

HDT(S)S606

Three-phase
Electronic Watt-hour Meter
(LCD, infrared, and 485)

User Manual



Applicable Standard: IEC 62053-21
Please carefully read the User Manual before the installation and use of the products. Keep it properly as backup.

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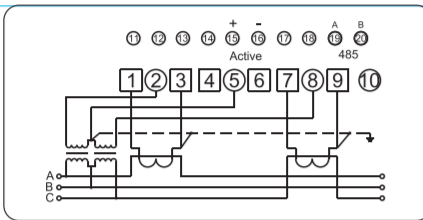


Fig. 5 HDT(S)S606 three-phase three-wire electronic watt-hour meter (LCD, infrared, and 485) 3×100 ≤3×10A, connected through the external current and voltage transformer

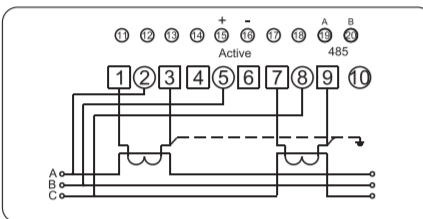


Fig. 6 HDT(S)S606 three-phase three-wire electronic watt-hour meter (LCD, infrared, and 485) 3×380V or 3×400V ≤3×10A, connected through the external current transformer

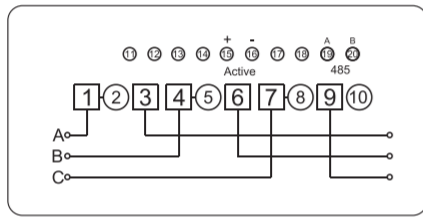


Fig. 7 HDT(S)S606 three-phase three-wire electronic watt-hour meter (LCD, infrared, and 485) 3×380V or 3×400V ≥3×20A, direct connection type

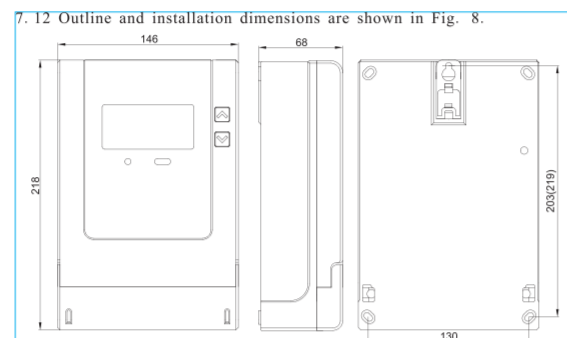


Fig. 8 Outline and installation dimensions

9 Transportation and storage
8.1 The energy meter shall not be subject to severe impact during transportation and unpacking.
8.2 The energy meter shall be packed in the original package; the storage ambient temperature is ranged -40°C to +70°C, the average relative humidity does not exceed 75%, and the storage environment shall be free of corrosive gas and moisture-proof.
8.3 The energy meter shall be placed on the bench in warehouse, and stacking height is not more than 5 cartons.
8.4 Do not power on the energy meter if the shell has obvious damage traces caused by severe impact or high-place fall during the handling, use, and installation, and please contact the supplier immediately.

Appendix:

Appendix 1: List of items normally displayed on the meter

| No. | Display item | Data display format | Remarks |
|-----|----------------------------------|---------------------|---------|
| 01 | Total current active electricity | XXXXXX.XX kWh | |

Appendix 2: List of keys items displayed on the meter

| No. | Display item | Data display format | Remarks |
|-----|---|---------------------|---------|
| 01 | Total current combined active electricity | XXXXXX.XX kWh | |
| 02 | Total current reversed active electricity | XXXXXX.XX kWh | |
| 03 | Communication address, low 8 bits | XXXXXXXX | |
| 04 | Communication address, high 4 bits | XXXX | |
| 05 | Pulse constant | C XXXX | |
| 06 | Maximum total demand of current positive active electricity | XX.XXXX kW | |
| 07 | Phase-A voltage | XXX.X V | |
| 08 | Phase-B voltage | XXX.X V | |
| 09 | Phase-C voltage | XXX.X V | |
| 10 | Phase-A current | XXX.XXX A | |
| 11 | Phase-B current | XXX.XXX A | |
| 12 | Phase-C current | XXX.XXX A | |
| 13 | Total instantaneous active power | XX.XXXX kW | |
| 14 | Phase-A instantaneous active power | XX.XXXX kW | |
| 15 | Phase-B instantaneous active power | XX.XXXX kW | |
| 16 | Phase-C instantaneous active power | XX.XXXX kW | |
| 17 | Total power factor | X.XXX | |
| 18 | Phase-A power factor | X.XXX | |
| 19 | Phase-B power factor | X.XXX | |
| 20 | Phase-C power factor | X.XXX | |

1 Overview
HDT(S)S606 and HDT(S)S606 three-phase electronic watt-hour meters (LCD, infrared, and 485) (hereinafter referred to as "energy meter") are active energy meters designed and developed to adapt to the reconstruction of power network. It has high accuracy and reliability. This energy meter is the high-tech product manufactured using SMT process and the internationally advanced ultra-low power consumption large scale integrated circuit technology. This product can meter three-phase AC active energy in the power network with a reference frequency of 50Hz, metering the positive and negative active power energy, and accumulate the power energy in one direction. Its features include high precision, good reliability, wide load, low power consumption, straight error curve, and strong anti-reference capacity, and this product is the best ideal selection for enterprises, substations or power plants which require active power energy assessment, and it's also suitable for power transmission and distribution or distribution network as an automation meter.

2 Working principle

The working principle of energy meter is shown in Fig. 1.

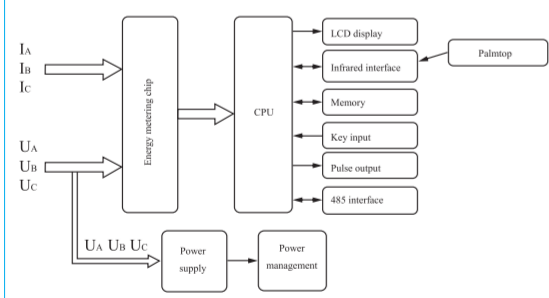


Fig. 1 Block diagram of energy meter working principle

The energy meter is mainly composed of two main functional parts: one is energy metering part and the other is microprocessor control part. The energy metering part uses large-scale application-specific integrated circuits to generate and send impulse sequence that indicates how much electricity is used to the microprocessor for power energy metering. After receiving pulse signal, the microprocessor will accumulate the number of input pulses to realize the accurate metering of power energy according to the size of pulse constant, and various interfaces are used to transfer data to realize various control functions.

3 Specifications

| Model and Name | Rated voltage | Basic current | Accuracy level |
|--|------------------------|---|----------------|
| HDT(S)S606 three-phase four-wire electronic active energy meter | 3×57.7/100V | 3×1.5(6)A | Class 1, 2 |
| | 3×220/380V, 3×230/400V | 3×1.5(6)A, 3×5(20)A, 3×10(40)A, 3×15(60)A, 3×10(100)A, 3×30(100)A | |
| HDT(S)S606 three-phase three-wire electronic active energy meter | 3×100V | 3×1.5(6)A, 3×3(6)A | Class 1, 2 |
| | 3×380V, 3×400V | 3×1.5(6)A, 3×3(6)A, 3×10(100)A | |

4 Main technical parameters

4.1 Basic errors

Table 2 Percentage error limits with balanced load

| Current | Active, Grade 1 | | Active, Grade 2 | | | |
|--------------------|-----------------------------|-------------------------|-------------------|--------|-------------------|--------|
| | Directly connected to meter | Through the transformer | Power factor COSφ | Error% | Power factor COSφ | Error% |
| 0.05Ib ≤ I ≤ 0.1Ib | ±0.02In | ±0.05In | 1 | ±1.5 | 1 | ±2.5 |
| 0.1Ib ≤ I ≤ Imax | ±0.05In | ±0.05Imax | 1 | ±1.0 | 1 | ±2.0 |
| 0.1Ib ≤ I ≤ 0.2Ib | 0.05In ≤ I ≤ 0.1In | 0.5L | ±1.5 | 0.5L | ±2.5 | |
| | | 0.8C | ±1.5 | 0.8C | ±2.5 | |
| 0.2Ib ≤ I ≤ Imax | 0.1In ≤ I ≤ Imax | 0.5L | ±1.0 | 0.5L | ±2.0 | |
| | | 0.8C | ±1.0 | 0.8C | ±2.0 | |

4.2 Start: The energy meter is in the state with reference voltage, reference frequency, and power factor are 1, and when the load current is direct connection type: ≤0.004Ib (class 1) and 0.005Ib (class 2), while when it is external transformer type: ≤0.002In (class 1) and 0.003In (class 2), then the energy meter can start and meter the electricity energy continuously.
4.3 Creeping: When 115% reference voltage is applied to the voltage circuit and there is no current in the current circuit, the output pulse shall not be more than 1.
4.4 Design life: The average life of the energy meter is not less than 10 years under the normal working conditions.

4.5 Electrical parameters:

Normal working voltage: (0.9~1.1) nominal voltage;
Severe voltage change: (0.0~1.15) nominal voltage;
Insulation voltage: ≥3000VAC/min;
Power consumption of voltage circuit: ≤2W and 10VA; Power consumption of current circuit: ≤1VA.
4.6 Weather conditions
Working temperature: -10°C~+55°C;
Humidity range
Average annual humidity: <75%;
The humidity (diffused in a natural way) can be up to 95% for 30 days in one year;
Up to 85% sometimes for other days.

5 Function description

5.1 With metering functions for positive active power energy and negative active power energy, it can store data to set active energy combination.
5.2 Infrared / RS485 functions
The physical layer of the communication channel is independent, and any damaged communication channel will not affect the normal operation of other channels. The power supply department can read data shown on the meter through the infrared / RS485 interface after the meter is certified.
The communication rate of RS485 interface can be set, and the standard rates include 1200bps, 2400bps, 4800bps, and 9600bps, while the default value is 2400bps.

6 Contents shown in LCD screen



6.1 Descriptions of symbols shown on LCD display are shown in Table.

| Symbol | Description |
|--------|--|
| | Indicate the current operation quadrant |
| | Data display and corresponding unit symbol |
| | Means Ua, Ub, and Uc, respectively; flash when voltage loss; the display symbols will disappear in case of phase failure or power-off. Note: On the three-phase three-wire meter, Ub will not be displayed. |
| | Indicate the current rate status |
| | Indicate the step tariff of the current 1 and 2 steps |

7 Installation and wiring method

7.1 The energy meter shall pass the inspection and sealed in the manufacturer factory before shipment. Please carefully read this User Manual before installation and use. Please directly contact the manufacturer if found damaged seal. To correctly connect wire, please follow the wiring diagram, otherwise this may cause permanent damage to the energy meter.
7.2 The energy meter shall be fixed and installed indoors where a dry and ventilated place is. The base plate shall be placed on a solid and fire-resistant wall where vibration is not easily generated. It is recommended that the installation height is about 1.8m, and the energy meter can be vertical after installation.
7.3 The energy meter shall be connected to the circuit according to the specified phase sequence (positive phase sequence), and wires are connected according to the wiring diagram on the nameplate. The copper wire or copper connector is used for leading-in. If multi-stranded copper wire is used, its head shall be twisted tightly and then tinned before connecting to the terminal box of the energy meter. All screws of the terminal box must be tightened firmly to prevent being burnt due to poor contact of the connector in the terminal box. Furthermore, when the energy meter is installed, check the circuit works normally with a multimeter before power "on", and find out cause for troubleshooting if necessary.
7.4 Lightning protection measures are taken at the installation place where there are many thunderstorms in order to prevent damage to the energy meter due to lightning stroke.
7.5 If installed at the place where there is dirty and mechanical damage, the energy meter shall be put into the protection cabinet.
7.6 Only the personnel authorized by the authority can be allowed to install, remove, check and seal the energy meter. The voltage of the connected energy meter shall be consistent with the specified reference voltage, and the current shall not exceed the maximum rated current.
7.7 The load capacity of energy meter shall be ranged from 0.05Ib to Imax, and the metering will be inaccurate if out of this range.
7.8 The electricity consumption can be directly read on the window of the direct connection type energy meter. When the energy meter uses an external transformer, the actual electricity consumption can be obtained by multiplying the electricity consumption reading on the window by the transformer ratio.
7.9 Before connecting the energy meter, the protection switch that is consistent with the load of energy meter and has protection function shall be firstly connected.
7.10 Before installing energy meter, slightly shake the entire energy meter, and please contact the manufacturer immediately if heard any abnormal sound from the meter.
7.11 The wiring diagrams of energy meter are shown in Fig. 2 to Fig. 7. Note: Please cut off the power supply before installing and wiring the energy meter to avoid accidents.

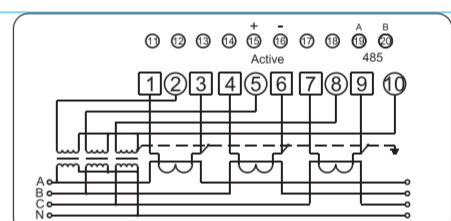


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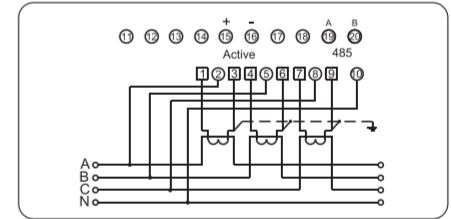


Fig. 3 HDT(S)S606 three-phase four-wire electronic watt-hour meter (LCD, infrared, and 485) 3×220/380V or 3×230/400V ≤3×10A, connected through the external current transformer

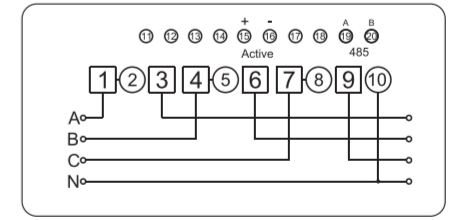


Fig. 4 HDT(S)S606 three-phase three-wire electronic watt-hour meter (LCD, infrared, and 485) 3×220/380V or 3×230/400V ≥3×20A, direct connection type