

No. [SI-F-011-DDS26D-01]

DDS26D Operation Manual



Shenzhen Star Instrument Co., Ltd.

Caution: The user is cautioned that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This equipment should be installed and operated with a minimum distance of 20cm between the radiator and your body.

Change Log

Date	Version	Description of Major Changes
20240607	V1	Adapted from single-phase NH meter according to requirements
20240615	V2	Updated requirements, corrected parameters
20240618	V2.1	Removed parameters (disconnection reasons) after hardware adjustment
20240618	V2.2	Synchronized calendar with three-phase meter, adjusted time-of-use rates
20240619	V2.3	Modified wiring diagram
20240619	V3.0	Corrected errors in prepayment, communication, and load control
20240619	V3.1	Removed manual disconnection/reconnection operations
20240619	V3.2	Removed descriptions about disconnection reasons and prepayment
20240619	V3.3	Adjusted structural connection diagrams
20240620	V3.4	Updated based on test feedback
20240628	V3.5	Corrected code 100.8.0 → 19.8.0 in cyclic display

Approval

	Signature	Date
Prepared		
Verified		
Reviewed		
Approved		

Special Statement

Continuous improvement is the policy of Shenzhen Star Instrument Co., Ltd. We reserve the right to modify specifications without prior notice. Total or partial reproduction is prohibited without written authorization.

Preface

General Safety Requirements

This meter facilitates verification, installation, and operation. To prevent risks:

1. Read this manual thoroughly before any operation.
2. Only qualified personnel authorized by our company may perform maintenance.
3. Improper use or use outside specifications voids all manufacturer responsibility.

Safety Information

Signals according to risk level:



Warning! Indicates risk of serious injury or irreparable damage.



Caution! Indicates possible equipment damage, data loss, or minor injuries.



Safety Rules

- Respect maximum voltage/current ratings.
- Verify measured load capacity.
- **Safe installation and connection:**
- Use conductors with adequate cross-section.
- No contact with bare cables.
- Prohibited use in explosive environments.
- Keep equipment surface clean and sealed.
- Never immerse the meter in liquids or chemical agents.
- Displayed data are illustrative examples.
- Always disconnect power during installation/maintenance.
- Comply with local regulations: only certified technicians may handle the equipment.
- Discard meters with physical damage or impact.

Note: All specifications are subject to change without prior notice.

Corporate Profile of Shenzhen Star Instrument Co., Ltd.

Specialized in R&D, manufacturing, and marketing of energy metering systems, we have:

- Certified engineering team.
- ISO9001 management system certified by BSI (UK).
- Production processes with cutting-edge technology.

For over a decade, we have provided reliable solutions for global customers based on three pillars:

- Technology as the driver.
- Quality as the foundation.
- Constant innovation.

Committed to "Technical Excellence, Customer Focus," we drive the evolution of the electrical sector.

Product Line

- Single-phase/three-phase meters.
- Prepayment systems + commercial management.
- Multi-rate meters.
- Multifunction meters.
- PLC systems (carrier meters + remote collection).
- Metrological verification equipment.

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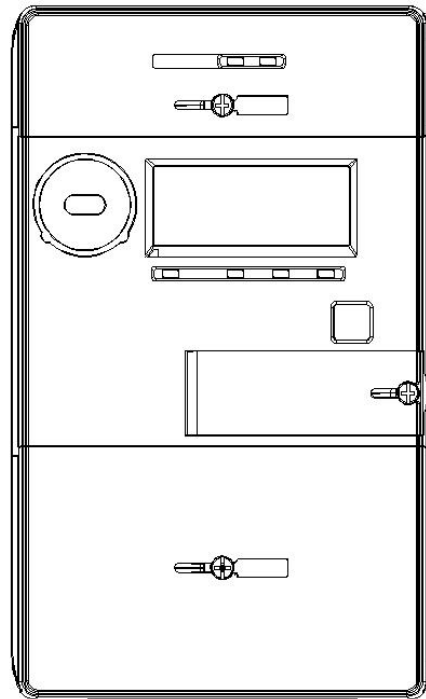
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1 Introduction to the Energy Meter

1.1 Technical Summary

Mechanical Configuration



Main Application

The single-phase post-payment meter DDS26D exchanges data through digital means. Key functionalities:

- ✓ Active energy and demand measurement.
- ✓ Post-payment mode.
- ✓ Removable interfaces for PLC/4G/RF modules.
- ✓ Remote reading and parameter configuration.

Key Features

- ▶ Combined energy: Sum of active + reactive energy.
- ▶ Load control: Automatic disconnection/reconnection due to overload.
- ▶ Event recording.
- ▶ LCD display: Shows energy, demand, rates, alerts.
- ▶ Touch buttons: Intuitive navigation.
- ▶ Dual communication:
 - PLC/4G/RF for remote reading.
 - Recharge management/control via Internet.
- ▶ Post-payment system:
 - Centralized reading.
 - Billing in master system.

Compliant Standards

IEC62052-11 Electricity metering equipment(AC)-General
requirements,tests and test conditions- Part11:Metering equipment

IEC62053-21 Electricity metering equipment(a.c.)-Particular
requirements-Part21:Static meters for active energy(classes 1 and 2)

IEC62056-21 Electricity metering - Data exchange for meter reading,
tariff and load control -Part 21: Direct local data exchange

IEC62056-46 Electricity metering --Data exchange for meter
reading,tariff and load control --Part 46:Data link layer using HDLC
protocol

IEC62056-53 Electricity metering --Data exchange for meter
reading,tariff and load control --Part 53:COSEM application layer

IEC62056-61 Electricity metering --Data exchange for meter reading,
tariff and load control --Part 61:Object identification system

IEC62056-62 Electricity metering --Data exchange for meter reading,
tariff and load control --Part 62:Interface classes

1.2 Technical Parameters

Connection	LNNL
Rated Voltage	220/380V
Rated Current (I_b)	5A
Maximum Current (I_{max})	80A
Starting Current	Active: 0.4%I _b Reactive: 0.5%I _b

Rated Frequency	50Hz
Accuracy Class	Active: Class 1 Reactive: Class 2
Pulse Constant	1000 imp/kWh 1000 imp/kvarh

Electrical Performance

Operating Voltage Range	0.7Un - 1.2Un
Starting Current	0.004Ib
Operating Frequency Range	50Hz ±5%
Power Consumption	Voltage line ≤1.5W, 10VA Current line ≤2.5VA

Electromagnetic Compatibility

No.	Project Name	IEC62053-21 Requirements
1	Electrostatic Discharge Immunity	Contact discharge: 8kV Air discharge: 15kV
2	High-Frequency Electromagnetic Field	80MHz-2GHz 30V/m

	Immunity	
3	Fast Transient Burst Immunity	4kV/2.5kHz
4	Radio Interference Test	Class B equipment CISPR 22
5	RF Field Induced Conducted Disturbance Immunity	150kHz–80MHz 10V/m
6	Surge Immunity	4kV

Insulation Performance

No.	Project Name	IEC62053-21 Requirements
1	Impulse Voltage	Class II insulation: 6kV
2	AC Voltage	Current line to ground (Class II insulation): 4kV Between auxiliary terminals: 2kV

Usage Environment

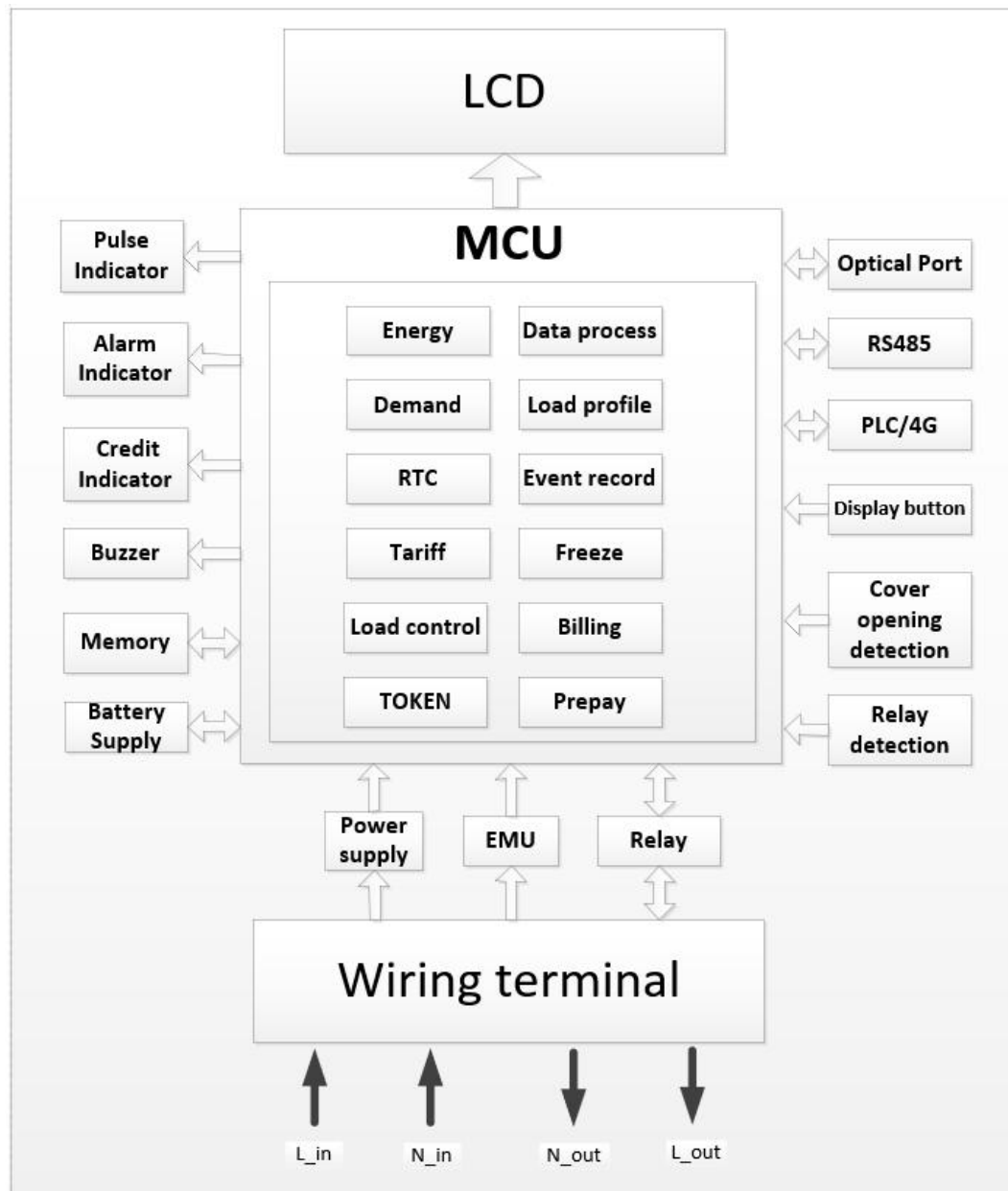
No.	Project Name	IEC62053-21 Requirements
1	Temperature	Operating temperature range: -25°C to 60°C Limit operating temperature range: -40°C to 70°C Storage and transportation temperature range: -40°C to

		80°C
2	Humidity	Annual average: $\leq 75\%$ 30 days per year: $\leq 95\%$ Rest of the time: $\leq 85\%$

Communication Interface

Type	Description	Baudrate
Unmodulated Infrared	Bidirectional serial communication interface	9600 bps 8N1
RS485	Bidirectional serial communication interface	9600bps 8N1
RF Module	Bidirectional serial communication interface	9600bps 8N1

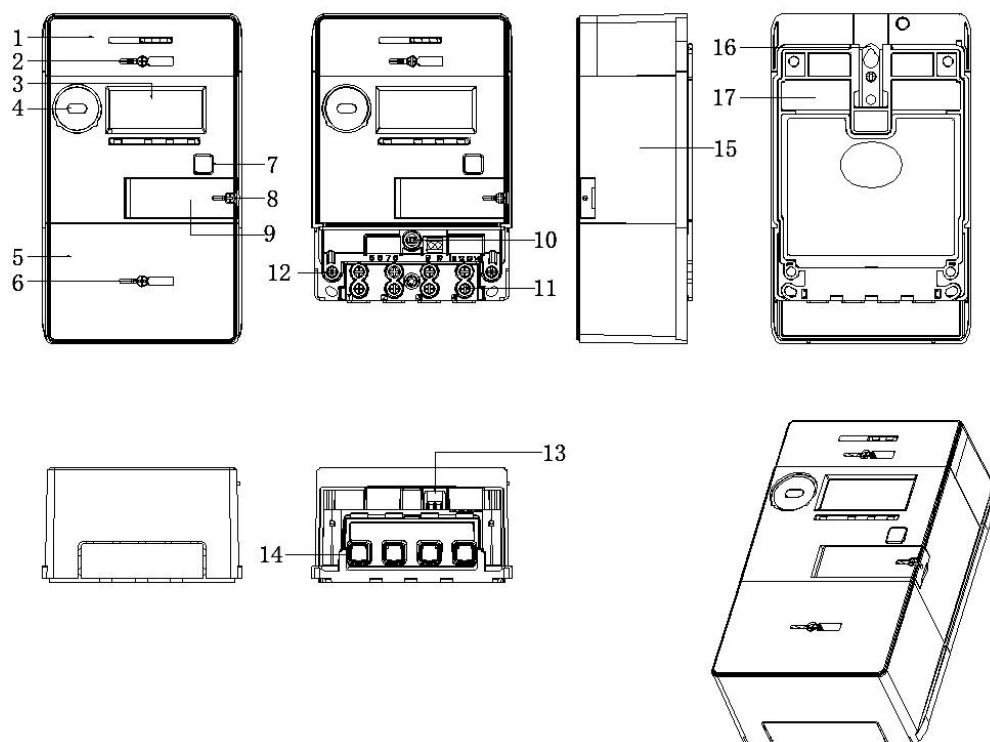
1.3 Operating Principle



Block diagram of the principle.

2 Structural Description

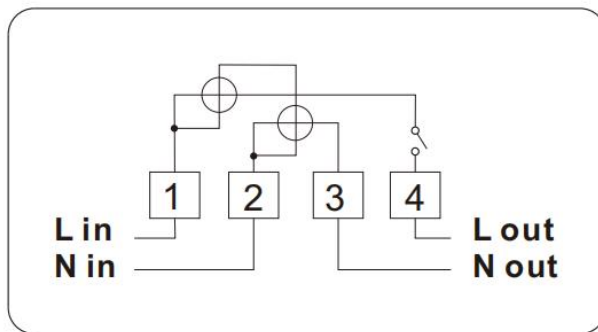
2.1 Structural Dimensions of the Energy Meter



Ref.	Component	Ref.	Component
01	Module Case	02	Module Case Lead Seal
03	LCD Viewing Window	04	Optical Port
05	Terminal Cover	06	Terminal Cover Lead Seal
07	Display Buttons	08	Battery Cover Lead Seal
09	Battery Cover	10	Cover Opening Detection
11	Cable Clamping Screws	12	Top Cover Lead Seal
13	RS485 Output Terminals	14	Current Terminals

15	Top Cover	16	Mounting Hook
17	Bottom Housing		

2.2 Wiring Diagram



Terminal description:

1: Phase line L in

4: Phase line L out

2: Neutral line N in

3: Neutral line N out

2.3 Meter Protection Level

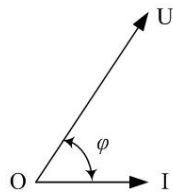
According to standard IEC60529 -- 4, the test results of the prepayment meter from Shenzhen Star Instrument Co., Ltd. are: IP54.

2.4 Flame Resistance Performance

Flame resistance class: V0 (the housing is entirely made of flame-retardant and heat-resistant material).

3 Measurement Principle

- Vector diagram of energy meter measurement.



- Active Power

$$P = UI \cos \varphi$$

- Active Energy:

$$E_p = \int P \, dt = \int UI \cos \varphi \, dt$$

- Energy direction defined by the meter:

Forward active energy = Active energy of quadrant I + quadrant IV

Reverse active energy = Active energy of quadrant II + quadrant III

Combined active energy = Sum of all four quadrants

4 Energy

The meter supports multiple types of energy measurement:

4.1 Basic Energy

Category	Measurement Object	IC	Identifier	Unit
Active Energy	Total and per tariff forward active energy	3	1-0:1.8.T.255	(0, Wh)
	Total and per tariff reverse active energy		1-0:2.8.T.255	
	Total combined active energy per tariff		1-0:15.8.T.255	
	Total net active energy per tariff		1-0:16.8.T.255	
Reactive Energy	Total and per tariff forward reactive energy	3	1-0:3.8.T.255	(0, varh)
	Total and per tariff reverse reactive energy		1-0:4.8.T.255	
	Total quadrant 1 reactive energy per tariff		1-0:5.8.T.255	
	Total quadrant 2 reactive energy per tariff		1-0:6.8.T.255	

	Total quadrant 3 reactive energy per tariff		1-0:7.8.T.255	
	Total quadrant 4 reactive energy per tariff		1-0:8.8.T.255	
	Combined reactive energy		1-0:17.8.T.255	
	Net reactive energy		1-0:18.8.T.255	
	Total inductive reactive energy per tariff		1-0:100.8.T.255	
	Total capacitive reactive energy per tariff		1-0:104.8.T.255	
Apparent Energy	Total forward apparent energy per tariff		1-0:9.8.T.255	(0, VAh)
	Total reverse apparent energy per tariff		1-0:10.8.T.255	

Note: "T" identifies the tariff: T=0 for total, T=1~N for specific tariffs.

4.2 Incremental Energy

Monthly Incremental Energy

Incremental monthly energy measurement objects supported by the energy meter, and their corresponding units/dimensions are shown in the following table:

Energy Category	Energy Object	IC	Object Identifier	Unit/Dimension
Active Energy	Total and per tariff monthly incremental forward active energy	3	1-0:1.9.T.255	(0, Wh)
	Total and per tariff monthly incremental reverse active energy		1-0:2.9.T.255	
	Total and per tariff monthly incremental combined active energy		1-0:15.9.T.255	
	Total and per tariff monthly incremental net active energy		1-0:16.9.T.255	
Reactive Energy	Total and per tariff monthly incremental forward reactive energy		1-0:3.9.T.255	(0, varh)

	Total and per tariff monthly incremental reverse reactive energy		1-0:4.9.T.255	
	Total and per tariff monthly incremental quadrant 1 reactive energy		1-0:5.9.T.255	
	Total and per tariff monthly incremental quadrant 2 reactive energy		1-0:6.9.T.255	
	Total and per tariff monthly incremental quadrant 3 reactive energy		1-0:7.9.T.255	
	Total and per tariff monthly incremental quadrant 4 reactive energy		1-0:8.9.T.255	
Apparent Energy	Total and per tariff monthly incremental forward apparent energy		1-0:9.9.T.255	(0, VAh)
	Total and per tariff monthly incremental reverse		1-0:10.9.T.255	

	apparent energy			
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Note:

In the object identifiers in the table above, T is the tariff number identifier:

T = 0: Indicates total energy.

T = 1~N: Indicates energy per tariff (where N is the total number of tariffs supported). For more details on the specific number of tariffs supported, refer to the chapter "Time-of-Use Tariffs".

Curve Cycle Incremental Energy

Energy Category	Active Energy	IC	Object Identifier	Unit/Dimension
Active Energy	Cycle incremental forward active energy	3	1-0:1.29.0.255	(1, Wh)
	Cycle incremental reverse active energy		1-0:2.29.0.255	
	Cycle incremental combined active energy		1-0:15.29.0.255	
	Cycle incremental net active energy		1-0:16.29.0.255	
Reactive Energy	Cycle incremental forward reactive energy	3	1-0:3.29.0.255	(1, varh)
	Cycle incremental reverse reactive energy		1-0:4.29.0.255	
	Cycle incremental quadrant 1		1-0:5.29.0.255	

	reactive energy			
	Cycle incremental quadrant 2 reactive energy		1-0:6.29.0.255	
	Cycle incremental quadrant 3 reactive energy		1-0:7.29.0.255	
	Cycle incremental quadrant 4 reactive energy		1-0:8.29.0.255	
Apparent Energy	Cycle incremental forward apparent energy		1-0:9.29.0.255	(1, VAh)
	Cycle incremental reverse apparent energy		1-0:10.29.0.255	

The meter supports the following curve cycle incremental energy measurement objects, with their corresponding units:

5 Demand

The meter supports demand calculation, with customizable period and number of cycles. The ranges and default values are:

Object	Configurable Range	Default Value
Demand Period	1~60 min	15 min
Number of Demand Periods	12	6

5.1 Current Demand

The current demand objects supported by the meter, along with their units, are:

Demand Category	Demand Object	IC	Object Identifier	Unit/Dimension
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Active Demand	Current forward active demand (total and per tariff)	5	1-0:1.4.T.255	(0, W)
	Current reverse active demand (total and per tariff)		1-0:2.4.T.255	
Reactive Demand	Current forward reactive demand (total and per tariff)		1-0:3.4.T.255	(0, var)
	Current reverse reactive demand (total and per tariff)		1-0:4.4.T.255	
	Current quadrant 1 reactive demand (total and per tariff)		1-0:5.4.T.255	
	Current quadrant 2 reactive demand (total and per tariff)		1-0:6.4.T.255	
	Current quadrant 3 reactive demand (total and per tariff)		1-0:7.4.T.255	
	Current quadrant 4 reactive demand (total and per tariff)		1-0:8.4.T.255	
Apparent Demand	Current forward apparent demand (total and per tariff)		1-0:9.4.T.255	(0, VA)
	Current reverse apparent demand (total and per tariff)		1-0:10.4.T.255	
Combined Demand	Current combined active demand		1-0:15.4.T.255	

Note:

In the identifiers in the table, "T" represents the tariff code:

T = 0: Total demand.

T = 1~N: Demand per specific tariff (refer to the chapter "Time-of-Use Tariffs" for the number of tariffs supported, N).

5.2 Maximum Demand

The meter supports the following maximum demand objects, with their corresponding units:

Demand Category	Demand Object	IC	Object Identifier	Unit/Dimension
Active Demand	Maximum forward active demand (total and per tariff)	4	1-0:1.6.T.255	(0, W)
	Maximum reverse active demand (total and per tariff)		1-0:2.6.T.255	
Reactive Demand	Maximum forward reactive demand (total and per tariff)		1-0:3.6.T.255	(0, var)
	Maximum reverse reactive demand (total and per tariff)		1-0:4.6.T.255	
	Maximum quadrant 1 reactive demand (total and per tariff)		1-0:5.6.T.255	
	Maximum quadrant 2 reactive demand (total and per tariff)		1-0:6.6.T.255	
	Maximum quadrant 3 reactive demand (total and per tariff)		1-0:7.6.T.255	
	Maximum quadrant 4 reactive demand (total and per tariff)		1-0:8.6.T.255	
Apparent Demand	Maximum forward apparent demand (total and per tariff)		1-0:9.6.T.255	(0, VA)
	Maximum reverse apparent demand (total and per tariff)		1-0:10.6.T.255	
Combined Demand	Maximum combined active demand		1-0:15.6.T.255	

Note:

In the identifiers in the table, "T" represents the tariff code:

T = 0: Total maximum demand.

T = 1~N: Maximum demand per specific tariff (refer to the chapter "Time-of-Use Tariffs" for the number of tariffs supported, N).

5.3 Demand Storage and Reset

When the meter reaches the monthly storage time (monthly settlement), the monthly maximum demand is automatically stored and then reset to start a new calculation. For details on the monthly settlement mechanism, refer to the chapter "Settlement".

(When the energy meter reaches the configured monthly transfer time (monthly settlement), the monthly maximum demand is automatically transferred and then cleared to restart calculation. For functions related to monthly settlement, refer to the chapter "Settlement".)

The meter supports button-activated settlement.

6 Instantaneous Values

The meter supports real-time measurement of instantaneous values.

6.1 Basic Values

Category	Object	IC	Object Identifier	Unit/Dimension
Voltage	Phase A	3	1-0:32.7.0.255	(-1, V)
Current	Phase A		1-0:31.7.0.255	(-2, A)
	Neutral		1-0:91.7.0.255	

Active Power	Forward (Phase A)		1-0:21.7.0.255	(0, W)
	Reverse (Phase A)		1-0:22.7.0.255	
	Combined		1-0:15.7.0.255	
Reactive Power	Forward		1-0:3.7.0.255	(0, var)
	Reverse		1-0:4.7.0.255	
	Quadrant 1		1-0:5.7.0.255	
	Quadrant 2		1-0:6.7.0.255	
	Quadrant 3		1-0:7.7.0.255	
	Quadrant 4		1-0:8.7.0.255	
Apparent Power	Forward		1-0:9.7.0.255	(0, VA)
	Reverse		1-0:10.7.0.255	
Power Factor	Forward		1-0:13.7.0.255	(-3, NULL)
	Phase A		1-0:33.7.0.255	
	Reverse	1-0:84.7.0.255		
Grid Frequency	Grid frequency	1-0:14.7.0.255	(-2, Hz)	

6.2 Other Instantaneous Quantities

The related objects and their units are shown in the following table:

Category	Object	IC	Object Identifier	Unit/Dimension
Battery Voltage	External battery voltage	3	0-0:96.6.3.255	(-3, V)

7 Clock

7.1 Clock Accuracy

The meter's clock complies with the requirements of standard IEC62054-21:

At reference temperature (23°C): Accuracy $\leq \pm 0.5$ s/day.

In the range of -25°C to +60°C: Accuracy $\leq \pm 1$ s/day.

When the meter loses power, the backup battery maintains clock accuracy.

7.2 Functions

- Calendar, timer, and automatic leap year adjustment.
- Remote clock adjustment via master software or master station.
- Broadcast synchronization.
- Supported date range: 2012-01-01 to 2099-12-31.
- Support for time zones.

8 Communications

8.1 Local Communication

The meter includes an optical communication port, compatible with the physical standard IEC62056-21 and the DLMS/COSEM protocol (HDLC mode).

It allows reading energy data, demand, events, and settlements, as well as configuring parameters via master software.

8.2 RS485 Communication

RS485 port compatible with HDLC protocol, used for concentrator networks and remote reading.

8.3 Remote Communication

Supports removable communication modules (DLMS/COSEM protocol, Wrapper and TCP/UDP).

Two AMI connection modes:

- 4G: Direct connection to master station.
- RF: Connection via DCU.

Functions:

- Remote data reading.
- Meter programming.
- Mode change.
- Prepayment recharge.
- Relay control.

All communications are encrypted.

9 HMI

9.1 Display Buttons

Display Buttons

Automatic mode: Short press to enter manual mode.

Manual mode: Short press to navigate pages.

Inactivity time: 10 seconds (adjustable between 1-60 s) to return to automatic mode.

9.2 Backlight

Activation: When any button is pressed (lasts 20 s by default, adjustable).

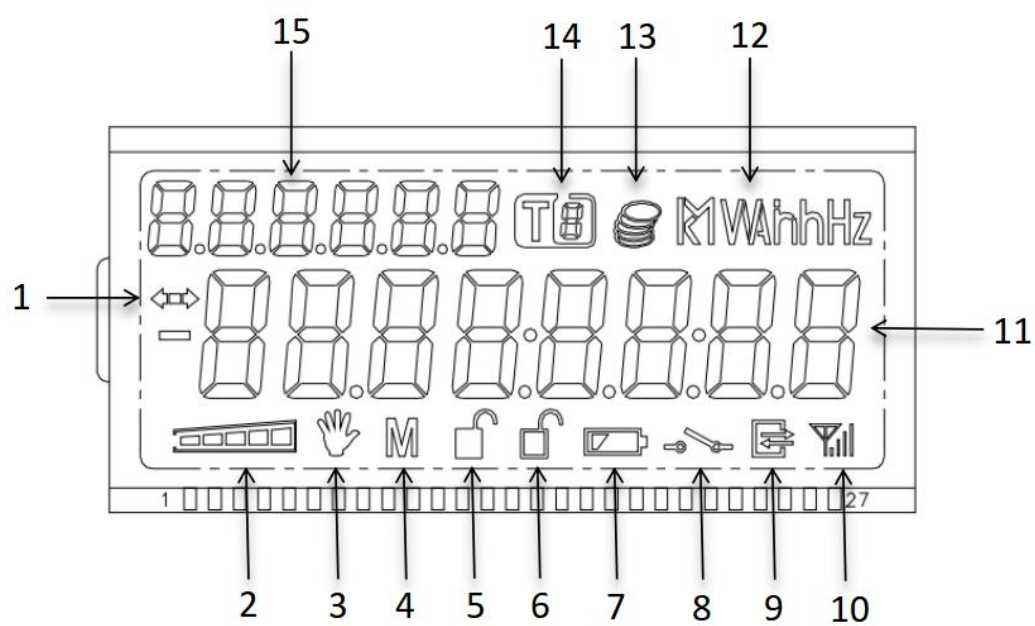
Configuration:

0: Disables backlight.

Other values: Custom off time.

9.3 LCD Display

Explanation of LCD Display Content



Ref.	Indicator Name	Description
1	Consumption Direction Indicator	Right arrow: forward consumption. Left arrow: reverse consumption. Disappears when no consumption.
2	Balance Level Bar	Shows real-time balance level.
3	Tamper Indicator	Tamper history: activates in case of bypass and persists after its end.
4	Reserved	Reserved
5	Cover Open Indicator	Activates when the cover is opened and disappears when closed.
6	Upper Cover Open Indicator	Activates when the upper cover is opened and disappears when closed.
7	Battery Indicator	Flashes if voltage <3.0V; disappears if ≥3.0V.
8	Relay Status	Shows "disconnected" when the relay is open; not shown in closed state.
9	Communication Indicator	Activates during communications.
10	4G Module Status	Shows signal strength and GPRS connection status.
11	Data Area	Displays data (e.g., date, serial number). Long data (>8 characters) are split into screens.
12	Units	Unit symbols (Wh, varh, V, A, etc.).
13	Currency Symbol	Only in prepayment mode (disabled by default).
14	Current Tariff	Indicates the active tariff code.
15	Data Identifier	Abbreviated object codes (e.g., "15.8.0").

4G Signal Indicator

Symbol State	Steady Light	Blinking
No display	Module not detected.	

	No signal (<-111 dBm)	SIM error
	Signal (-111 to -108 dBm): Connection established	Signal (-111 to -108 dBm): Connection not established
	Signal: -107 to -102 dBm, Connection established	Signal: -107 to -102 dBm, Connection not established
	Signal: -101 to -92 dBm, Connection established	Signal: -101 to -92 dBm, Connection not established
	Signal: ≥-91 dBm, Connection established	Signal: ≥-91 dBm, Connection not established

Automatic Rotation Display

When powered on with no operation, the meter enters automatic rotation display mode.

Parameter	Content				
Automatic Rotation Interval	1~60 seconds configurable, default 8 seconds				
Configurable Display Objects	Maximum 120				
Default Display List	Data Item	Class	OBIS	Attribute	Display Code
	Total Combined Active Energy	3	1-0:15.8.0.255	2	15.8.0
	Total Combined Active Energy T1	3	1-0:15.8.1.255	2	15.8.1
	Total Combined Active Energy T2	3	1-0:15.8.2.255	2	15.8.2
	Total Combined Active Energy T3	3	1-0:15.8.3.255	2	15.8.3
	Total Combined Active	3	1-0:15.8.4.255	2	15.8.4

	Energy T4				
	Total Inductive Reactive Energy	3	1-0:100.8.0.255	2	100.8.0
	L1 Phase Voltage	3	1-0:32.7.0.255	2	32.7.0
	L1 Phase Current	3	1-0:31.7.0.255	2	31.7.0
	Total Combined Forward Active Maximum Demand	3	1-0:15.6.0.255	2	15.6.0
	Total Combined Forward Active Maximum Demand T1	3	1-0:15.6.1.255	2	15.6.1
	Total Combined Forward Active Maximum Demand T2	3	1-0:15.6.2.255	2	15.6.2
	Total Combined Forward Active Maximum Demand T3	3	1-0:15.6.3.255	2	15.6.3
	Total Combined Forward Active Maximum Demand T4	3	1-0:15.6.4.255	2	15.6.4
	Total Combined Reactive Energy	3	1-0:17.8.0.255	2	17.8.0
	Total Combined Reactive Energy T1	3	1-0:17.8.1.255	2	17.8.1
	Total Combined Reactive Energy T2	3	1-0:17.8.2.255	2	17.8.2
	Total Combined Reactive Energy T3	3	1-0:17.8.3.255	2	17.8.3
	Total Combined Reactive Energy T4	3	1-0:17.8.4.255	2	17.8.4

Button Display

In automatic rotation display mode, short press the display button to enter button display mode.

Parameter	Content				
Return to Automatic Rotation Time	1~3600 seconds configurable, default 10 seconds				
Configurable Display Objects	Maximum 100				
Default Display List	Data Item	Class	OBIS	Attribute	Display Code
	Total Forward Active Energy	3	1-0:1.8.0.255	2	1.8.0
	Total Reverse Active Energy	3	1-0:2.8.0.255	2	2.8.0
	Total Forward Reactive Energy	3	1-0:3.8.0.255	2	3.8.0
	Total Reverse Reactive Energy	3	1-0:4.8.0.255	2	4.8.0
	Meter Number	1	0-0:96.1.0.255	2	C.1.0
	Date	8	1-0:0.9.2.255	2	0.9.2
	Time	8	1-0:0.9.1.255	2	0.9.1
	L1 Phase Forward Active Power	3	1-0:21.7.0.255	2	21.7.0
	L1 Phase Reverse Active Power	3	1-0:22.7.0.255	2	22.7.0
	L1 Phase Voltage	3	1-0:32.7.0.255	2	32.7.0
	L1 Phase Current	3	1-0:31.7.0.255	2	31.7.0
	L1 Phase Power Factor	3	1-0:33.7.0.255	2	33.7.0
	Total Forward Active Energy Maximum Demand	3	1-0:1.6.0.255	2	1.6.0
	Total Forward Active Energy Maximum Demand Occurrence Time	3	1-0:1.6.0.255	5	1.6.0

Power-off Display

Power-off Constant Display (default not enabled)

The meter does not enable power-off constant display by default.

When battery voltage is greater than 3.3V, the meter displays constantly during power-off; when battery voltage is below 3.3V, the meter does not display during power-off.

Power-off constant display hold time is configurable, range 0 seconds to 7 days, default no display during power-off.

Button Wake-up

The meter supports power-off button wake-up display function.

When battery voltage is below 3.3V and greater than 3.0V, the meter does not display during power-off.

Pressing the display button wakes up the LCD display; pressing the display button again switches to the next item in the automatic rotation list.

Wake-up time is configurable, default 60 seconds screen off when no operation.

Display Characteristics

- Energy defaults to no decimal, voltage and current default to 2 decimals, power defaults to 3 decimals, demand defaults to 3 decimals.

9.4 LED Indicators

Pulse Indicator Lights

- After no-load delay of 6s: corresponding pulse indicator light turns on.
- When applied power exceeds starting power, corresponding pulse light turns off and starts accumulating energy.
- Active light: Red LED, flashes when active power consumption occurs.
- Reactive light: Red LED, flashes when reactive power consumption occurs.

Alarm Indicator Light

- The meter supports alarm LED indication function.
- When an alarm event occurs, the alarm light flashes.
- When all alarm events end, the alarm light turns off.
- Tamper hand symbol: Bypass event has occurred.
- LED alarm events are as follows:

No.	Event
1	Cover opened
2	Upper cover opened
3	Magnetic field interference
4	Bypass

Credit/Power Indicator Light

Post-payment Mode

When powered on, the green light stays on as a power indicator.

10 Load Management

The meter supports load management function.

10.1 Limiter

The meter's Limiter function follows DLMS specifications:

- Limiter monitoring object can be set to power or current.
- Limiter supports normal threshold, emergency threshold, emergency curve settings, and supports current active threshold value indication.
- Limiter supports out-of-bounds occurrence determination time and end determination time settings.

10.2 Monitor

The meter's Monitor function follows DLMS specifications:

- Monitor object can be set to average power or average current.
- Monitor threshold is configurable.
- Monitor does not support fixed time settings, depends on the monitoring object's average period.

10.3 Load Control

The meter supports load control function. Overload (or overcurrent) handling is as follows:

- If overload (or overcurrent) duration reaches 60 seconds, the relay disconnects, and automatically reconnects after 1 minute (in relay mode 4, does not automatically reconnect).
- If overload (or overcurrent) relay disconnects consecutively for 3 times, the 4th time the relay disconnects, it can only automatically reconnect after 30 minutes (in relay mode 4, does not automatically reconnect).
- Overload (or overcurrent) lock time after exceeding times is configurable, default 30min.

11 Relay Control

The meter's Disconnect control function model follows DLMS specifications. The logical state, physical state, and control mode of the relay can be read via local communication and remote communication.

The meter control mode is configurable, default control mode is 4.

The meter supports local disconnection/reconnection, remote disconnection/reconnection, and manual disconnection/reconnection functions.

All disconnection/reconnection methods in various relay modes follow DLMS specifications.

11.1 Common Disconnection Reasons

No.	Disconnection Reason	Solution
1	Overcurrent/Overload	Reduce electrical load or contact power supply department
2	Overvoltage/Undervoltage	Contact power supply department for handling
3	Meter detects upper cover opened	Contact power supply department for handling

12 Settlement

The meter supports settlement function, used for electricity information collection and system billing.

12.1 Monthly Settlement

Note: T for monthly settlement objects: 1-3

Parameter	Content
Storage Capacity	13 times
Settlement Time	Configurable, default 1st of each month 00:00:00
Capture Object Capacity	Maximum 100
Default Capture Objects	Time stamp (8, 0-0:1.0.0.255)
	Total and per tariff forward active energy (3, 1-0:1.8.T.255)
	Total and per tariff reverse active energy (3, 1-0:2.8.T.255)
	Total and per tariff forward reactive energy (3, 1-0:3.8.T.255)

	Total and per tariff reverse reactive energy (3, 1-0:4.8.T.255)
	Total and per tariff combined active energy (3, 1-0:15.8.T.255)
	Total forward active energy increment (3, 1-0:1.9.0.255)
	Total reverse active energy increment (3, 1-0:2.9.0.255)
	Total forward reactive energy increment (3, 1-0:3.9.0.255)
	Total reverse reactive energy increment (3, 1-0:4.9.0.255)
	Total combined active energy increment (3, 1-0:15.9.0.255)
	Total and per tariff forward active maximum demand and occurrence time (4, 1-0:1.6.T.255)
	Total and per tariff reverse active maximum demand and occurrence time (4, 1-0:2.6.T.255)

12.2 Daily Settlement

Note: T for daily settlement objects: 1-3

Parameter	Content
Storage Capacity	31 days
Settlement Time	Configurable, default daily 00:00:00
Capture Object Capacity	Maximum 100
Default Capture Objects	Time stamp (8, 0-0:1.0.0.255)
	Total and per tariff forward active energy (3, 1-0:1.8.T.255)
	Total and per tariff reverse active energy (3, 1-0:2.8.T.255)
	Total and per tariff forward reactive energy (3, 1-0:3.8.T.255)
	Total and per tariff reverse reactive energy (3, 1-0:4.8.T.255)
	Total and per tariff combined active energy (3, 1-0:15.8.T.255)

13 Load Curve

The meter's load curve capture period is programmable, different load curves can be set with different periods.

The meter's load curve capture objects are programmable, different load curves can be set with different capture objects.

Load curve recorded data can be transmitted to the upper management system via communication interface or communication module, to draw user's load curve for more reasonable electricity management.

13.1 Load Curve 1

Parameter	Content
Storage Capacity	8928 records
Capture Period	Configurable, default 15min
Capture Object Capacity	Maximum 100
Default Capture Objects	Time stamp (8, 0-0:1.0.0.255)
	Load curve 1 status word (1, 0-0:96.10.1.255)
	Forward active power (3, 1-0:1.7.0.255)
	Reverse active power (3, 1-0:2.7.0.255)
	Forward reactive power (3, 1-0:3.7.0.255)
	Reverse reactive power (3, 1-0:4.7.0.255)
	Forward active energy (3, 1-0:1.8.0.255)
	Reverse active energy (3, 1-0:2.8.0.255)
	Forward reactive energy (3, 1-0:3.8.0.255)
	Reverse reactive energy (3, 1-0:4.8.0.255)
	Total forward active energy increment (3, 1-0:1.9.0.255)

	Total reverse active energy increment (3, 1-0:2.9.0.255)
	Total forward reactive energy increment (3, 1-0:3.9.0.255)
Total reverse reactive energy increment (3, 1-0:4.9.0.255)	

13.2 Load Curve 2

Parameter	Content
Storage Capacity	1560 records
Capture Period	Configurable, default 60min
Capture Object Capacity	Maximum 18
Default Capture Objects	Time stamp (8, 0-0:1.0.0.255)
	Load curve 2 status word (0, 0-0:96.10.2.255)
	Forward active maximum demand (3, 1-0:1.6.0.255)
	Reverse active maximum demand (3, 1-0:2.6.0.255)
	Forward reactive maximum demand (3, 1-0:3.6.0.255)
Reverse reactive maximum demand (3, 1-0:4.6.0.255)	

14 Events

The meter records the most recent events in each event group, including their occurrence date/time, in a first-in-first-out manner. Event records can be uploaded to the upper management computer via communication interface for display,

reporting, and corresponding handling by the power supply management department.

14.1 Event Grouping

Event grouping, recorded event count, and event capture objects are as follows:

Group	Maximum Count	Capture Objects
Standard Events	100	Time stamp, event code
Tamper Events	100	Time stamp, event code
Disconnection Events	100	Time stamp, event code
Power Quality Events	100	Time stamp, event code
Communication Events	100	Time stamp, event code
Long Power Failure Events	100	Time stamp, event code, last long power failure duration of any phase

14.2 Event Detection

Event Code	Event Name	Description	Detection Mechanism	Detection Threshold	Determination Time
7	Replace Battery	Battery needs replacement	Fixed 3.0V	Fixed 5 seconds	
76	Undervoltage L1	L1 phase undervoltage	Configurable; default 90%Un	Configurable; default 30 seconds	
79	Overvoltage L1	L1 phase overvoltage	Configurable; default 110%Un	Configurable; default 30 seconds	
82	Missing Voltage L1	L1 phase voltage loss	Configurable; default 45%Un	Configurable; default 30 seconds	

91	Current Reversal	Current reversal	Active power reverse, and active power value greater than $Un*2\%Ib$	Fixed 10 seconds	
/	Power Failure	Long power failure	Fixed 10%Un	Configurable, default 180 seconds	

14.3 Event Reporting

When the meter is equipped with a communication module, it supports active reporting of event information to the system end via the module.

The meter supports event supplementary reporting function. After power restoration, the meter can continue to complete previously unreported events due to power failure.

14.4 Event Configuration

- Event record enable/disable can be configured via upper computer.
- Event reporting enable/disable can be configured via upper computer.

15 PUSH

15.1 Data Reporting

The meter supports reporting of the most recent 1 load curve record, the most recent 1 daily settlement record, and the most recent 1 monthly settlement record.

16 Time-of-Use Tariffs

The meter supports TOU (Time-of-Use) tariff function. TOU parameters can be configured via upper computer:

Parameter	Maximum Number	Description
Special Holidays	100	Each special holiday points to a different daily schedule table.
Season Table	12	Each season table points to a different week table.
Week Table	8	Each week table points to a different daily schedule table.
Daily Schedule Table	8	Each daily schedule table defines different time periods corresponding to tariff numbers.
Daily Time Periods	12	
Tariffs	4	Each tariff can independently define different electricity prices.

The meter supports backup TOU parameters, which can be set via upper computer.

Backup tariff parameter activation time is configurable.

Default tariff:

Season Profile Name	Season Start Time	Week Name
1	FFFF-01-01-00:00:00	01
Week Profile Name	Mon. -> Sun.	
01	DT1 DT1 DT1 DT1 DT1 DT1 DT1	
day_profile_table_active	00:00	
DT1	T1	

17 Payment Mode

17.1 Post-payment Mode

The meter normally accumulates energy, does not perform deduction operations, and does not perform any relay operations. In post-payment mode, the balance indicator light is green and steady.

In post-payment mode, purchase tokens and clear balance tokens are not accepted.

18 Common Fault Handling

Fault Phenomenon	Cause Analysis	Handling Method
LCD no display	Power supply problem	1. Use a multimeter to check if there is voltage on the meter's voltage terminals. 2. Check if the voltage is connected according to the rated voltage on the meter nameplate.
LCD display missing segments, unclear	LCD damaged	Notify the manufacturer or agent to replace the LCD.
LCD not displaying, and pulse indicator light not flashing	Incorrect wiring, or voltage not within working range	1. Check if wiring is correct. 2. Check if voltage is within working range. 3. In no-load mode, pulse light stays on; when applied load exceeds starting power, pulse light turns off and starts accumulating energy.
Display normal, pulse indicator light not flashing when using electricity	Incorrect wiring or no load	1. Check if wiring is correct. 2. Confirm if the electricity current is less than 0.4%I _b .
Real-time measurement values 不符	Voltage and current wiring does not match wiring diagram	Check if voltage and current wiring is correct, if necessary use a high-precision multimeter and clamp meter to measure voltage and current signals;

		Also note if current wiring meets requirements, if incoming and outgoing lines are reversed.
	Working beyond range	The meter's voltage and current measurement range should not exceed 1.2 times the reference voltage and maximum current. If the measurement range seriously exceeds, it may cause inaccurate processing, and may even burn the meter. If the meter is found working beyond range, replace with a larger specification model or change to a wiring method with transformer ratio; if a meter with transformer ratio method exceeds range, consider replacing with a larger ratio transformer.
Battery symbol flashing on LCD	Battery undervoltage	Replace battery.
Communication unsuccessful	Communication bus wiring	Please check if the communication bus is reliable and wiring is correct.
	Communication data information problem	1. Check if communication settings (e.g., address, baud rate, parity) are correct. 2. Test by changing normal and abnormal communication addresses or installation locations to determine if it's a communication device or meter fault problem. 3. Check if the communication protocol between the meter and communication software is consistent.