DDSY2377 Electronic Single-Phase Electric Meter (RS485 Model)

◎summary

The RS485 communication protocol is a wired data transmission method designed for scenarios where installing dedicated RS485 cables is feasible. The RS485 remote prepaid electricity meter utilizes an affordable RS485 meter coupled with a collector to enable remote meter reading, remote control, and remote recharge functions. Compared to the traditional IC card-based billing approach, RS485-based remote prepaid systems represent a significant upgrade, offering time efficiency, reduced labor requirements, and enhanced operational performance, while substantially lowering both initial network deployment costs and subsequent maintenance expenses.

Our company's RS485 remote prepaid electricity meters, paired with our self-developed dual-platform backend management system for both computers and mobile devices, are user-friendly, efficient, and widely applicable in residential communities, schools, factories, shopping malls, and other settings. They have been increasingly adopted by real estate projects, property management companies, and campus dormitories, earning strong market acceptance.

◎Functions and Features

- **High precision: Error <±1.0%;**
- **High sensitivity: Starting current <0.4% Ib;**
- **High load: – Current overload factor>4 times;**
- **Low power consumption: The meter itself consumes <1 W;**
- **Lightweight: <0.6 kg;**
- **Starting current: Under conditions of rated voltage, rated load factor, and power factor of 1.0, the electricity meter operates normally when the load current exceeds 0.4% of LB.**
- Reference voltage (V): 220;
- Basic current Ib (A): 2.5 (10),5 (20),10 (40),15 (60),20 (80),30 (100);
- **The output interface features RS485 and infrared communication, enabling remote meter reading and supporting additional remote power switching functionality.**
- **Single rate, multiple rates, tiered electricity pricing (optional).**

◎ technical parameter

Rated current （A）	0. 5-1 (100) A
Rated voltage （V）	220 or 240
Rated frequency （Hz）	50 or 60
Class of accuracy	Class B

◎ RS485 Prepaid Electric Meter + Data Collector

Low-cost solution for remote meter reading, remote control, and remote payment

Electric meters are installed centrally and uniformly; each collector can connect up to 32 meters (can be customized for 64), without distinguishing between single-phase and three-phase models.

DDSY2377 Electronic Single-Phase Prepaid Payment System

◎summary

The DDDY2377 electronic single-phase prepaid electricity meter is a new IC-card-based model developed by our company, building upon high-performance electronic single-phase meters and featuring multiple functions including energy measurement, load control, and user information management. It represents an ideal solution for reforming the electricity pricing system, promoting electricity commercialization, addressing billing challenges, and optimizing grid load distribution.

The product complies with all technical requirements of GB/T 17215.321-2021 "Class 1 and Class 2 Fixed-System AC Active Energy Meters" and GB/T 18460.3-2001 "IC Card Prepaid Electricity Sales Systems – Part 3: Prepaid Energy Meters".

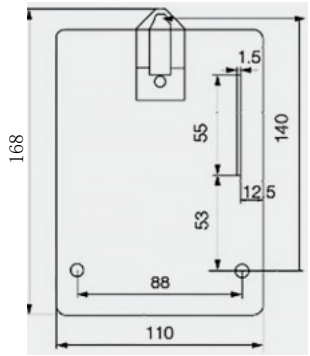
◎Functions and Features

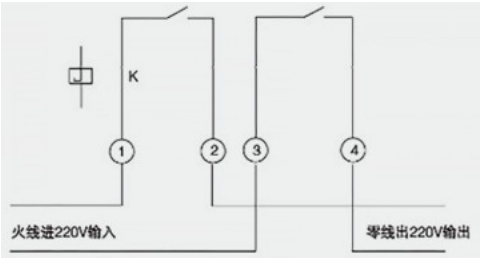
- ●With active energy metering, no calibration is required for long-term operation.
- ●Pay first, then use electricity.
- ●When the remaining battery level reaches the alarm threshold, the warning light remains on to remind users to recharge promptly.
- ● The system will trip and cut off power when the remaining battery charge reaches 0.
- ●Automatic power shutdown upon overload;
- ●High-capacity magnetic holding relay with low power consumption and high reliability;
- ●All components within the meter utilize long-lasting, highly reliable electronic parts, ensuring exceptional durability and reliability.
- ●Display mode: LCD display;
- ● Single rate, multiple rates, tiered electricity pricing (optional).

◎ technical parameter

Rated current （A）	0. 5-1 (100) A
Rated voltage （V）	220 or 240
Rated frequency （Hz）	50 or 60
Class of accuracy	Class B

◎External dimensions and wiring diagram (mm)





Note: Pulse data collection port: Pulse line: ⑧+⑩ -

DDSY2377 Single-Phase Electronic Remote Prepaid Payment Device (4G)

◎ summary

The DDDY2377 electronic single-phase prepaid electricity meter employs an advanced dedicated integrated circuit design and is manufactured using a fully automated surface-mount technology (SMT) process. Its circuit design and component selection are based on extensive environmental tolerance considerations, ensuring long-term stable operation with high precision, excellent overload capacity, low power consumption, and superior reliability. It utilizes advanced intelligent IoT technology compliant with international standards for the prepaid billing function and features a built-in magnetic retention relay. The control relay manages load activation/deactivation, enabling users to purchase electricity in advance before consuming it.

The product complies with all technical requirements specified in GB/T 17215.321-2021 "Class 1 and Class 2 Stationary AC Active Energy Meters" and GB/T 18460.3-2001 "IC Card Prepaid Electricity Sales Systems – Part 3: Prepaid Energy Meters".

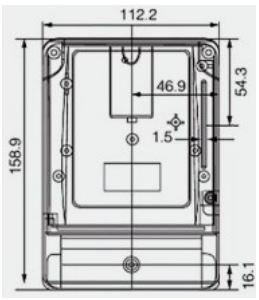
◎ Functions and Features

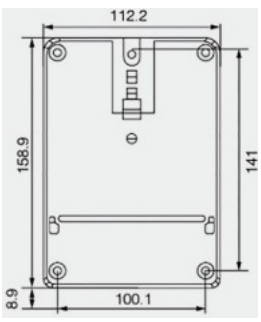
- **Grade B active power metering;**
- **Remote closing control function;**
- **Communication methods include 485 (with optional carrier or wireless options)**
- DL/T645-2007 Communication Protocol;
- **Staged prepaid plan with 8 time slots and 4 tiered options;**
- **Electricity storage function: Stores historical electricity consumption data from March. The automatic meter reading date can be set.**
- **Handheld terminal with on-site infrared configuration management functionality;**
- **Liquid crystal display with high-brightness LED backlight and wide temperature range;**
- **The broadcast time-setting function allows users to configure dates and times without being restricted by hardware programming switches or software passwords, via 485 or infrared interfaces.**
- **Set the maximum power load either centrally or individually; disconnect the supply when overload occurs and record it.**
- **The remaining options are 0 (power cut-off) and forced power cut-off by the main station.**
- **The power department may unconditionally cut off or supply electricity, and the device can be used as a standard remote-controlled electricity meter.**
- **Battery low voltage alarm indicator;**
- **4 different types of tiered electricity pricing schemes;**
- **Single Rate, Multiple Rates (optional).**

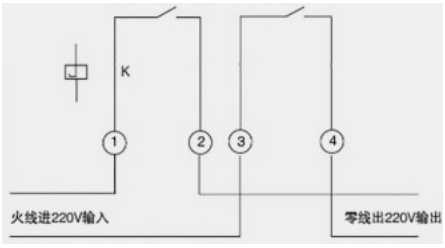
◎ technical parameter

Rated current （A）	0. 5-1 (100) A
Rated voltage （V）	220 or 240
Rated frequency （Hz）	50 or 60
Class of accuracy	Class B

◎ External dimensions and wiring diagram (mm)







Note: Pulse data collection port: Pulse line: ⑨+2-

DTSY2377 Three-Phase, Four-Wire Electronic Prepaid Electricity Meter

◎ summary

The DTSY2377 three-phase four-wire electronic prepaid electricity meter is a device featuring multiple functions including energy measurement, load control, and user information management. It represents an ideal solution for reforming the electricity consumption system, achieving electricity commoditization, addressing billing challenges, and regulating grid load conditions. This series of electronic three-phase meters supports two connection methods: direct connection or connection via a current transformer.

The product complies with all technical requirements specified in GB/T 17215.321-2021 "Class 1 and Class 2 Fixed-Flow AC Active Energy Meters" and GB/T 18460.3-2001 "IC Card Prepaid Electricity Sales Systems – Part 3: Prepaid Energy Meters".

◎Functions and Features

●Measures three-phase active power consumption without requiring calibration during prolonged operation.

● Operates on a three-phase power supply: power interruption to either one wire (any one of the three wires in a three-phase three-wire meter) or two wires (any two of the four wires in a three-phase four-wire meter) does not affect measurement accuracy.

●Buy electricity first, then use it.

· When the remaining battery level reaches the alarm threshold, the warning light remains on to remind users to recharge promptly.

· The power supply will be cut off when the remaining battery charge reaches 0.

●Automatic power shutdown in case of overload;

· Features data backwriting capability, facilitating management by power authorities.

●The mutual-induction load switch is installed externally to the meter and controlled internally by a relay (with contact capacity of 250 VAC/5 A).

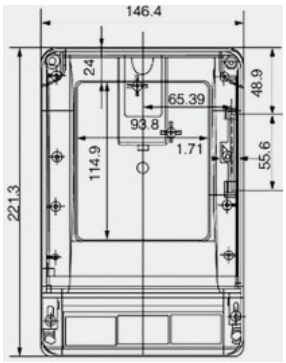
● Single rate, multiple rates, tiered electricity pricing (optional);

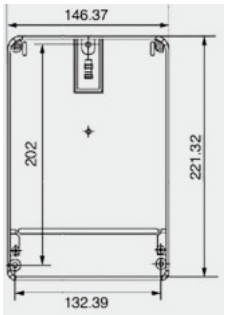
●RS485。

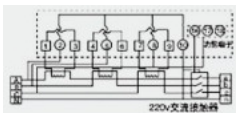
◎ technical parameter

Rated current （A）	0.4-1(100)A
Rated voltage （V）	3×220/380V 3×380V
Rated frequency （Hz）	50 or 60
Class of accuracy	Class B

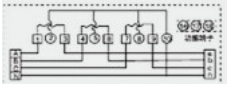
◎ External dimensions and wiring diagram (mm)



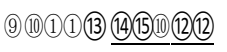




Three-phase, four-wire interdependent induction wiring diagram



Power Terminal Wiring Diagram



The Shiyue shared station cable has a diameter of 485 mm, and its tension control is required.

Functional Terminal Wiring

DTSY2377 Electronic Three-Phase Four-Wire Prepaid Electric Meter (4G)

◎ summary

The DTSY2377 electronic three-phase four-wire prepaid electricity meter is a innovative wireless device integrating multiple functions including energy measurement, load control, and user information management.**It serves as an ideal solution for reforming the electricity consumption system, promoting electricity commercialization, addressing billing challenges, and optimizing grid load distribution. This series of electronic three-phase meters supports two connection methods: direct connection or connection via current transformers.**

The product complies with all technical requirements of GB/T 17215.321-2021 "Class 1 and Class 2 Static AC Active Energy Meters" and GB/T 18460.3-2001 "IC Card Prepaid Electricity Sales Systems – Part 3: Prepaid Energy Meters."

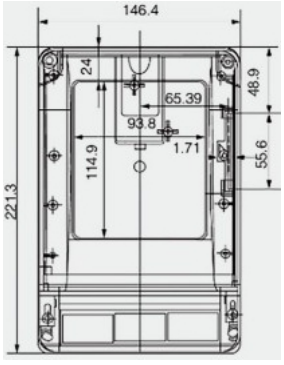
◎Functions and Features

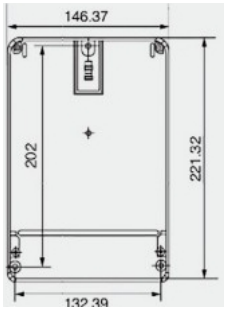
- Measures three-phase active power consumption without requiring calibration during prolonged operation.
- **Operates on a three-phase power supply: power interruption to either one wire (any one of the three wires in a three-phase three-wire meter) or two wires (any two of the four wires in a three-phase four-wire meter) does not affect measurement accuracy.**
- **Buy electricity first, then use it.**
- **One table (household) corresponds to one card, offering excellent anti-counterfeiting features.**
- When the remaining battery level reaches the alarm threshold, the warning light remains on to remind users to recharge promptly.
- **The system will trip and cut off power when the remaining battery charge reaches 0.**
- Automatic power shutdown upon overload;
- Features data backwriting capability, facilitating management by power authorities.
- The mutual-induction load switch is installed externally to the meter and controlled internally by a relay (with contact capacity of 250 VAC/5 A).
- **Scalable RS485;**
- **Single rate, multiple rates, tiered electricity pricing (optional);**

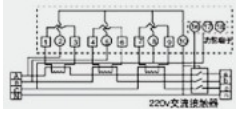
◎technical parameter

Rated current （A）	0.4-1(100)A
Rated voltage （V）	3×220/380V 3×380V
Rated frequency （Hz）	50 or 60
Class of accuracy	Class B

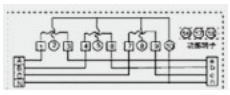
◎ External dimensions and wiring diagram (mm)







Three-phase, four-wire interdependent induction wiring diagram



Power Terminal Wiring Diagram

Functional Terminal Wiring

DDSD3599 Rail-mounted single-phase electricity meter (2P) (4 G optional)

◎ summary

The guide-rail type single-phase energy meter was developed to meet the requirements of China's power grid modernization, specifically designed for measuring single-phase active power at reference frequencies of 50 Hz/ 60 Hz. This meter employs internationally advanced ultra-low-power large-scale integrated circuit technology and SMT manufacturing processes, offering significant advantages such as high measurement accuracy, excellent stability, superior reliability, intuitive display, and strong overload capacity. Key components utilize long-life parts from internationally renowned brands, and it features an LCD display for clear and easy reading. Equipped with infrared and RS485 communication capabilities, this meter provides a sophisticated and reliable solution for single-phase energy measurement.

This instrument complies with the standard DL/T 645-2007 "Communication Protocol for Multifunctional Meters", the Modbus protocol, and GB/T 17215.321-2008 "Class 1 and Class 2 Fixed-Point AC Active Energy Meters".

◎ Functions and Features

- **Provide the cumulative electricity consumption value when power is depleted.**
- **5+a 1-bit wide temperature-sensitive LCD display.**
- **Standard 36 mm rail installation method.**
- **The total power consumption is less than 2 W at 5 V A.**
- **Single-rate, multi-rate, or tiered electricity pricing (optional);**
- **Manual reset function (optional).**
- **Backlit display (optional).**

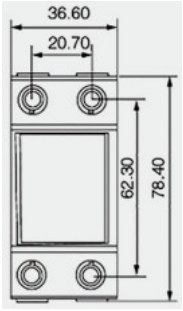
◎ technical parameter

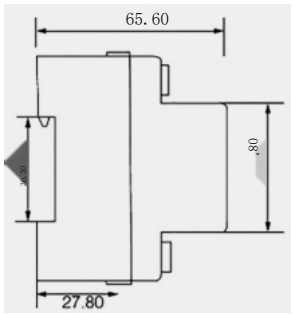
Reference voltage （Un）	220V
Working voltage	181/279V AC(3~)
Rated current （Ib）	2.55A 10A 15A 20A30A
Maximum Current (Imax)	10A 20A 40A 60A 80A 100A
Starting current	≤0.004b (Direct Access)
Tolerance to overload current	301max 0.01s
Service frequency	50Hz±10%
Internal Power Consumption	≤2W/10VA
Pulse Constant	1000imp
Communication Protocol	DL/T645-2007 or MODBUS is optional
Class of accuracy	Level 1

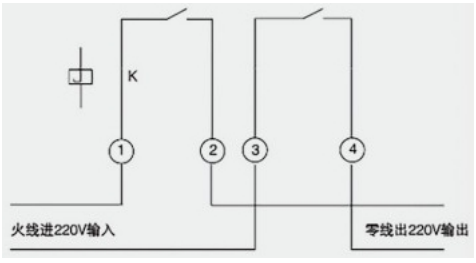
◎ Main Structure and Working Principle

The electrical energy consumed by the user is sampled via signals from the voltage divider and current divider, then sent to the amplifier and multiplier circuit. The resulting product signal undergoes integration and V/F conversion before being output by a logic frequency divider circuit to drive the LCD display for energy measurement.

◎ External dimensions and wiring diagram (mm)







Note: Pulse data collection port: Pulse line; ⑨ + ⑩ -

DDSD3599 Rail-mounted Single-Phase Electric Meter (4P model; 4G option available)

◎ summary

The guide-rail type single-phase energy meter was developed to meet the requirements of China's power grid modernization, specifically designed for measuring single-phase active power at reference frequencies of 50 Hz/60 Hz. This high-tech device employs internationally advanced ultra-low-power large-scale integrated circuit technology and SMT manufacturing processes, offering significant advantages such as high measurement accuracy, excellent stability, superior reliability, intuitive display, and strong overload capacity. Key components utilize long-life parts from internationally renowned brands, and the display utilizes an LCD screen for clear and easy reading. Equipped with infrared and RS485 communication capabilities, it serves as a sophisticated and reliable instrument for single-phase energy measurement.

This instrument complies with the standards DL/T 645-2007 "Communication Protocol for Multifunctional Meters", the Modbus protocol, and GB/T 17215.321-2008 "Class 1 and Class 2 Fixed-Point AC Active Energy Meters ".

◎ Functions and Features

●**Measurement Function: Measures both forward and reverse active power consumption, accumulates total electricity usage, and features bidirectional metering to prevent electricity theft.**

●**Use a high-quality meter or LCD display to accumulate battery level information, offering clear, vibrant visuals with excellent readability.**

●**Electric energy measurement pulse LED indicator (red).**

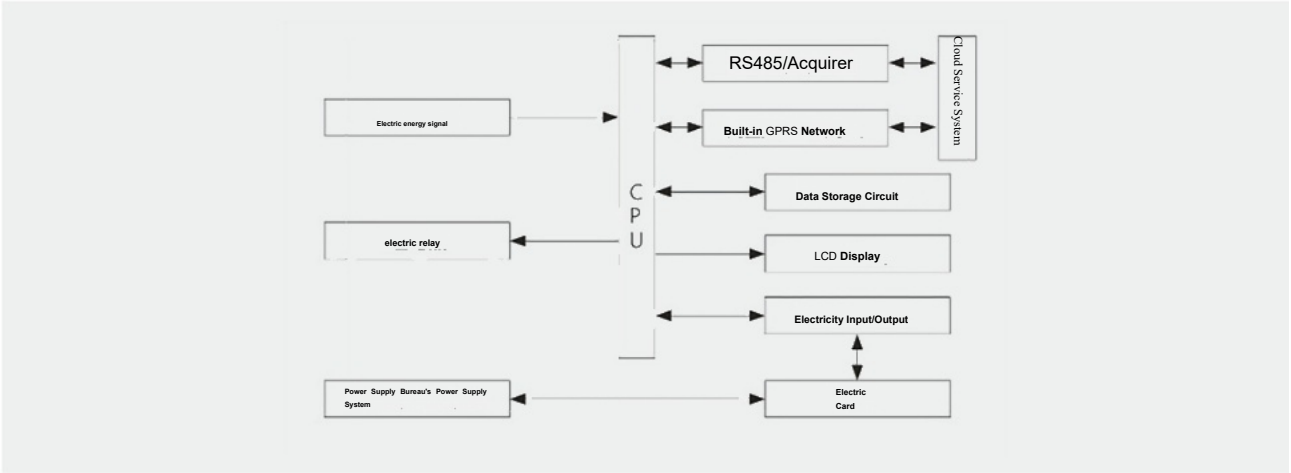
● **Reverse sequence indication (standard type).**

●**It features a passive pulse output interface with optoelectronic isolation, facilitating meter calibration and pulse data acquisition.**

●The 485 communication interface supports three modes: DL/T645-97, DL/T645-2007, and Modbus RTU; please specify these during ordering.

◎operational principle

The electricity meter uses a voltage divider to obtain voltage sampling signals and a shunt resistor to obtain current sampling signals. These signals are multiplied by a multiplier to produce a voltage-current product signal, which is then converted into a counting pulse proportional to this product. This pulse drives a stepper motor via frequency division to measure energy consumption. The CPU is connected to an RS485 chip or built-in GPRS module to receive control or data acquisition signals; the communication protocol follows the DL/T645-2007 standard.



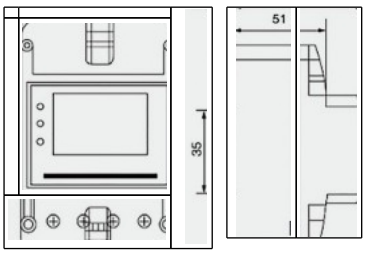
DDSD3599 Rail-mounted single-phase electricity meter (4P) (4G optional)

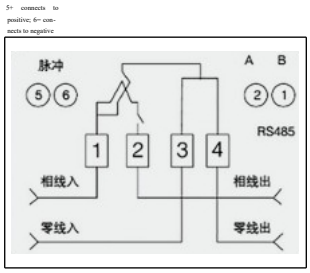
◎technical parameter

Rated current （A）	2.5(10)、5(20)、5(30)、10(40)、10(60)、15(60)、20(80)、30(100)
Rated voltage （V）	220 or 240
Rated frequency （Hz）	5 0 or 6 0
Class of accuracy	Class B

Load current	Power factor	Percentage Error Limit (%)
0.051b≤|<0.11b	1.0	±1.0
0.11b≤I≤Imax		±0.6
0.11b≤I<0.21b	0.5 (lag)	±1.0
0.21b≤I≤Imax	0.8 (Advanced)	±0.6

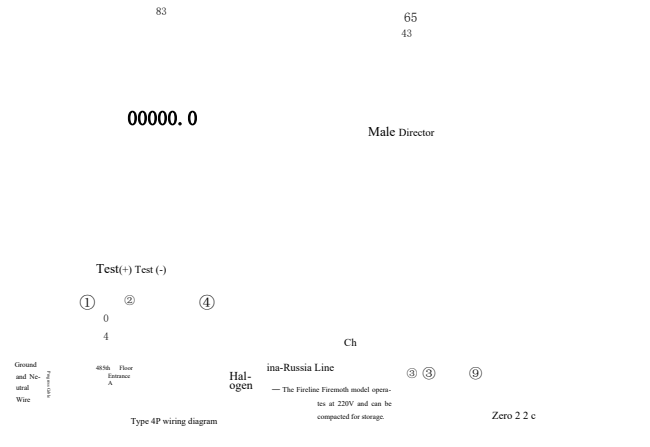
◎Reference Conditions





◎

Rated current （A）	0.4-1(100)A
Rated voltage （V）	220 or 240
Rated frequency （Hz）	50 or 60
Class of accuracy	Class B



Type 4P wiring diagram

Law: The stomach is stimulated by shock; the pulse suddenly stops: ③-③-

DTSD3599 model (three-phase rail-mounted version): a three-phase, four-wire electronic prepaid electricity meter with optional 4G connectivity

◎summary

The DTSD3599 three-phase four-wire electronic prepaid electricity meter is a new comprehensive electronic meter developed by our company utilizing microelectronic technology for energy measurement, incorporating imported specialized large-scale integrated circuits, digital sampling processing techniques, and advanced SMT manufacturing processes. This meter fully complies with the technical requirements for Class 1 three-phase active energy meters specified in both the GB/T 17215.321-2008 national standard and the IEC 62053-21 international standard. It enables direct and precise measurement of forward active power consumption, displays active energy usage on a 7-digit LCD screen, and features excellent reliability, compact size, lightweight design, aesthetic appearance, advanced manufacturing technology, and 35mm DIN-standard rail mounting. Additionally, it offers superior electromagnetic interference immunity, low self-consumption for energy efficiency, high accuracy, high overload capacity, exceptional stability, anti-theft protection, long service life, as well as optional RS485 communication, remote prepaid functionality, and remote control capabilities.

This table is applicable to the measurement of three-phase AC active power with rated frequencies of 50 Hz or 6 0 Hz. It is designed for fixed indoor installation and suitable for environments where the temperature ranges from-25°C to +55°C, relative humidity does not exceed 95%, and the air contains no corrosive gases while being free from dust, mold, salt spray, condensation, insects, or other detrimental factors.

◎ Main Specifications and Technical Parameters

Name	Model	Accuracy	Rated voltage Ub	Rated current （A）
Three-phase, four-wire electricity meter	DTSD3599	Level 1	3×220/380V 3×57.5/100V	1.5(6)、5(20)、10(40)、15(60)、20(80)、30(100)
Three-phase, three-wire electricity meter	DTSD3599	Level 1	3×380V 3×100V	1.5(6)、5(20)、10(40)、15(60)、20(80)、30(100)

Note: In the rated current column, the value before parentheses represents the calibration current (b), while the value within parentheses represents the maximum rated current (Imax).

◎ technical parameter

Name	Model	Accuracy	Rated voltage Ub	Rated current （A）
0.051b	0.021b	1.0	±1.5	±2.5
0.11b	0.051b	0.5L	±1.5	±2.5
		0.8C	±1.5	
0.11b~1max	0.051b~1max	1.0	±1.0	±2.0
0.21b~1max	0.11b~1max	0.5L	±1.0	±2.0
		0.8C	±1.0	-
0.11b~1max	0.051b~1max	1.0	±2.0	±3.0
0.21b~1max	0.11b~1max	0.5L	±2.0	±3.0

Instrument Type	Accuracy Level 1	Accuracy Level 2
Direct Access Type	0.0041b	0.005 Ib
Connected via a current transformer	0.0021b	0.003 Ib

DTSD3599 model (three-phase rail-mounted version): a three-phase, four-wire electronic prepaid electricity meter with optional 4G connectivity

◎technical parameter

●Startup: Under rated voltage, rated frequency, and COSφ = 1 conditions, the energy meter will start up and continuously measure electrical energy when the load current reaches the values specified in the table below.

●Subtle activation: When there is no current in the electricity meter's current circuit but the voltage applied to its voltage circuit reaches 115% of the rated value, the meter's test output should not generate more than one pulse.

●Insulation Performance: All circuits of the electricity meter must withstand pulse voltages with a waveform of 1.2 V / 50 μs and a peak value of 6 kV applied between the meter housing and external components; when subjected to continuous testing under different polarities for 10 cycles, no arc discharge or breakdown shall occur. Additionally, all circuits must resist alternating current voltages of 2 kV applied as a practical sine wave at 50 Hz between the meter housing and any accessible metal parts on its exterior for a one-minute test period without experiencing breakdown.

● Working voltage range: 70–115% Ub.

● Power consumption: ≤2 W and 1 0 V A.

●Display: LCD display.

●Data retention: Can be stored for 12 months; after power outage, data remains preserved for at least 10 years.

◎Installation and Usage

●Installation Notes and Methods

○Electricity meters must pass factory inspection and bear a lead seal before installation. Those without a lead seal or stored for an extended period must be re-inspected by authorized authorities prior to use. If the inner packaging or casing is damaged upon removal from its original box, do not install or energize the meter; contact our technical service department immediately.

○The installation of electricity meters must be performed by experienced electricians or professionals, and you must read this manual thoroughly.

The electricity meter shall be installed in a ventilated and dry indoor location using a 35 mm DIN-standard track mounting system. The base plate for installing the electricity meter shall be fixed to a sturdy, fire-resistant wall that is resistant to vibration.

○In areas with contamination or potential damage to equipment, electricity meters must be installed within a protective cabinet.

○During installation and wiring, follow the wiring diagram on the electricity meter's terminal cover or the corresponding diagram in this manual. The wiring should preferably accommodate multiple copper wires to prevent abnormal operation or damage to the electricity meter due to poor contact.

● direction for use

○When installing electricity meters in areas with frequent lightning strikes, lightning protection measures must be implemented to prevent damage caused by lightning strikes.

○The load capacity of an electricity meter ranges from 0.05|b to Imax (for direct connection) or 0.021b to Imax (for connection via a transformer). Exceeding this load range may cause inaccurate metering or damage the current coil due to overheating.

When an electricity meter is paired with a current transformer, the actual electricity consumption must be obtained by multiplying the meter's reading by the transformer's ratio.

○Data shows: It features a 7-digit LCD display or meter.

Power status indicator: When all three LED indicators (L1, L2, L3) are lit, it signifies normal three-phase power supply; if a phase voltage is absent, the corresponding low-voltage indicator will turn off.

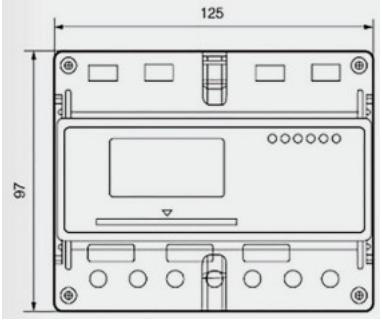
○Pulse Indicator: The PULSE indicator light turns on when an electrical pulse is detected (it remains lit for approximately 80 ms after a sampling signal is received).

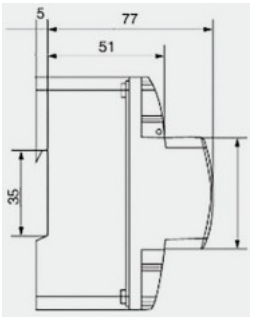
○Note: Before using the electricity meter, verify that all programming is correct.

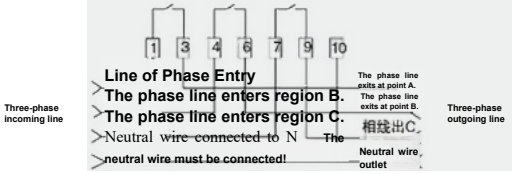
Function Terminal Wiring Diagram

1	2	3	4	5	6	7	8	9	10
Impulse -	Impulse +	Normally open	Normal close	Common port		485−	485+		

◎ External dimensions and wiring diagram (mm)







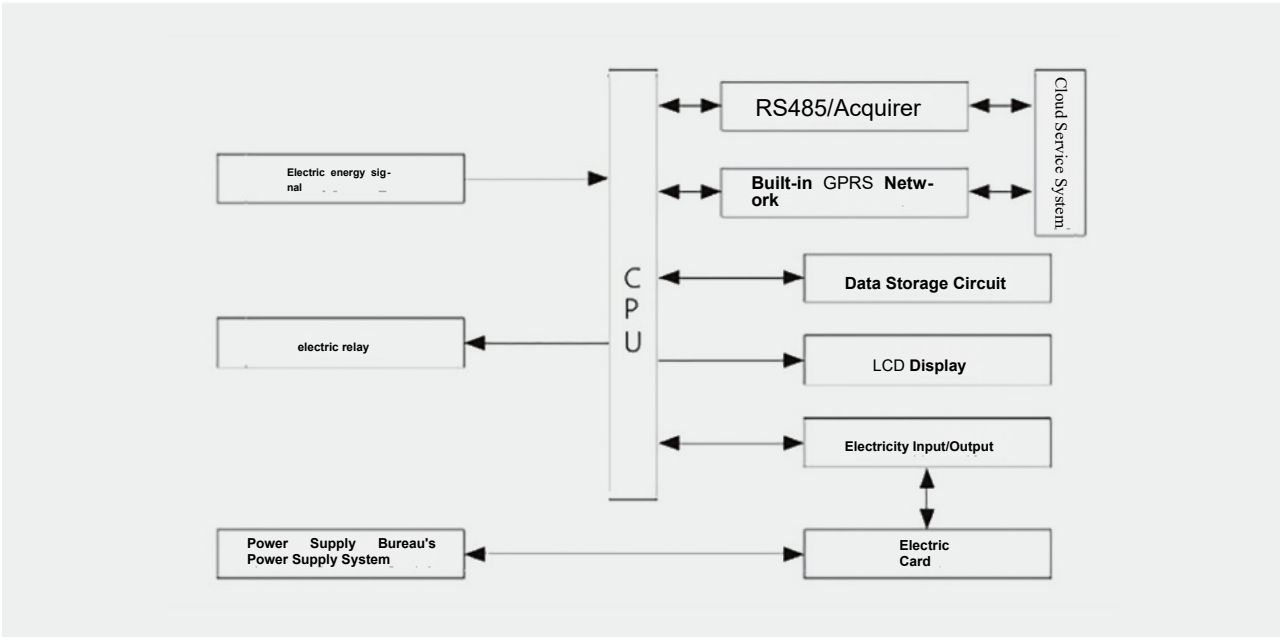
DTSD3599 model (three-phase rail-mounted version): a three-phase, four-wire electronic prepaid electricity meter with optional 4G connectivity

◎ data handling

Electricity measurement data are transmitted to the CPU via an optocoupler for processing and subsequently stored in memory. The computer management information system writes specified energy values and monitoring parameters into the IC card input table using an IC card reader; after processing by the microprocessor system via the CPU, it provides display outputs and alarm status signals.

◎ operational principle

The electricity meter uses a voltage divider to obtain voltage sampling signals and a shunt resistor to obtain current sampling signals. These signals are multiplied by a multiplier to produce a voltage-current product signal, which is then converted into a counting pulse proportional to this product. This pulse drives a stepper motor via frequency division to measure energy consumption. The CPU is connected to an RS485 chip or built-in GPRS module to receive control or data acquisition signals and respond accordingly, using the DL/T645-2007 communication protocol.



◎ technical parameter

rated current (A)	Rated Voltage (V): 3×220/380 V	rated frequency (Hz)	class of accuracy
1.5(6)、5(20) 10 (40)、15(60) 20 (80)、30(100)	3×380V 3×100V	50 or 60	Level 1 or Level 2

load current	Power Factor 1.0	Percentage error limits (% ±1.0, ± 0.6, ±1.0, ±0.6)
0.05Ib≤I<0.1Ib	0.5 (lag)	
0.1Ib≤I≤Imax	0.8 (Advanced)	
0.1Ib≤I<0.2Ib		
0.2Ib≤I≤Imax		

◎ Reference Conditions

Start-up current: 0.4% Ib;
Power consumption: Voltage line <1.0 W, 3.0 V A;**Current line <1.0 V A;**
Submarine Motion Prevention: Equipped with a logical anti-submarine motion circuit;

Voltage range: 220 V ±10%;
Operating temperature range: -25° C to +65°C; power-off data retention time>20 years.