# Multifunction Power Meter

# User Manual

Applied to：

SDT13R

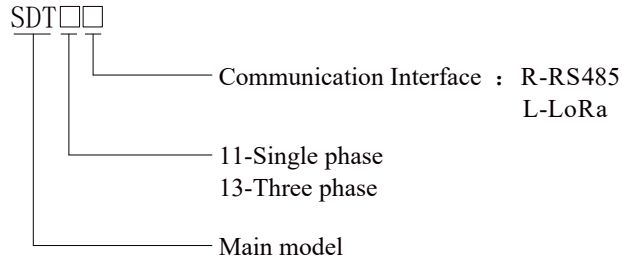
**JIANGSU SFERE ELECTRIC CO., LTD**

## 1. Product introduction

### 1.1 Overview

Puncture-mounted power meters can measure single-phase or three-phase loop power grid parameters, including voltage, current, power, frequency, energy, demand, limits, total harmonic distortion, 2-31 harmonic content, voltage and current imbalance and other parameters. The meter adopts the open current transformer access method, which supplies power to the entire instrument and measures the full power parameter through the puncture method. The product can be installed without interrupting power. The instrument communication can use LoRa wireless or RS-485 interface, and the communication protocol adopts ModBus-RTU Protocol.

### 1.2 Model Selection




| Model | Three phase |
|---|---|
| | SDT13R |
| V/A/F/P/Q/S/PF | ● |
| Neutral current | ● |
| Demand / Limits / Average | ● |
| Load rate | ● |
| THD | ● |
| 2 - 31 harmonic content | ● |

| | |
|---|---|
| Voltage/current imbalance | ● |
| Voltage/frequency deviation | ● |
| Phase angle | ● |
| Bidirectional energy | ● |
| Tariff energy | ● |
| Temperature | ● |
| Max./min. value record | ● |
| Data freezing | ● |
| LoRa communication interface | - |
| RS485 communication interface | ● |

# 2 Technical specification

## 2.1 Technical parameter

| | |
|---|---|
| Working environment conditions | |
| Operating temperature | -10°C -- 55°C |
| Storage temperature | -25°C -- 70°C |
| Relative humidity | ≤95%RH，non-condensing |
| Working altitude | ≤2500m |
| Antifouling level | No corrosion gas |
| Protection grade | Panel IP54，case IP20 |
| Insulation | Resistance of the signal, power and output terminal to the shell is >100MΩ |
| Withstand voltage | Input and power supply≥2kV， input and output≥2kV， power supply and output≥2kV |
| **Working power supply** | |
| Nominal range | AC/DC（80～270）V |
| Consumption | ≤5VA |
| Withstand voltage | ≥2kV |
| Voltage input | |
| Range | 3×230/400V |

| | | |
|---|---|---|
| Resolution | 0.1 V | |
| Impedance | ≥1.7 MΩ/phase | |
| Consumption | ≤0.1 VA /phase | |
| Overload | Continuous：1.2Vn，Instantaneous：2Vn/10s | |
| Frequency | 45-65 Hz | |
| Current input | | |
| Range | 50（600）A | |
| Resolution | 1 mA | |
| Impedance | ≤20mΩ/phase | |
| Consumption | ≤0.2 VA /phase | |
| Overload | Continuous：1.2In, Instantaneous：10In/5s | |
| **Energy pulse output** | | |
| Pulse width | 80ms±20% | |
| Port maximum voltage | 35V | |
| Port maximum current | 10mA | |
| Pulse frequency | ≤10Hz | |
| Output object | Import active energy, import reactive energy | |
| **Communication interface** | | |
| Physical interface | RS-485 | LoRa |
| Baud rate | Up to 9600bps | Up to 9600bps |
| Communication protocol | Modbus-RTU | Modbus-RTU |
| Insulation voltage | 2000 VAC (1 min) | -- |
| **Electromagnetic compatibility** | | |
| Electrostatic discharge immunity | Level IEC 61000-4-2-III | |
| Radiated susceptibility | Level IEC 61000-4-3-III | |
| Electrical fast transient pulse immunity | Level IEC 61000-4-4-IV | |
| Shock (surge) noise immunity | Level IEC 61000-4-5-IV | |
| Conducted interference noise immunity of radio frequency field induced conduction | Level IEC 61000-4-6-III | |
| Power frequency magnetic field immunity | Level IEC 61000-4-8-III | |
| Voltage sag and short interruption immunity | Level IEC 61000-4-11-III | |

**2.2 Measurement parameters**

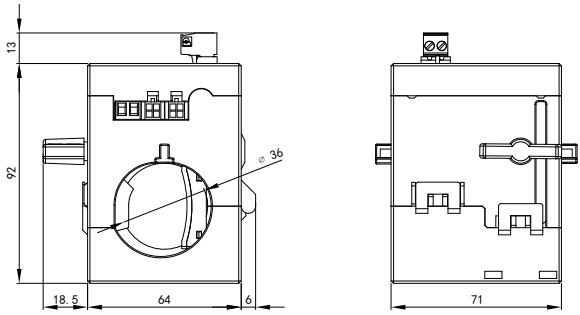
The following table lists the correlation variable that can be measured, including basic electrical quantities and further calculations.

| Measurement function | Accuracy level | Real-time | Limits | Demands | Average |
|---|---|---|---|---|---|
| Voltage | 0.5 | ● | ● | — | ● |
| Current | 0.5 | ● | ● | ● | ● |
| Frequency | ±0.01Hz | ● | ● | — | |
| Split-phase active power | 1 | ● | ● | ● | |
| Total active power | 1 | ● | ● | ● | |
| Split-phase reactive power | 1 | ● | ● | — | |
| Total reactive power | 1 | ● | ● | — | |
| Split-phase apparent power | 1 | ● | ● | — | |
| Total apparent power | 1 | ● | ● | — | |
| Split-phase power factor | 1 | ● | ● | — | |
| Total power factor | 1 | ● | ● | — | |
| Demands | | | | | |
| Total harmonic distortion rate | Level B | ● | | | |
| 2-31 harmonic content | Level B | ● | | | |
| Voltage imbalance | | ● | | | |
| Current imbalance | | ● | | | |
| Voltage deviation | | ● | | | |
| Frequency deviation | | ● | | | |
| Phase angle | | ● | | | |
| Import/export active energy | 1 | ● | — | — | |
| Import/export reactive energy | 2 | ● | — | — | |
| Tariff energy | 1 | ● | — | — | |
| Puncture point temperature | ±2℃ | — | — | — | |

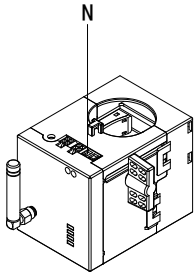
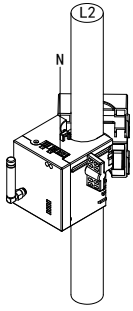
**Notes: "●" Yes; "-" No.**

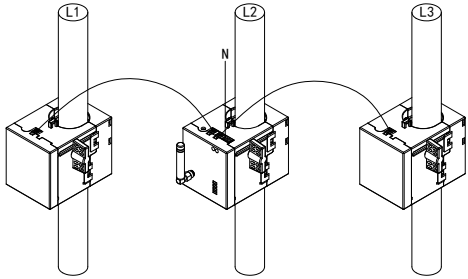
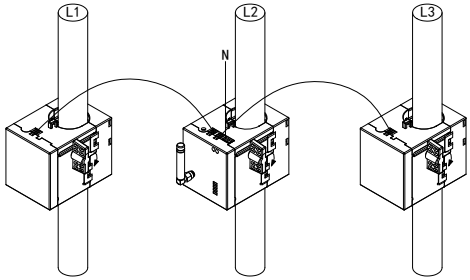
## 3. Installation and wiring

### 3.1 Dimensions

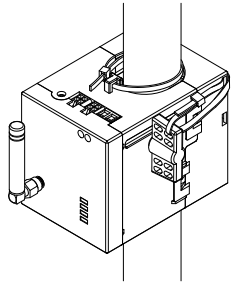



### 3.2 Installation

| | | |
|---|---|---|
| 1 |  | Connect the N line to the Un wiring hole of the puncture transformer, and tighten the N line wiring hole fastening screws. |
| 2 |  | Open the puncture transformer, and connect the SDT13 to the L2-phase cable and close the transformer and tighten screws. If the cable diameter is small, the cable can be fixed with a tie.<br>Make sure that the current direction of the cable is consistent with the arrow on the transformer. |

| | | |
|---|---|---|
| 3 |  | Connect two SDT10 transformer to the L1-phase and L3-phase cables respectively, and connect the lead wire to the corresponding wiring port of the SDT13. |
| 4 |  | Tighten the puncture knobs until the red power indicator lights on SDT10 and SDT13 are lit. |

Note: In the field installation, it is recommended to use insulating gloves to operate to prevent electric shock.



**(Tie fixed installation diagram)**