WASITES

Instruction manual

AC electric parameter measuring instrument (harmonic type)

WT811

Foshan Huazhike Electronic Technology Co. , Ltd.

Introduction

Thank you for choosing our products. To ensure that users can use this product correctly, please read the product manual carefully before use. Check the packing list of this instruction sheet to confirm the products and accessories. If not, please contact our company or agent.

Points to note

1. This manual is to be used in conjunction with the instrument, and is subject to change without prior notice. 2. The contents of this manual have been confirmed to be correct, and the user has used the simplest way to express the user's understandability of the manual. If you find any error or unclear explanation, please contact our company or agent. Version: V1.0

Warning

For your personal safety and the correct use of this instrument, please comply with the requirements of this manual for operation and measurement, and pay strict attention to the following safety requirements. 1. Power supply and earthing protection, this product work power supply for AC86-265V power supply, before opening the power supply should ensure that the power supply and the rated voltage match, and ensure that the power supply has been connected to protect the earth wire, in order to prevent electric shock, the instrument shell has been connected to the power outlet Earth Terminal. 2. Please do not operate in an explosive environment, in order to avoid explosion caused personal injury. 3. Please do not open the case of the instrument, the instrument has a high voltage in some places to prevent electric shock. Four. It is not allowed to plug or unplug the terminals in case of electric shock. 5. If it is because of the equipment damage caused by the violation of the safety regulations, the company will not assume responsibility for the task.

1. Overview

The instrument adopts high-speed DSP processor and PLL to analyze the data, and the voltage and current are sampled by cryogenic bleaching resistor or high-precision transformer, so the sampled signal is not filtered, the stability and accuracy of the measured data are ensured. Measurement with true RMS. The instrument can measure voltage, current, power, power factor, frequency, voltage wave-to-peak ratio, current wave-to-peak ratio, also has harmonic analysis, serial communication and other functions. With perfect function, superior performance and simple operation, the instrument can meet the needs of high-speed measurement on the production site, as well as laboratory and R & D measurement.

Widely used in lighting appliances, power tools, household appliances, motors, electric appliances and other fields of production lines, laboratories, quality inspection departments.

According to the real demand can also customize a variety of measurement functions to meet the higher application.

AC electric parameter measuring instrument has the following characteristics:

1.The digital display, the reading is direct-viewing, uses the high-speed DSP processor + the phase-locked loop (PLL) to carry on the computation.

2.Multi-window display measurement voltage, current, power, power factor, frequency, voltage wave-to-peak ratio, current wave-to-peak ratio, also has harmonic analysis, measurement stability, fast measurement.

3.Phase-locked loop (PLL) synchronization method was used to analyze the harmonics up to 50 times.

4. The range of voltage and current can be changed automatically to improve the measuring precision.

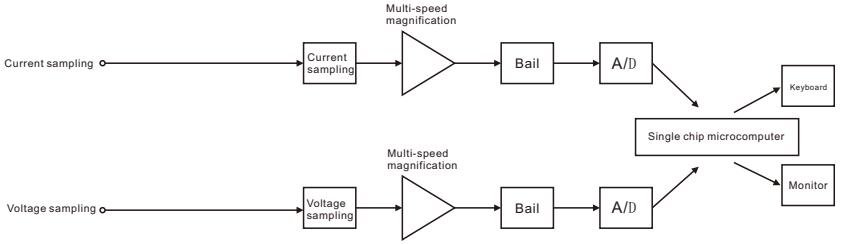
5. High reliability and long life.

6.With preset current, upper and lower limits of power, silencing, automatic judgment of whether the measured value exceeds the limit, and can set delay alarm, sound and light alarm indication, batch detection to improve efficiency.

7. With RS-232, RS485 serial communication interface, easy to communicate with the computer or PLC..

8.Addresses: 1-254, baud rate: 4800/9600,19200

2. Basic principles



Basic block diagram

As shown, the instrument consists of an analog part and a digital part. The analog part is mainly composed of sensor, multi-stage programmable amplifier, sample-and-hold, a/D circuit and so on. The digital part consists of a microcomputer data memory, keyboard and monitor. After the measured voltage signal passes through the voltage sensor, the signal is reduced to a weak signal. According to the signal size, the microcomputer is controlled to carry out program-controlled multi-range amplification, and through a sample-and-hold device, an analog-to-digital converter (ADC) converts the voltage signal into a digital signal and transmits the digital signal to the microcomputer, calculates the true effective voltage (URMS) and outputs the digital value to the display. After the measured current signal passes through the current sensor, the signal is converted into a weak voltage signal, which, like the measured voltage, is amplified, sampled and held, and converted into a/D by multi-stage program control, calculate the true effective voltage (IRMS) in the microcomputer and output the value to the display.

3. Technical specifications

Indicators \ Models	WT811
Voltage measurement range	3～600V(75V/150V/300V600V)(Automatic Range)
Current measurement range	0.005A～20A(0.5/2/8/20A)(Automatic Range)
Power measurement range	0.01～12KW
Power factor measurement range	-1.000～1.000
Frequency measurement range	Kibo 40-130Hz,Bandwidth 5KHz
Input impedance	Voltage greater than 5MΩ,The current is less than 0.02Ω
Continuous maximum allowed input	Voltage 700V,Current 24A
The maximum input is allowed	1000V,40A(Time1S)
Automatic range upgrade	The measured value exceeds about 110% of the rated range
Automatic range down gear	The measured value is below about 30% of the rated range
Measure update speed	Normal mode: about 2/s, harmonic mode: about 1/2 seconds
Sorting alarm function	With current, power setting upper and lower limit alarm function, alarm delay.

3. 1. Basic error

Project	Accuracy	Resolution
Voltage	±(0.3% Readings+0.1% Range+1 Word)	0.1
Current		0.001A
Power		0.01
Power factor	± (0.001/Readings+0.004+1 Word)	0.001
Frequency	± (0.1% Readings+1 Word)	0.1
Conditions	Within 12 months after calibration, temperature: 23 ± 5 ° C, Humidity: 30% -75% Rh, supply voltage: 220 ± 10 V, input waveform: sine wave, input frequency: 45 Hz to 65 Hz, common-mode voltage: 0 V DC, active power and power factor measurements, the voltage is 110V/220V/380V	

3.2.Harmonic measurement function

Method	Phase locked loop (PLL) synchronization method
Analyze the project	The relative values and effective values of the harmonic components of voltage and current, the relative values of voltage and current Total harmonic distortion, and the harmonic distortion are calculated by IEC.
Frequency Range	The fundamental frequency of PLL source is in the range of 45Hz ~ 65Hz
PLL source	The input signal is greater than or equal to 50% of the range
Accuracy	±(0.3% Range+5% Readings)
Number of times analyzed	1～50 Time
Harmonic display refresh rate	≈1 Time/2 Seconds

3. 3. General technical specifications

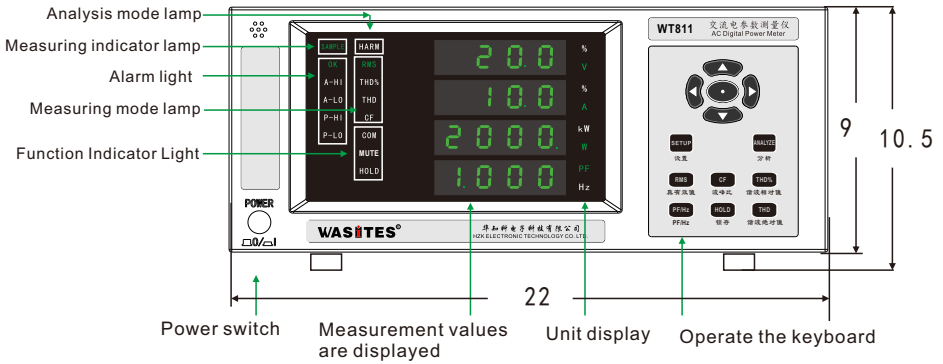
Warm-up time	≥30Minutes
Environment	5～40℃ ,20%～80%RH(No Dew)
Insulation	The insulation resistance between the signal input terminal, the housing and the power input terminal is greater than 10MΩ
Withstand pressure	1 minute withstand voltage AC2000V between signal input terminal and shell, signal input terminal and power input terminal, 1 minute withstand voltage DC2200V between shell and power input terminal
Operating voltage	86-265V±%10,50Hz/60Hz
Power consumption	≈3W
Size of chassis	252mmx116mmx385.5mm (WxHxD)
NET weight	≈4.0kg

3.4.Communication settings

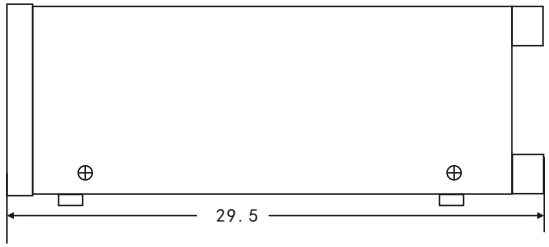
Communication interface	RS232 (DB9; 2Feet:TX、3Feet:RX、5Feet:GND) RS485 (DB9; 8Feet:A、9Feet:B)
Address	1-254
Baud rate	4800、9600、19200

4. Panel description

4. 1. Front and dimensions (CM)



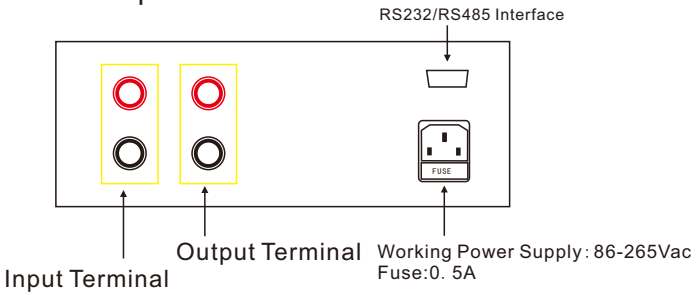
Side



Key	Lights	Description
Set+Key		Set voltage, current, power, power factor alarm value, alarm delay, communication address and baud rate, alarm sound setting. In harmonic mode, ∧ Increasing the number of times, ∨ A decreasing number of times.
Analysis	HARM	Enter the state of harmonic analysis, once again press the exit state of harmonic analysis.
True RMS	RMS	True RMS
Relative value of harmonics	THD%	Relative value of voltage and current Total harmonic distortion harmonic distortion
Absolute value of harmonic	THD	Absolute value of voltage and current Total harmonic distortion harmonic distortion
PF/Hz	PF、Hz	Switching power factor PF, frequency Hz
Latch	HOLD	Press the lock key, the HOLD light turns on, press it again to release the lock.
Peak to peak ratio	CF	Voltage/current wave peak ratio
Function Indicator Light	COM, MUTE, HOLD	COM communication light, MUTE light, HOLD lock light

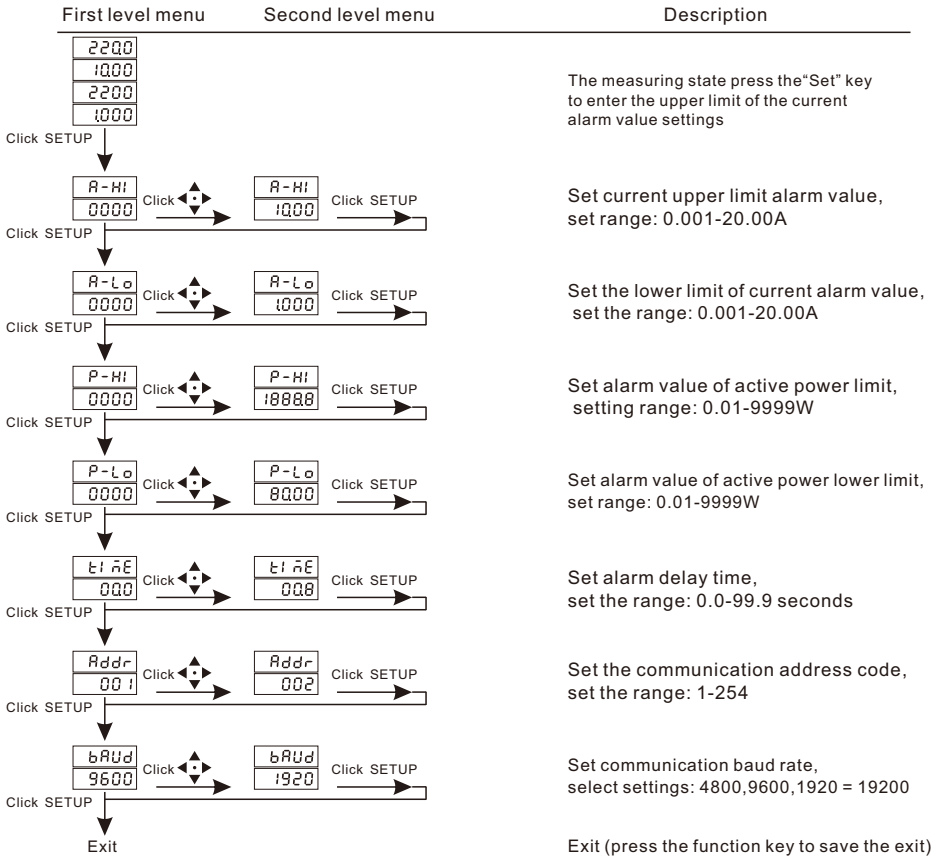
	Key	Description
The menu sets the button instructions	SETUP	Enter setup and setup confirmation
	∧	The number of harmonics increases with the increase of numerical value
	∨	The numerical value decreases, and the harmonic frequency decreases in the harmonic mode
	<	The cursor moves to the left
	>	The cursor moves to the right
	.	Decimal Point Displacement, in the measurement mode for the "Mute" button.

4. 3. Pattern of back panel



Components	Functional description.
Input Terminal	The input terminal of the measured power supply.
Output Terminal	The output is connected to the load end.
RS232/RS485 Interface	RS232 (DB9; 2:TX、3:RX、5:GND) RS485(DB9;8:A,9:B)
Working Power Supply	Working Power Supply: 86-265Vac Fuse:0. 5A

5. Menu action



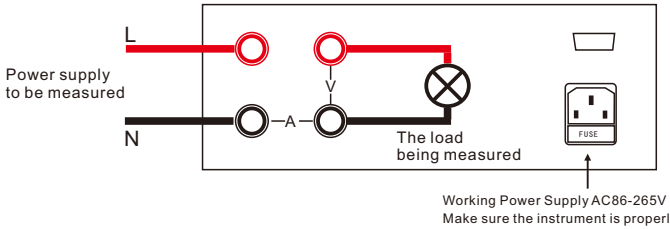
6. Operation Instructions

Measure wiring according to the following diagram wiring

Choose enough connecting wire according to the load current (the load current flows along the thick wire in the figure above) to avoid too much resistance of the wire, causing additional measurement error, and possibly causing the wire to heat up, dangerous. The wire should be as short as possible and should be as far away from the instrument enclosure as possible.

In wiring, should let the wire and terminal contact between good, contact surface as large as possible, and should tighten the terminal. Do not detach the wire from the terminal or make the wire contact with the instrument behind, so as to avoid danger.

In the measured voltage or current has high-frequency components, or measuring large current, wiring should be aware of possible interference and noise, affect the measurement accuracy.
In order to ensure the stability and accuracy of measuring current, it is necessary to add voltage signal at the voltage end.



7. Turn on the measurement

First plug in the power outlet on the back panel of the instrument, and use the specified instrument power supply voltage, the power outlet should be with ground wire. After checking the wiring is correct, turn on the instrument switch located in the front panel of the instrument, the instrument into a measuring state. Power on the load, and so on after the load is stable, the instrument can be read from the front panel of the display on the required measurement values. Note: the instrument should be preheated for 30 minutes before putting into a stable state. After cutting off the power supply of the instrument, it should wait more than 10 seconds before turning on the power again. It is strictly forbidden to switch the power supply repeatedly in a short period of time. This will shorten the life of the instrument, and may cause instrument failure. When the measurement is finished, turn off the power, and unplug the plug to prevent possible lightning damage to the instrument.

8. Measurement mode

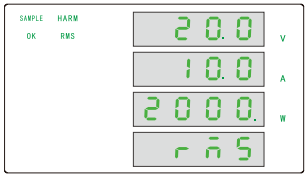
8.1. General measurement mode.

In the upper left corner, “Harm” is not shown as normal mode, “RMS” is the true measurement state, which can accurately measure and display the value of its alternating current parameter, and “CF” is the peak measurement state, can accurately measure and display its load voltage and current wave-to-peak ratio, power and frequency, power factor.

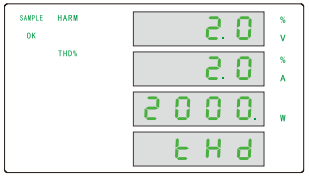
8.2. Harmonic measurement mode.

Press the “ANALYZE” key, the top left corner “Harm” shows, select enter the harmonic analysis measurement mode, press the key again, exit the analysis mode.

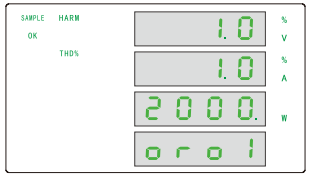
You can also enter analysis mode in normal mode by pressing the “THD% or THD” key. It reads as follows:



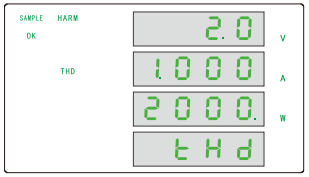
Press“RMS” to enter the true RMS measurement.



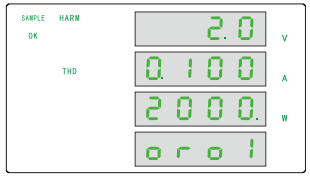
According to“Thd%” into the voltage and current total harmonic relative value measurement.



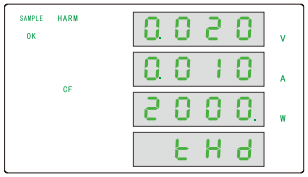
Press“∧,∨”select the relative value of the measured harmonics.



Press“THD” to measure the relative value of the total harmonic of the entry voltage and current.



Press“∧,∨”select measure each harmonic absolute value.



According to“THD” enter voltage current peak ratio measurement.

9. Sorting function

During the inspection of finished products on the production line, it is necessary to test a large number of finished products with the same specifications to judge the quality of the batch. In order to improve the testing efficiency, a certain range can be set in the instrument to judge whether the product is qualified or not, which eliminates the operator's reading and judgment, reduces the operator's work and greatly improves the testing efficiency, this is the sorting function of the instrument.

In order to get the correct sorting results, it is necessary to set the correct parameters of the instrument. (detailed setting see menu operation diagram)

If the test value of the corresponding item is greater than or less than the upper limit of the set value, it means that the measured item is not qualified, and the buzzer also makes a sound.

The upper limit must be larger than the lower limit to normal alarm, when the upper limit and lower limit value is the same, side does not participate in the alarm.

When the measured value is zero, the instrument does not judge the upper and lower limits of power.

10. Common trouble shooting

Common failure and handling

Serial number	Phenomenon	Measures
1	After boot, the instrument window does not display	1.Make sure the instrument power cord is connected properly. 2. Make sure the power supply is within the allowed range.
2	The displayed measurements are not accurate	1. Ensure that the working environment temperature and humidity within the allowable range. 2. Make sure the display is not disturbed by noise. 3. Check that the test line is connected properly. 4.Check that the wiring is set correctly. 5.The data shows whether it is in a latched state. 6. Reboot.
3	Key Operation Invalid	1.Check if any other buttons are stuck.
4	Communication failure	1.Check if the communication line is connected properly, (whether the TX/RX or A/B signal corresponds) . 2. Check if the address and communication mode of the instrument correspond to the host computer.

Other details can be found in each chapter.

11. Calibration and calibration

The jumper between the terminals on the back of the tested instrument should be removed. The accuracy of the standard meter should be one grade higher than that of the tested meter, and the standard source should have sufficient stability.

After all the instruments and equipment are powered up for 15 minutes, slowly adjust the voltage or current output of the standard AC source, watch the standard meter read to the desired value, after the data is stabilized, record the data of the standard meter and the examined meter, and calculate the base value, judge whether it conforms to the error range.

Verification conditions

Project	A reference value or range	A reference value or range
Ambient temperature℃	25	±5
Ambient humidity%RH	45～75	
Atmospheric pressure KPa	86～106	
AC supply voltage V	220	±2%
AC supply voltage Hz	50	±1%
AC power supply waveform	Sine wave	ß=0.05
External electromagnetic field interference	Should be avoided	
Ventilation	Good	
The sun shines	Avoid the sun	

Note: The inspection equipment used should conform to the specifications for periodic measurement and verification.

Packing list

Equipment	1PCS
Power Cord	1PCS
Instructions	1PCS
Certificate/Warranty card	1PCS

Warranty

The warranty period is 1 year from the date of purchase. If the instrument is damaged due to user's improper operation during the warranty period, the maintenance cost and the cost caused by the maintenance shall be borne by the user. Without the company's written consent, the user can not open the instrument shell, which will affect the instrument warranty. The instrument maintenance should be carried out by the professional and technical personnel authorized by our company. Please don't change the internal parts of the instrument without authorization. If the user blindly maintenance, replacement of instrument components caused by instrument damage, does not fall within the scope of warranty, the user should bear the cost of maintenance. The company has the right to improve the appearance and function of the manual and instrument without prior notice.

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