



**NINGBO JIANAN ELECTRONICS CO., LTD.**

Address: #711, Keji road, Cixi, Ningbo, China. P.C. 315300

Tel: +86 574-23669188

Fax: +86 574-23670886

Website: [www.nb-jianan.com](http://www.nb-jianan.com)

E-mail: nbjn@nb-jianan.com

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DDSF149 2P3W Electronic Energy Meter

# User's Manual



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## 1. Overview

DDSF149 2P3W Electronic Energy Meter (hereinafter referred to as the “meter”) consists of electronic energy meter unit and data processing unit. The meter has a high measuring accuracy, good stability, strong overload capacity, high reliability advantages. It is designed according to IEC62052-11, IEC62053-21.

## 2. Specification

| Accuracy class and constant<br>Specification |            | active power class 1.0<br>(constant imp/kWh) |
|----------------------------------------------|------------|----------------------------------------------|
| 2×127/220V                                   | 2×10(100)A | 1000                                         |
| 2×120/240V                                   | 2×10(100)A | 1000                                         |

Remarks: it can be designed according to client's requirements.

## 3. Main Electrical Specification

### 3.1 Intrinsic error :( see table)

| Current                   | active power class 1.0 |         |
|---------------------------|------------------------|---------|
|                           | power factor COSΦ      | error % |
| $0.05I_b \leq I < 0.1I_b$ | 1.0                    | ±1.5    |
| $0.1I_b \leq I < I_{max}$ | 1.0                    | ±1.0    |
| $0.1I_b \leq I < 0.2I_b$  | 0.5lagor 0.8advanced   | ±1.5    |
| $0.2I_b \leq I < I_{max}$ | 0.5lagor 0.8advanced   | ±1.0    |

**3.2 Starting current:** under the condition of reference voltage, reference frequency and power factor is 1, the meter should be able to start and continuous recording when load current is  $0.004I_b$ .

**3.3 Creeping:** plus115%  $U_n$  on voltage lines, output impulse is not more than 1pcs when current circuit without current

### 3.4 Climatic conditions



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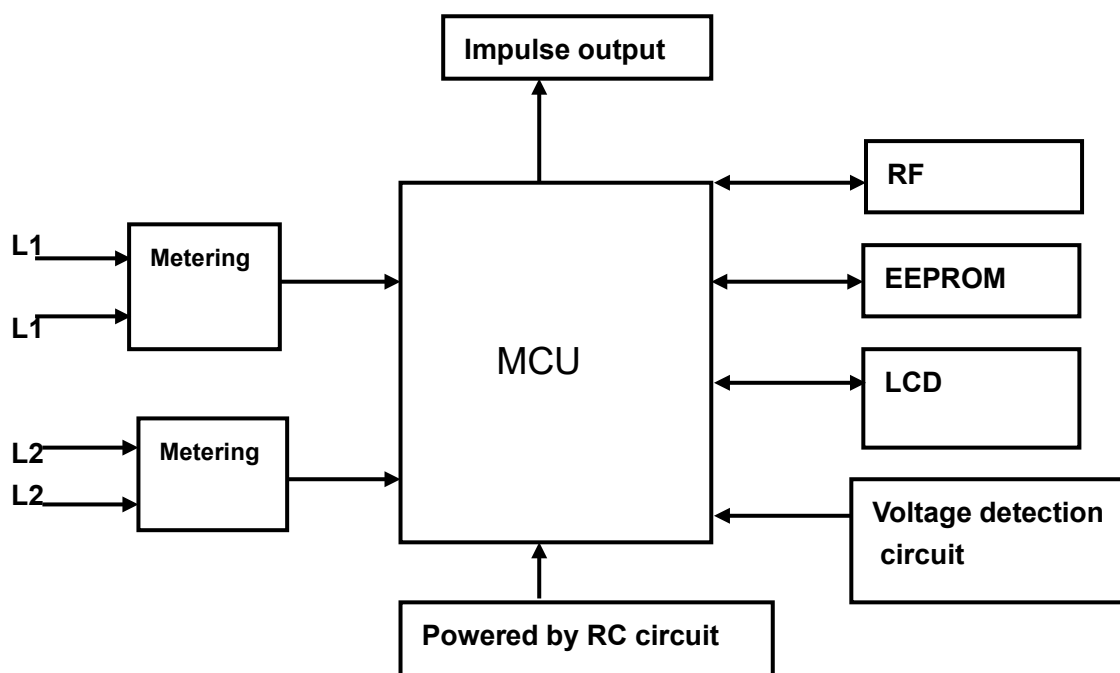
|                                        |             |
|----------------------------------------|-------------|
| Normal working temperature             | -25℃ ~ +55℃ |
| Limit working temperature              | -40℃ ~ +70℃ |
| Storage and transportation temperature | -40℃ ~ +70℃ |

**3.5 Overall Dimensions:** 157×132×70 mm

### 3.6 Safety performance:

Insulation AC voltage test: Insulation voltage 4kV, impulse voltage 6 kV, EMC test passed, meter will not destroy for 4 hours in 1.9Un.

## 4. Product principle



Specify as below:

**4.1 Energy metering:** MCU use V9811S with Vango brand, collect high impulse which Metering chip generated. According to the sampling time, calculate the corresponding power, meanwhile according to impulse constant, converted to power impulse. According to the collected pulse count, metering 0.01kWh impulse count, energy plus 0.01kwh.



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### 4.2 Power: RC supply

## 5. Main function

### 5.1 Metering

5.1.1 Metering forward and reverse active power.

5.1.2 Metering forward and reverse reactive power.

5.1.3 TOU measuring, store forward and reverse active energy (T1, T2, T3, T4 consumption)

5.1.4 Store last 12months total energy and each tariff active energy. Data storage for the monthly settlement.

### 5.2 Maximum demand

5.2.1 Measuring positive active maximum demand, the occurrence date and time

5.2.2 Storing last 12months settlement interval maximum demand data.

### 5.3 Clock

5.3.1 With temperature compensation. At -25°C~+60°C range, clock accuracy  $\leq \pm 1\text{s/d}$ ; reference temperature  $< 23^\circ\text{C}$ , clock accuracy  $\leq \pm 0.5\text{s/d}$

5.3.2 Automatic conversion between Calendar, timing and leap year.

### 5.4 Multi-rate

5.4.1 4 tariff, T1, T2, T3, T4.

5.4.2 Set 4 time segment in 24hour, time can cross zero setting

### 5.5 Event records

5.5.1 Power failure: record the total times and cumulative time of power failure events, and last 10 times of end time.

5.5.2 L1 Phase failure: record the total times and the cumulative time of L1 phase failure events, and last 10 times of end time.

5.5.3 L2 Phase failure: record the total times and the cumulative time of L2 phase failure events, and last 10 times of end time

5.5.4 Power Reverse Event: record the total times of power reverse events, and last 10 times of occurrence time and end time.

5.5.5 Unauthorized attempts: record the total times of unauthorized attempts, and last 10 times of occurrence time.

5.5.6 Demand reset: record the total times of demand reset, and last 10 times of occurrence time.

5.5.7 Time synchronization: record the total times of time synchronization and last 10



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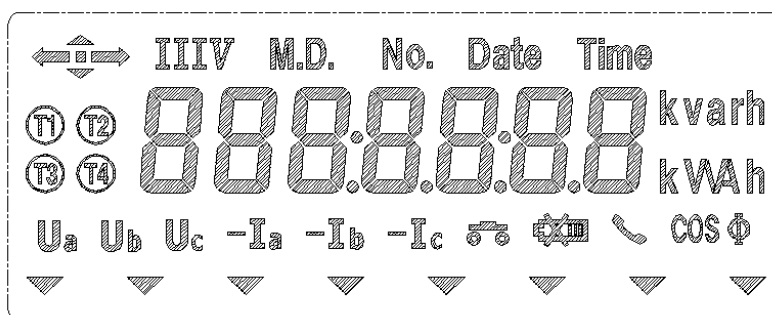
times of occurrence time.

5.5.8 Low battery: record the total times of low battery, and last 10 times of occurrence time.

5.5.9 Memory error: record the total times of memory error, and last 10 times of occurrence time.

## 5.6 Display

5.6.1 LCD self-checking 5s after power on. Display as below



5.6.2 Power on display: default “automatic cycle display”, display items and interval time can be set up, number of display items at most 10.

5.6.3 Failure power display: default “ power energy”. Display time can be set ( from 1-24 hours), LCD will be closed when exceed set time.

5.6.4 Below display items available.

| Display items                             | Display content  |
|-------------------------------------------|------------------|
| current total active power energy         | XXXXXX.XX kwh    |
| Current TOU1 active power energy          | XXXXXX.XX kwh T1 |
| Current TOU2 active power energy          | XXXXXX.XX kwh T2 |
| Current TOU3 active power energy          | XXXXXX.XX kwh T3 |
| Current TOU4 active power energy          | XXXXXX.XX kwh T4 |
| current total forward active power energy | XXXXXX.XX kwh    |
| Current TOU1 forward power energy         | XXXXXX.XX kwh T1 |
| Current TOU2 forward power                | XXXXXX.XX kwh T2 |



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| Display items                             | Display content  |
|-------------------------------------------|------------------|
| energy                                    |                  |
| Current TOU3forward power energy          | XXXXXX.XX kwh T3 |
| Current TOU4 forward power energy         | XXXXXX.XX kwh T4 |
| current total reverse active power energy | XXXXXX.XX kwh    |
| Current TOU1 reverse power energy         | XXXXXX.XX kwh T1 |
| Current TOU2 reverse power energy         | XXXXXX.XX kwh T2 |
| Current TOU3 reverse power energy         | XXXXXX.XX kwh T3 |
| Current TOU4 reverse power energy         | XXXXXX.XX kwh T4 |
| Date                                      | YY.MM.DD Date    |
| Time                                      | Hh:mm:ss Time    |
| Current L1 voltage                        | XXX.X v I        |
| Current L2 voltage                        | XXX.X v II       |
| Current L1 current                        | XX.XXXX A I      |
| Current L2 current                        | XX.XXX A II      |
| Current L1 power                          | XX.XXXX kw I     |
| Current L2 power                          | XX.XXXX kw II    |
| Current maximum demand                    | XX.XXX kw M.D.   |

## 5.6.5 LCD symbol illustration

| No. | symbol    | illustration         |
|-----|-----------|----------------------|
| 1   | Date Time | (1) Date<br>(2) Time |



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|   |  |                                                              |
|---|--|--------------------------------------------------------------|
| 2 |  | Data and measurement unit                                    |
| 3 |  | L1 phase failure indicator<br>L2 phase failure indicator     |
| 4 |  | L1 current inverse indicator<br>L2 current inverse indicator |
| 5 |  | Power factor                                                 |

### 5.7 Indicator

5.7.1 LED indicator with high-bright and long-life, function as below:

- (1) Impulse indicator: impulse output indicate
- (2) Reverse indicator: reverse occurs flashing, otherwise dark.
- (3) L1 Phase failure alarm: flashing when phase failure happened, otherwise dark
- (4) L2 Phase failure alarm: flashing when phase failure happened, otherwise dark

### 5.8 Interface output

5.8.1 Impulse output interface also can be used for time synchronization or impulse collect, width of impulse output interface is 80±20MS.

## 6. Overall specification and installation

### 6.1 Dimension (MM)

Please see the external photos of the product



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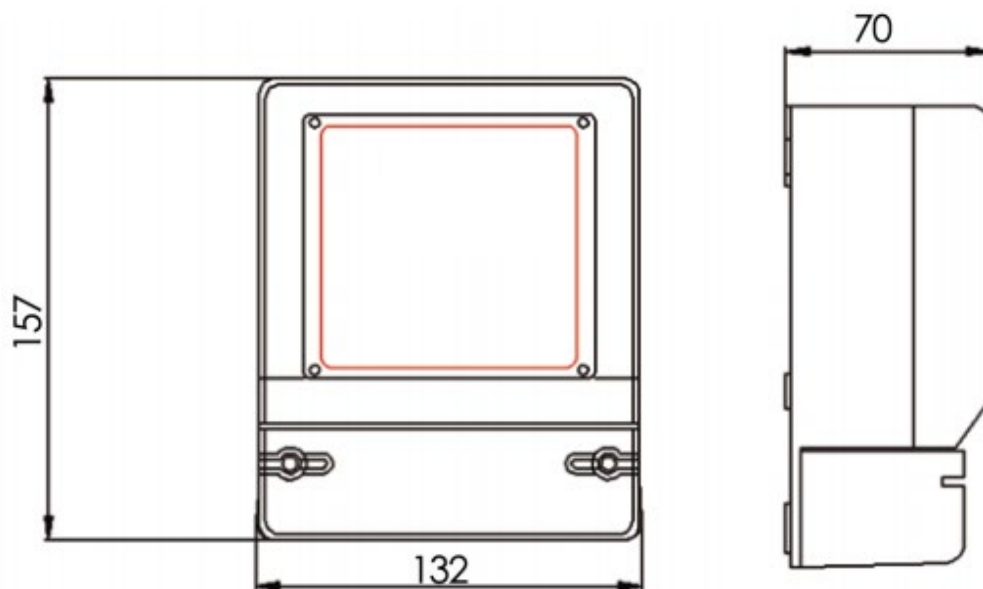
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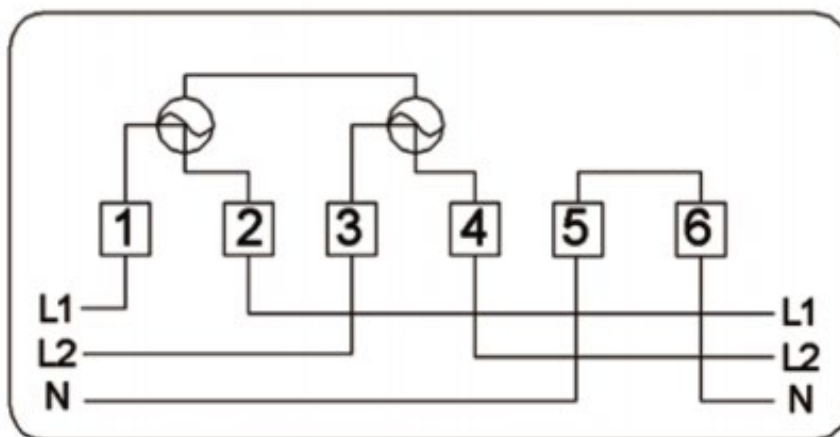
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### 6.2 Wiring diagram



### 6.3 Installation

It is forbidden to install lines on charged state.

Meters should be installed indoor; it must protected by meter box when installing outdoor.

Install base plate should be fixed on the metope of strong refractory and not easy to vibration. It is better that no corrosive gas in the air, avoiding dust and salt, dust in



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installation environment.

Connection must strictly according to wiring diagram, material of lead line should be copper wire, screws must be tightened in terminal block, avoid meter burned due to poor connection.

### 7. Transportation and storage

Meters must storage and transportation under the condition of the original packaging. Meter could not be impacted when transportation and seal off. Storage in warehouse and put on the shelf; stacked height shall not exceed five layers. Storage environment could not have corrosive gas.

### 8. Guarantee and service

In comply with the provisions of this specification of transportation, storage, installation, operation specification requirement, meanwhile seal is complete, if any quality problem, Our company is responsible for free repair or replacement in 12months from delivery date. Our company supply repairment and service in product life cycle; Responsible for providing equipment wiring diagram and the necessary technical documents and drawings and so on.

According to the requirement of users, make necessary training, and provide training material, to regularly update and provide software upgrade freely.

Our company will reply calling or email in 24 hours after received service requirements in product.

### 9. Warning section:

#### FCC

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this



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device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### 10. Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.



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## Function list

| OBIS    | Content                                                |                      | Function |       | Bytes |
|---------|--------------------------------------------------------|----------------------|----------|-------|-------|
|         |                                                        |                      | read     | write |       |
| 0.9.1   | Time                                                   | HHmmss               | *        | *     | 3     |
| 0.9.2   | Date                                                   | YYMMDD               | *        | *     | 3     |
| 0.9.4   | cycle display time                                     | XX                   | *        | *     | 1     |
| 1.8.0   | Current forward active energy                          | (XXXXXX.XX)          | *        |       | 4     |
| 1.8.1   | Current forward active energy in tariff 1              | (XXXXXX.XX)          | *        |       | 4     |
| 1.8.2   | Current forward active energy in tariff 2              | (XXXXXX.XX)          | *        |       | 4     |
| 1.8.3   | Current forward active energy in tariff 3              | (XXXXXX.XX)          | *        |       | 4     |
| 1.8.4   | Current forward active energy in tariff 4              | (XXXXXX.XX)          | *        |       | 4     |
| 2.8.0   | Current reverse active energy                          | (XXXXXX.XX)          | *        |       | 4     |
| 1.6.0   | (Current) Max. demand and occurrence time              | (XXXXXXXXYYMMDDHHmm) | *        |       | 8     |
| 1.6.0*1 | (last settlement date) Max. demand and occurrence time | (XXXXXXXXYYMMDDHHmm) | *        |       | 8     |



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| OBIS    | Content                                                  |                     | Function |       | Bytes |
|---------|----------------------------------------------------------|---------------------|----------|-------|-------|
|         |                                                          |                     | read     | write |       |
| 1.6.0*2 | (last 2 settlement date) Max. demand and occurrence time | (XXXXXXXXYMMDDHHmm) | *        |       | 8     |
| 1.6.0*3 | (last 3 settlement date) Max. demand and occurrence time | (XXXXXXXXYMMDDHHmm) | *        |       | 8     |
| 1.6.0*4 | (last 4 settlement date) Max. demand and occurrence time | (XXXXXXXXYMMDDHHmm) | *        |       | 8     |
| 0.0.0   | meter number                                             | XXXXXXXXXXXX        | *        | *     | 6     |
| 32.7.0  | L1 phase voltage                                         | XXX.XV              | *        |       | 2     |
| 31.7.0  | L1 phase current                                         | XXX.XXXA            | *        |       | 3     |
| 52.7.0  | L2 phase voltage                                         | XXX.XV              | *        |       | 2     |
| 51.7.0  | L2 phase current                                         | XXX.XXXA            | *        |       | 3     |
| 21.7.0  | A phase active power                                     | XX.XXXXkw           | *        |       | 3     |
| 41.7.0  | B phase active power                                     | XX.XXXXkw           | *        |       | 3     |