully before using this product.

Chapter 2 Functional features

Display	7 inch 800*480 dot matrix HMI color LCD display (capacitance)
Output	voltage: 50~293V current: 1mA~120A
Range Switching	Auto、Manual
Multifunctional measurement	a) voltage、current、phase、frequency、power(Active、reactive、Apparent)、power factor b) Simultaneous measurement of voltage, current and power stability c) Vector Graph Display: 0~359.99° d) Waveform display, harmonic analysis, distortion calculation, spectrum display, display the amplitude, content, phase of harmonics
Harmonic analysis	2ed~31th harmonics
Data display	It can intuitively display the working state of measurement and a variety of measurement data, as well as the waveform of measured voltage and current, voltage and current phase vector diagram and harmonic spectrum analysis diagram
Communication	Asynchronous communication RS232, Baud rate 9600bps
Appearance	460*200*500mm (Length * height * depth)
Function	a) Three electric energy meters can be adjusted or verified at the same time b) It is applicable to the adjustment or verification of various single-phase and three-phase mechanical watt hour meters or single-phase and three-phase electronic watt hour meters with the same specifications and different constants

Chapter 3 Technical indicators

1. Output: Voltage and Current

	Voltage	Current
Range	240V	0.1A、1A、5A、20A、100A
Capacity	15VA(240V)/Piece	100VA (100A)

Max	293V	120A
Adjust	0~122%RG	0~120%RG
Step	10%、1%、0.1%、0.01%	
Distortion degree	$\leq 0.5\%$ (Linear load)	

2. Output: Phase

	Phase Adjust
Range	$0^{\circ} \sim 359.99^{\circ}$
Step	10° 、 1° 、 0.1° 、 0.01°

3. Output: Frequency

	Frequency Adjust
Range	40~70Hz
Step	0.01Hz

4. Output: Power

	Power
Stability	$\leq 0.02\%$ (180S) (PF>=0.8)

5. Output: Symmetry

	Voltage	Current	Phase
Symmetry	$\leq 0.2\%$	$\leq 0.2\%$	$\leq 0.2^{\circ}$

6. Harmonic setting

	Harmonic
Number	2th~31th
Content	$\leq 40\%$
Phase	$0^{\circ} \sim 359.99^{\circ}$

7. Working environment

ambient temperature	Normal temperature type: $10 \sim 40^{\circ}\text{C}$
Preheating time	20 Minutes
humidity	$45 \sim 0\%\text{R.H}$
Power supply	$\text{AC}220\text{V} \pm 10\% \quad 50\text{Hz} \pm 1\%$
Power waste	300W (Max)

Chapter4 Operation

1. Keyboard panel

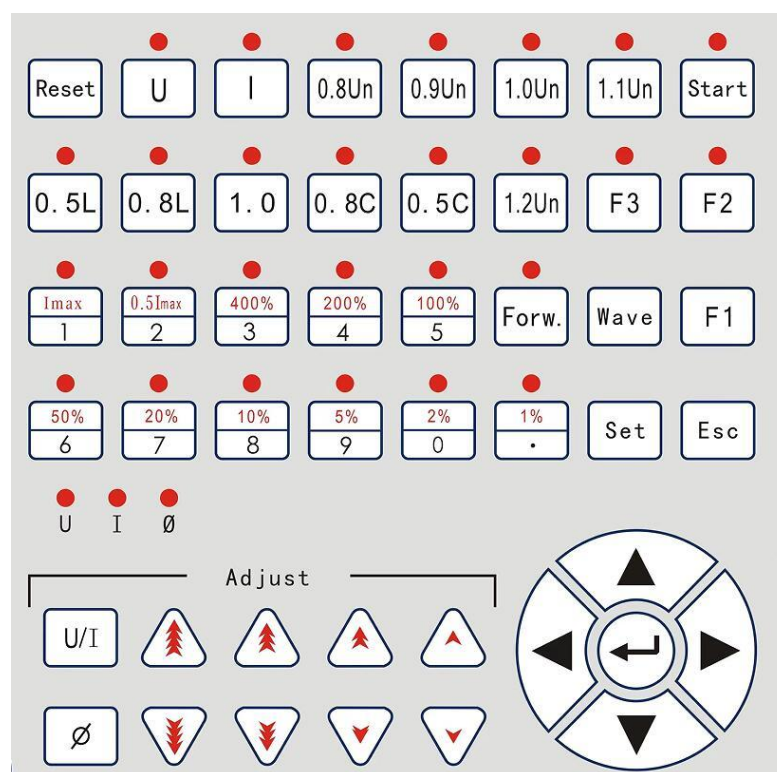


Figure 4. 1. 1 Keyboard

Key Description:

- ① $\uparrow \downarrow \rightarrow \leftarrow$: Direction key;
- ② 1%—I_{max} : Current Load rate key;
- ③ 0—9: Number key;
- ④ $\cdot$: decimal point key;
- ⑤ U、I: Switching key of voltage and current output;
- ⑥ 0.5L、0.8L、1.0、0.8C、0.5C : Power factor key;
- ⑦ 0.8U_n、0.9U_n、1.0U_n、1.1U_n、1.2U_n: Voltage Load rate key;
- ⑧ Forw.: Forward current / reverse current switch key;
- ⑨ Adjust: Adjust the rise and fall of voltage and current amplitude;
Adjust voltage and current phase lead lag;
- ⑩ U/I/ ϕ : Adjustment selection keys of voltage, current or phase;

2. Turn on

- a) Check the power cord;
- b) After confirming that the wiring is correct, turn on the power switch on the rear panel of the instrument. After hearing the "tick" sound, the display lights up and displays the picture as shown in Figure 4.2.1, indicating that the power supply is normal;
- c) Wait "Loading" After, the system is started and the default interface is the main interface;



Figure 4.2.1 Boot interface

3. Shut down

- a) Output voltage and current are zero;
- a) After confirming that there is no output, turn off the power switch;

⚠ Be Careful: Before shutdown, the instrument must be in no output state, otherwise it will cause power amplifier board failure.

4. Main Interface

Turn on the test equipment and enter the main interface mode after loading:

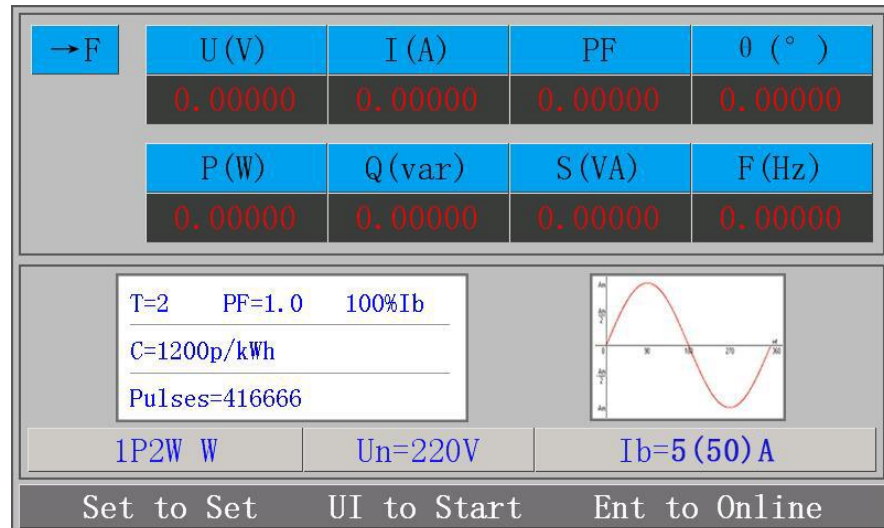


Figure 4. 4. 1 Main Interface

5. Type of energy meter

At Main Interface , Press the "Set" enter the setting menu

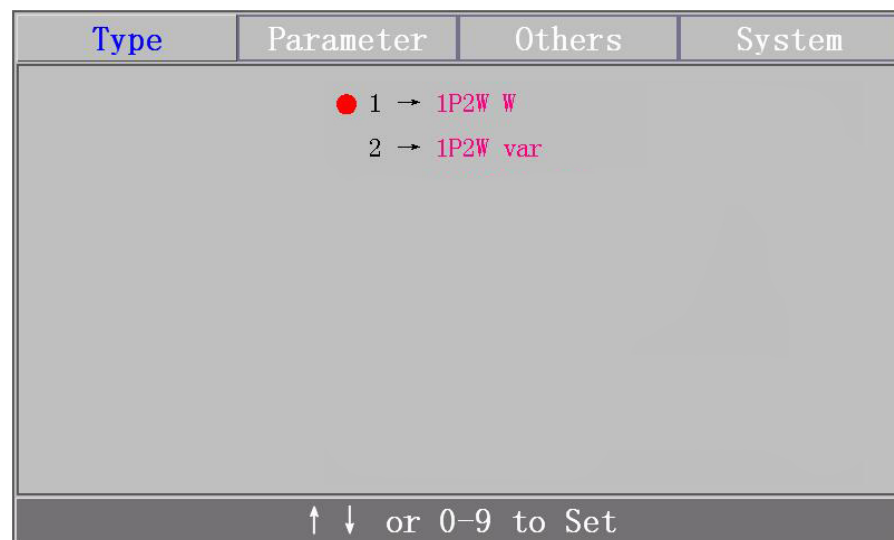


Figure 4. 5. 1 Energy meter type

- 0-9 (" ↑ " or " ↓ "), Move " ● " : Select the type of electric energy meter;
- "← " or "→ " : Select the Other interfaces;
- " ESC " : Back to the main interface;

6. Meter parameter interface

- a) " ↑ " or " ↓ " , Move " ● " : Select the corresponding setting item
- b) 0-9、" ." :Set selected parameters;

Type	Parameter	Others	System
Type: 1P2W W	● Un= 220.00 V Ib= 05.000 A I_{max}= 050.0 A F= 50.00 Hz T= 004 T_{min}= 002 T_{max}= 010 C= 0001200.00 p./kWh Class= 0.5		
0-9 to Set		F1 to select r or p	

Figure 4.6.1 Meter parameter interface

- c) " Ent " : Save the setting;
- d) The effective setting range of frequency is 40.00Hz----70.00Hz;
- e) " F1 " :Constant type selection
 - ① " p/kWh " : Electronic watch (Denoted by P) ;
 - ② " r/kWh", Mechanical watch (Denoted by R) ;
- f) " ← " or " → " : Select the Other interfaces;
- g) " ESC " :Back to the main interface;

7. Creep&Start parameter interface

Type	Parameter	Others	System
● Creep U: 100 %Un Creep I: 000.0 mA Creep T: 01 m 00 s Screen T: 030 s Start I: 002 mA Start T: 01 m 00 s Screen T: 030 s			
0-9 to Set			

Figure 4.7.1 Creep&Start parameter interface

- a) " ↑ " or " ↓ " , Move " ● " : Select the corresponding setting

items;

- b) 0-9、 ” . ” : Set selected parameters;
- c) ” Ent ” : Save the setting;
- d) ” ← ” or ” → ” : Select the Other interfaces;
- e) ” ESC ” : Back to the main interface ;

8. Equipment parameters

Type	Parameter	Others	System
● Number: 03 Range Modify: ON Angle Modify: ON Pulse Input: ↑ Alarm: 1-1 U Output: Y Display: PF			
Ent to Set			

Figure 4. 8. 1 Equipment parameters interface

- a) ” ↑ ” or ” ↓ ” , Move ” ● ” : Select the corresponding setting item
- b) 0-9、 ” . ” : Set selected parameters;
- c) ” Ent ” : Save the setting;
- d) ” ← ” or ” → ” : Select the Other interfaces;
- e) ” ESC ” : Back to the main interface ;

9. Waveform setting

At main interface ,press the ”Wave” enter the waveform interface

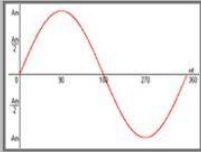
Waveform	Analysis	Stability
● Sine wave 		
Ent to Set		

Figure 4.9.1 Set Waveform interface

- "Ent": Select the waveform (Fundamental waveform、Subharmonic waveform、Harmonic waveform、90 Degree Phase Fired waveform、Quadriform waveform、Peaked waveform);
- Optional waveform (Multiple zero crossing voltage waveform、Multiple zero crossing current waveform、Pulse waveform);
- "ESC": Back to the main interface;

For example:

At waveform setting interface, select the waveform is harmonic:

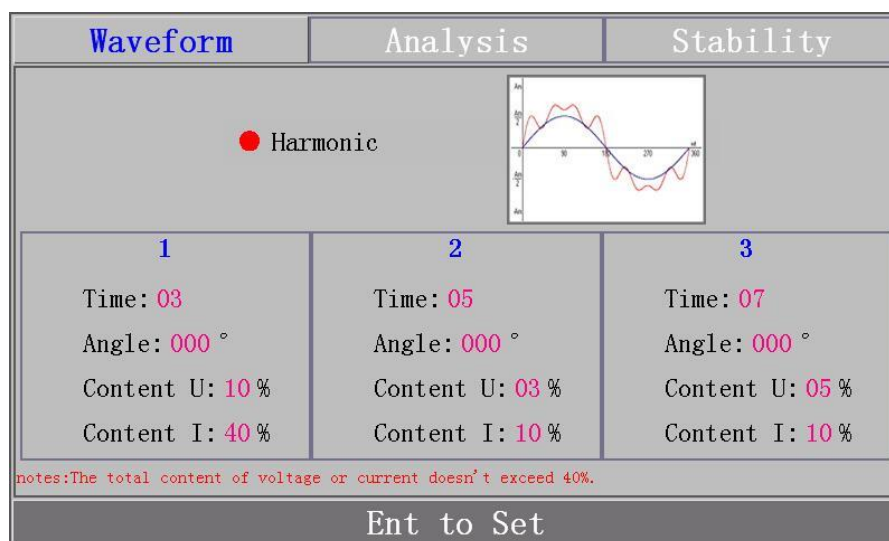


Figure 4.9.2 Harmonic interface

- "↑"、"↓"、"←"、"→": Select the setting value of corresponding harmonic
- 0-9: Set selected parameters;
- "ESC": Back to the main interface;

10. Creep test

After setting the creep parameters, press the key "F3" on the main interface to start the creep test

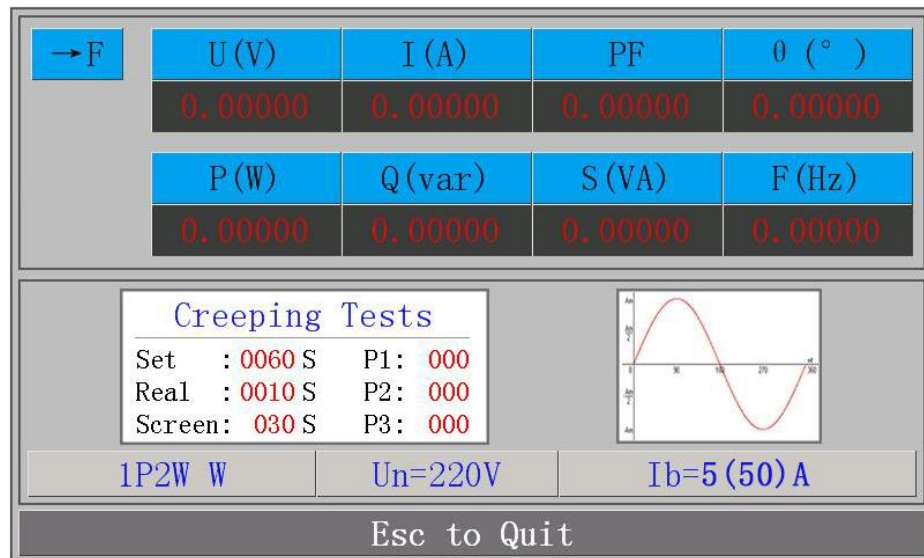


Figure 4. 12. 1 Creep test interface

11. Start test

After setting the creep parameters, press the key “F2” on the main interface to start the creep test

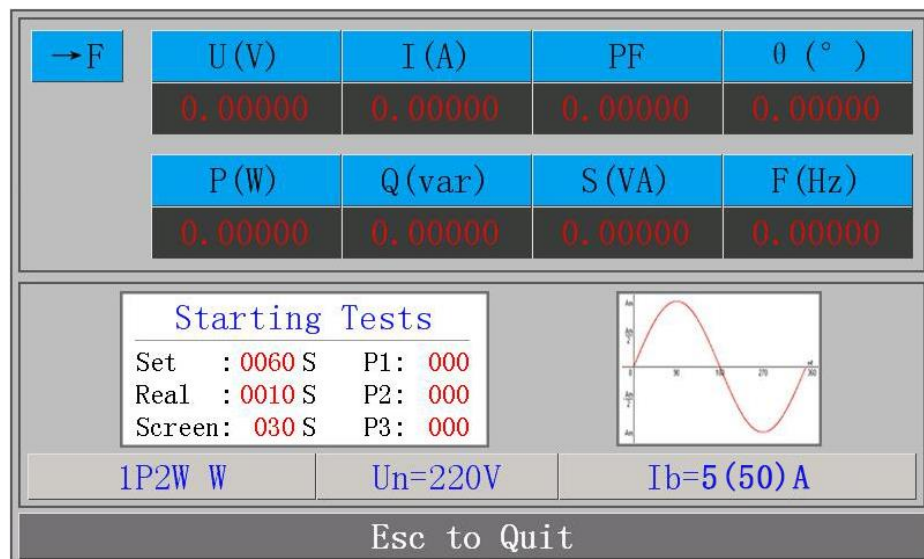


Figure 4. 13. 1 Start test interface

12. Output regulation

- On test status, press Key “U/I / φ ” to select the category to be adjusted, and press Key “a/b/c” to select the phase to be adjusted; Select the corresponding key according to the value to be adjusted;
- If U or I are selected, the Step is adjusted : 10%、1%、0.1%、0.01%;

- c) If ϕ is selected, the Step is adjusted : 10° 、 1° 、 0.1° 、 0.01° ;

13. Calibration test of electric energy meter

After setting the Meter parameters, press the key “Start” on the main interface to conduct the Calibration test

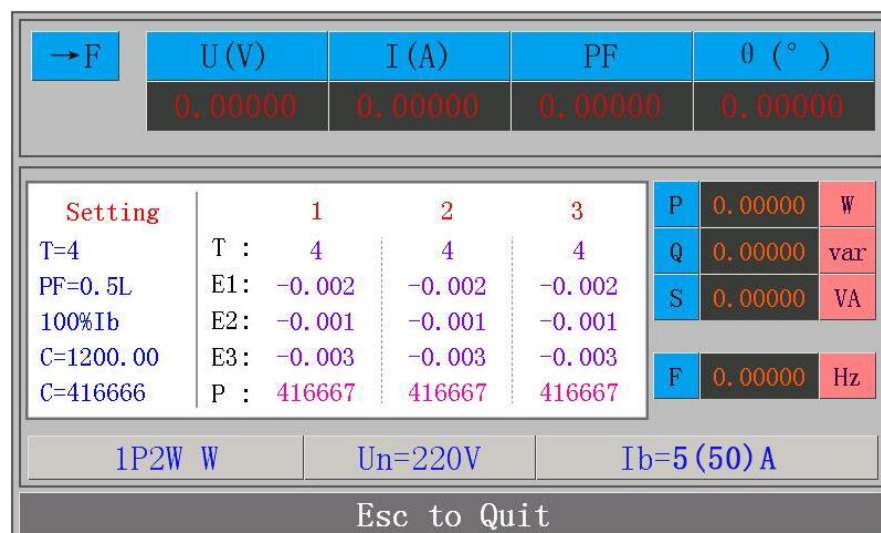


Figure 4.15.1 Calibration test interface

- 1、2、3: number of meter
- T: the number of pulse;
- E1、E2、E3: It indicates the initial three error values, and each new error will be displayed at E3, and the color will flicker;
- P: High frequency pulse number of standard meter;
- In the calibration state, Press key “SET” can enter the setting interface to set T、Tmax、Tmin and Constant

Chapter 5 Online

Under non verification status ,Press “←” “ ” in the main interface to switch online or keyboard

Refer to the software operating instructions.

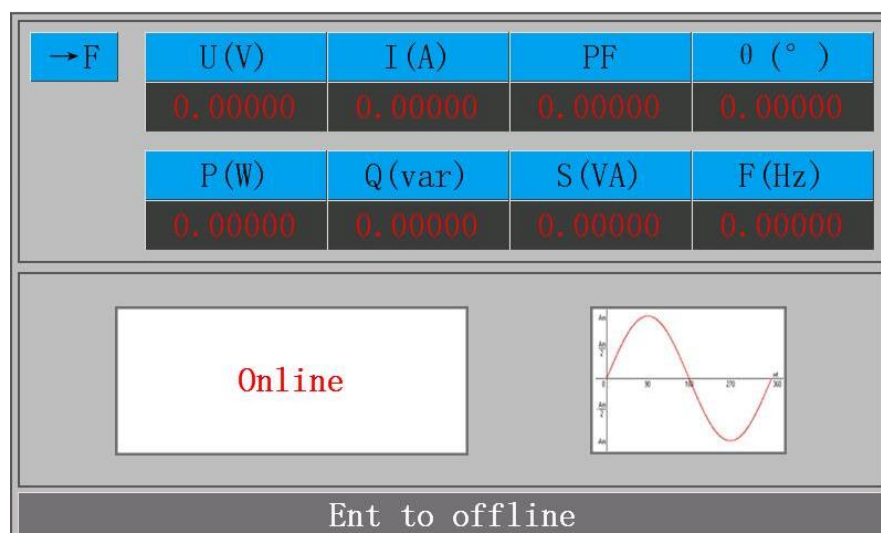


Figure 5.1.1 Online interface

“←” keyboard/offline;

“ESC” shut down the Source output;

Chapter 6 Reference Standard Energy Meter Instruction Manual

Refer to the reference standard energy meter instruction manual.

Chapter 7 Equipment Matching

1. 1 Single-phase portable watt-hour meter inspection device;
2. 1 Product certificate;
3. 1 Instruction manual;
4. 1 Test report;
5. 1 Packing list;
6. 1 Online line;
7. 3 Voltage lines
8. 1 Current short circuit lines;
9. 3 Pulse lines;
10. 3 Photoelectric sampler