

# **Multifunction Power Meter User Manual**

**This manual is applied to the following models:  
LNF53**

**JIANGSU SFERE ELECTRIC CO., LTD.**

# 1. Product description

## 1.1 Overview

LNF53 multifunction power meter can measure all electrical parameters and bi-directional electric energy, with functions such as communication and energy pulse output. The instrument adopts ultra-thin design and is easy to be installed. As an advanced intelligent and digital grid front-end acquisition component, it can be applied for power monitoring systems and energy management systems to realize power data collection.

## 1.2 Model selection

|                              |  | LNF53 |
|------------------------------|--|-------|
| <b>Real-time measurement</b> | U/I/P/Q/S/PF/F   | ■     |
|                              | Demand   | ■     |
| <b>Energy metering</b>       | Bi-directional energy  | ■     |
|                              | Four-quadrant reactive energy                                | ■     |
| <b>Power quality</b>         | Sequence component and phase position of voltage and current | ■     |
|                              | Voltage and current unbalance                                | ■     |
| <b>Input and output</b>      | <b>Input and output</b>                                      | ■     |
|                              | RS485 communication interface                                | ■     |
| <b>Appearance dimension</b>  | Display mode   | LCD   |
|                              | Panel size(mm)   | 72×72 |

Note: “■” indicates that this function is available.

## 2. Technical parameters

### 2.1 Technical specification

| <b>Working environment</b>  |   |
|-----------------------------|---|
| Working temperature         | -10°C -- 55°C   |
| Storage temperature         | -25°C -- 70°C   |
| Relative humidity           | ≤95% RH, no condensation  |
| Working altitude            | ≤2500m  |
| Anti-pollution level        | Non-corrosive gas   |
| Protection degree           | Front case IP54, rear case IP20.  |
| Insulation                  | Between signal, power supply, output terminal to case resistance >100MΩ             |
| Withstand voltage           | Input and power supply ≥ 2kV, input and output ≥ 2kV, power supply and output ≥ 2kV |
| <b>display</b>              |   |
| Display method              | LCD   |
| <b>Working power supply</b> |   |
| Rated range                 | AC/DC (80~270) V  |
| Power consumption           | ≤5VA  |
| Withstand voltage           | ≥2kV  |
| <b>Voltage input</b>        |   |
| Range                       | 3×230/400V  |
| Resolution                  | 0.1 V   |
| Impedance                   | ≥1.7 MΩ/ per phase  |
| Power consumption           | ≤0.1 VA / per phase   |
| Overload                    | Continuous:1.2Vn<br>Instantaneous: 2Vn/1min   |
| Frequency                   | 45 Hz-65 Hz   |
| <b>Current input</b>        |   |
| Range                       | 3×5A/1A   |

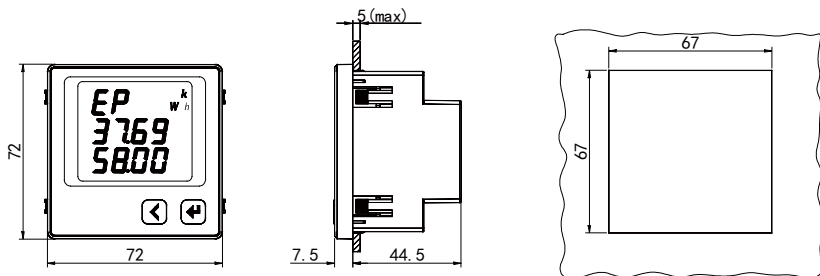
|   |  |
|---|--|
| Resolution  | 1mA  |
| Impedance   | ≤20mΩ/ per phase                             |
| Power consumption   | ≤0.2 VA/ per phase                           |
| Overload  | Continuous:1.2Vn<br>Instantaneous: 10In/5s   |
| <b>Energy pulse output</b>  |  |
| Pulse width   | 80ms±20%                                     |
| Max. terminal voltage   | 35V  |
| Max. terminal current   | 10mA   |
| Pulse frequency   | ≤10Hz  |
| Output object   | Import active energy, import reactive energy |
| <b>Communication interface</b>  |  |
| Physical interface  | RS-485                                       |
| Communication speed   | Up to 9.6 kbps                               |
| Communication protocol  | Modbus-RTU                                   |
| Isolation voltage   | 2000 VAC (1 min)                             |
| <b>Electromagnetic compatibility</b>                                  |  |
| Electrostatic discharge immunity                                      | IEC 61000-4-2-III                            |
| Radiated, radio-frequency, electromagnetic field immunity             | IEC 61000-4-3-III                            |
| Electrical fast transient/burst immunity                              | IEC 61000-4-4-IV                             |
| Impact (surge) immunity   | IEC 61000-4-5-IV                             |
| Immunity to conducted disturbances, induced by radio-frequency fields | IEC 61000-4-6-III                            |
| Power frequency magnetic field immunity                               | IEC 61000-4-8-III                            |
| Voltage dips, short interruptions and voltage variations immunity     | IEC 61000-4-11-III                           |

## 2.2 Measurement parameter

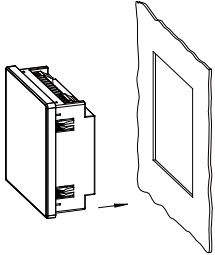
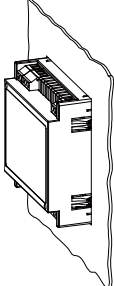
| Measurement variable | Accuracy | Instant | Demand | Sum | Unit             |
|----------------------|----------|---------|--------|-----|------------------|
| V1/V2/V3             | 0.2      | ●       | —      | —   | [V,kV]           |
| U12/U23/U31          | 0.2      | ●       | —      | —   | [V,kV]           |
| I1/I2/I3             | 0.2      | ●       | ●      | —   | [A,kA]           |
| F                    | ±0.01Hz  | ●       | —      | —   | [Hz]             |
| P1/P2/P3             | 0.5      | ●       | —      | —   | [kW,MW,GW]       |
| P                    | 0.5      | ●       | ●      | —   | [kW,MW,GW]       |
| Q1/Q2/Q3             | 0.5      | ●       | —      | —   | [kvar,Mvar,Gvar] |
| Q                    | 0.5      | ●       | ●      | —   | [kvar,Mvar,Gvar] |
| S1/S2/S3             | 0.5      | ●       | —      | —   | [kVA,MVA,GVA]    |
| S                    | 0.5      | ●       | ●      | —   | [kVA,MVA,GVA]    |
| PF1/PF2/PF3          | 0.5      | ●       | —      | —   | —                |
| PF                   | 0.5      | ●       | —      | —   | —                |
| EP+/EP-              | 0.5S     | —       | —      | ●   | [kWh,MWh]        |
| EQ+/EQ-              | 2        | —       | —      | ●   | [kvarh,Mvarh]    |
| EQ1/EQ2/EQ3/EQ4      | 2        | —       | —      | ●   | [kvarh,Mvarh]    |

## 3. Installation

### 3.1 Dimension



### 3.2 Installation

|  |   |
|--|---|
|  A technical line drawing showing a rectangular meter with a multi-pin connector on its top surface. An arrow points from the meter towards a rectangular opening in a panel, indicating the direction of insertion.                                    | <p><b>Install the meter from the outside of the panel into the mounting hole.</b></p> |
|  A technical line drawing showing the meter fully inserted into the panel. The meter's top surface is flush with the panel's surface. A small component, likely a snap spring, is shown at the bottom of the meter's housing, securing it to the panel. | <p><b>Install it to the end and fix the meter with a snap spring.</b></p>             |

### 3.3 Wiring

