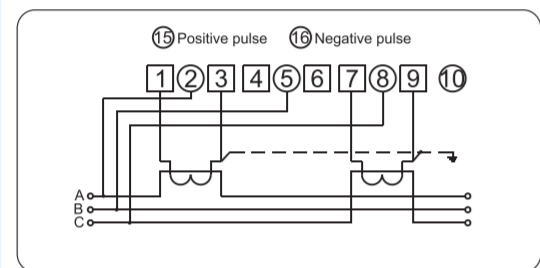
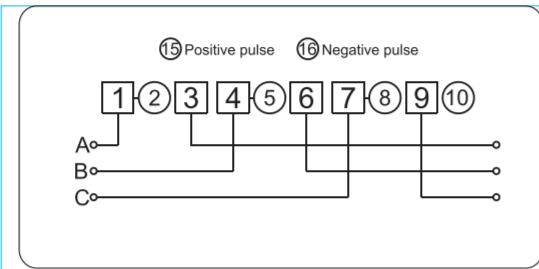


Wiring diagram of three-phase three-wire external current and voltage transformer connection
(3x100V 3x1.5(6)A, 3x3(6)A)



Wiring diagram of three-phase three-wire external current transformer connection
(3x380V or 3x400V 3x1.5(6)A, 3x3(6)A)



Wiring diagram of three-phase three-wire direct connection
(3x380V or 3x400V >=3x5(20)A)

7 Common faults and troubleshooting, as listed in Table 3.

Note: It is assumed that the energy meter is in the normal working state for the following situations.

Table 3 Common faults and troubleshooting

Fault	Solution
The pulse lamp does not flash	At the power-off state, check whether the energy meter is wired correctly; if incorrect, following the User Manual to do wiring correctly; if correct, please contact the after-sales personnel.
Register does not work	

8 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 from -25°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 put on the bench in warehouse, and stacking height is not more than 6 cartons. After unpacking, stacking height for individual packing is not more than 10 meters.
- 8.4 Do not power on the energy meter if the shell has obvious damage traces caused by

severe impact or high-place falling during the transporting, use, and installation, and please contact the supplier as soon as possible.

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HDT(S)S606
Three-phase
Electronic Watt-hour Meter

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.

1 Overview
HDT(S)S606 and HDSS606 three-phase electronic watt-hour meter (hereinafter referred to as "energy meter") is an active energy meter designed and developed to adapt to the power network reconstruction. The product has high accuracy and high reliability. This meter is the high-tech product manufactured by SMT process with the international advanced ultra-low power consumption large scale integrated circuit technology. This meter can be used to meter three-phase AC active energy in the power network with a reference frequency of 50Hz, and to meter the positive and negative active energy, and to accumulate the electric energy in one direction. The product features include high precision, good reliability, wide load, low power consumption, straight error curve, and strong anti-reference capacity. It is the optimal selection for enterprises, substations or power plants which have request of active power energy assessment, and it is also suitable for power transmission and distribution or distribution network.

2 Working principle
The core of the energy metering unit of this meter is the large-scale integrated circuit, and the block diagram of the metering principle is shown in Fig. 1.

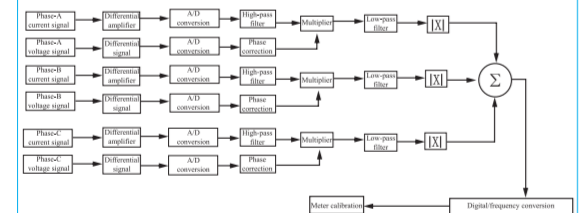


Fig. 1 Block diagram of watt-hour meter metering principle

The voltage signal can be obtained by sampling the current of the electric energy being measured in each phase which is going through current transformer, and then it's amplified by the differential amplifier inside the metering chip. The amplified signal is converted by A/D to the proportioned digital signal, and then it can enter one input end of the digital multiplier after the DC component in signal is removed through the high-pass filtering. The voltage signal measured is sampled through the resistive divider, and then it's amplified by the differential amplifier inside the metering chip; the amplified signal is then converted by A/D to the proportioned digital signal, entering into the other input end of the digital multiplier for multiply operation with the signal of the current

channel to realize the instantaneous power metering which is the measured electric energy. The instantaneous output power in each phase is integrally processed through the digital low-pass filter, and then enter the "digital / frequency" converter after absolute value accumulation; the output of the high-frequency pulse signal from the frequency dividing circuit enables detection and pulse-driving indicator, and the low-frequency pulse signal is driving register to accumulate electric energy.

3 Model and specifications are listed in Table 1.

Table 1 Electronic watt-hour meter specifications

Model and name	Rated voltage (V)	Basic current (A)	Accuracy level
HDSS606 three-phase three-wire electronic watt-hour meter	3x100	3x1.5(6), 3x3(6)	Class 1, Class 2
	3x380, 3x400	3x1.5(6), 3x3(6), 3x5(20), 3x5(40), 3x5(60), 3x20(80), 3x10(100)	
HDT(S)S606 three-phase four-wire electronic watt-hour meter	3x57.7/100	3x1.5(6), 3x3(6)	Class 1, Class 2
	3x220/380, 3x230/400	3x1.5(6), 3x3(6), 3x5(20), 3x5(40), 3x5(60), 3x20(80), 3x10(100)	

4 Main technical parameters

4.1 Basic errors, and percentage error limits with balanced load are listed in Table 2.

Table 2 Percentage error limits with balanced load

Current value	Active Power Class 1		Active Power Class 2		
	Directly connected to meter	Through the transformer	Power factor COS Φ	Error %	Power factor COS Φ
0.05Ib ≤ I < 0.1Ib	0.02In ≤ I < 0.05In	1	±1.5	1	±2.5
0.1Ib ≤ I ≤ Imax	0.05In ≤ I ≤ Imax	1	±1.0	1	±2.0
0.1Ib ≤ I < 0.2Ib	0.05In ≤ I < 0.1In	0.5L	±1.5	0.5L	±2.5
0.2Ib ≤ I ≤ Imax	0.1In ≤ I ≤ Imax	0.8C	±1.5	0.8C	±2.5
		0.5L	±1.0	0.5L	±2.0
		0.8C	±1.0	0.8C	±2.0

Percentage error limits with unbalanced load: ±2.0; Active Class-1 meter; ±3.0; Active Class-2 meter.

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 (for Class 1) and ≤0.005Ib (for Class 2); while when it is external transformer type: ≤0.002In (for Class 1) and ≤0.003In (for 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 Range of working voltage
Range of specified working voltage: (0.9~1.1) reference voltage
Range of expanded working voltage: (0.8~1.15) reference voltage
Range of ultimate working voltage: (0.0~1.15) reference voltage.

4.5 Power consumption
Power consumption of voltage circuit: ≤2W/10VA; Power consumption of current circuit: ≤4.0VA.

4.6 Environment conditions
4.6.1 Temperature range
Range of specified working temperature: -10°C~+45°C;
Range of ultimate working temperature: -25°C~+55°C.
4.6.2 Humidity range: Annual average relative humidity: <75%.

5 Main functions
5.1 Metering functions: To meter the positive and negative active electric energy accurately, and accumulate the electric energy in one direction.
5.2 Indicator: When the red indicator flashes, this indicates that the energy meter is working for metering.
5.3 The meter is powered by three-phase power supply, and the metering accuracy will not be affected when one phase or two phases are disconnected.

6 Installation and wiring method
6.1 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, or this may cause permanent damage to the energy meter.

- 6.2 The energy meter shall be fixed and installed indoors where a dry and ventilated place is. The base plate where the energy meter is installed shall be placed on a solid, fire-resistant wall which is not easy to vibrate. The energy meter shall be installed vertically.
- 6.3 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 terminal cover. The copper wire or copper connector must be 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 energy meter being burnt due to poor contact of the connector in the terminal box. Furthermore, when the energy meter is installed, check whether the circuit works normally by using a multimeter before power-on, and find out cause for troubleshooting if necessary.
- 6.4 Lightning protection measures are taken at the installation place where there are many thunderstorms to prevent damage to the energy meter due to lightning stroke.
- 6.5 If installed at the place where there is dirty and mechanical damage, the energy meter shall be put into the protection cabinet.
- 6.6 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 value.
- 6.7 The load capacity of energy meter shall be ranged from 0.05Ib to Imax, and the metering accuracy will be affected if out of this range.
- 6.8 The electricity consumption on the window of the direct connection type energy meter can be directly read. 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.
- 6.9 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.
- 6.10 Before installing energy meter, slightly shake the entire energy meter, and please contact the manufacturer immediately if heard any abnormal sound from the meter.
- 6.11 Outline and installation dimensions are shown in Fig. 2.

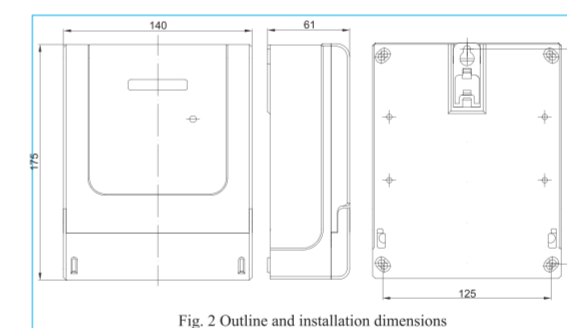
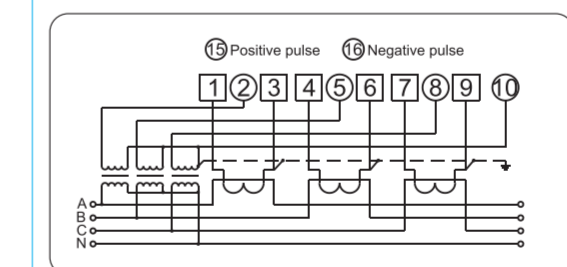
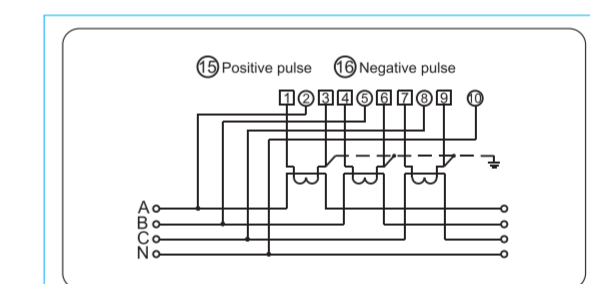


Fig. 2 Outline and installation dimensions

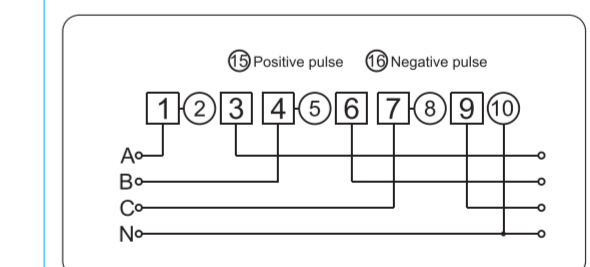
6.12 Wiring diagram is shown in figure below.
Note: Please disconnect the power supply before installing and wiring the energy meter to avoid accidents. Please connect wires according to the correct method shown in figure below. Wrong or reversed connection will cause that the register does not work or wrong accumulation.



Wiring diagram of three-phase four-wire external current and voltage transformer connection
(3x57.7/100V 3x1.5(6)A, 3x3(6)A)



Wiring diagram of three-phase four-wire external current transformer connection
(3x220/380V or 3x230/400V 3x1.5(6)A, 3x3(6)A)



Wiring diagram of three-phase four-wire direct-connection
(3x220/380V or 3x230/400V >=3x5(20)A)