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DC02NC-S1 Specification

75mV DC Energy Meter

Highly Compatible Communication: Supports MODBUS and DL/T 645 Protocols

Wide-Range Design: Covers 100V to 1000V DC voltage measurement

Bidirectional Energy Metering: Supports bidirectional metering for more application scenarios

More Options for Different Needs!



75mV DC Energy Meter

This model is suitable for DC charging piles, PV plants, energy storage, and other application scenarios

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Revision Date	Revision Description	Revised By
2026.6.5	Updated simplified template	Product Dept.

1. Product Overview

The DC02NC-S1 external-shunt smart DC energy meter is a new product series developed for DC metering applications such as DC charging piles, PV power plants, and energy storage systems. The DC02NC-S1 adopts an external shunt design and DIN-rail mounting, featuring a compact size, easy installation, and an attractive appearance. The whole series supports RS485 communication and multiple protocols. With high overall metering accuracy and rich functions, and compliance with multiple standards including IEC standards, it is an ideal choice for high-accuracy DC metering applications.

2. Main Features

- Comprehensive metering functions: forward and reverse energy metering;
- Accuracy Class 1;
- Multi-tariff and multi-time periods: support 4 tariffs and 8 time periods;
- Flexible communication: supports RS485 communication, compatible with Modbus and DL/T 645-2007 protocols; supports Ethernet communication;
- Backlit LCD display: shows voltage, current, energy, power, and other information; supports automatic scrolling, default interval 5s;
- Self-diagnosis, alarms, and safety protection functions;
- Line-loss energy compensation function;

3. Specifications

3.1. Electrical Parameters

Voltage Conn.	Direct connection
Rated Voltage	DC 100V-1000V
Voltage Tol.	From 0.8 to 1.15 Un
Input Imp.	40 MΩ
Overload	Continuous: 1.2 Un max.
Pulse Const.	1000imp/kWh

3.2. Current Parameters

Current Sampling	Shunt sampling: 75mV; supports up to 75mV:2000A
Current Conn.	External shunt

3.3. Measurement Accuracy

Voltage	± 1%
Current	± 1%
Power	± 1%
Energy	Class 1

3.4. Auxiliary Power Supply

Power Cons.	≤2W
Voltage	24-36VDC、230VAC

3.5. Communication Parameters

Comm. Interface	RS485, Ethernet
Protocol	RS485 compatible with Modbus RTU and DLT/645-2007; Ethernet uses http-json and http-ocmf protocols
Comm. Type	Bidirectional
RS485 Conn.	2-wire
Network Conn.	RJ45
RS485 Config	Modbus address (1 to 247) Baud rate (9.6/19.2/38.4/57.6/76.8/115.2 kbps) Parity (None/Odd/Even)
Refresh Time	≤100ms

3.6. Function Parameters

Metering Function	75mV shunt sampling; measures DC power, current, and voltage
Metering Mode	Absolute-value metering; forward/reverse metering
Tariff	Default 4 tariffs and 8 time periods; daylight saving time configurable
Self-Diagnosis	Memory self-diagnosis
Event Alarms	Overcurrent, overtemperature, magnetic field detection, low battery, etc.
Firmware Upgrade	Local upgrade; remote upgrade
Clock	Automatic network time synchronization; temperature compensation
Other Functions	Line loss compensation function

3.7. General Parameters

LCD Display	8+2 (dot-matrix)
LCD Refresh Time	1S
LED	Green: main metering chip normal Red/green alternately: abnormal communication, Solid red: overtemperature, overcurrent, or magnetic field alarm

Buttons	Page switching; settings
IP Rating*	IP20
Protection Class	Class II protection
Rated Impulse Voltage	9.6kV
Mounting Method	DIN rail mounting (3P)

*Note: This product series must be installed in a cabinet with IP54 protection (outdoor) or IP51 protection (indoor).

3.8. Environmental Parameters

Operating Temp.	-40~+70℃
Storage/Transit Temp.	-40~+70℃
Reference Temp.	25 ± 2℃
Relative Humidity	≤95%, non-condensing
Altitude	≤2000m

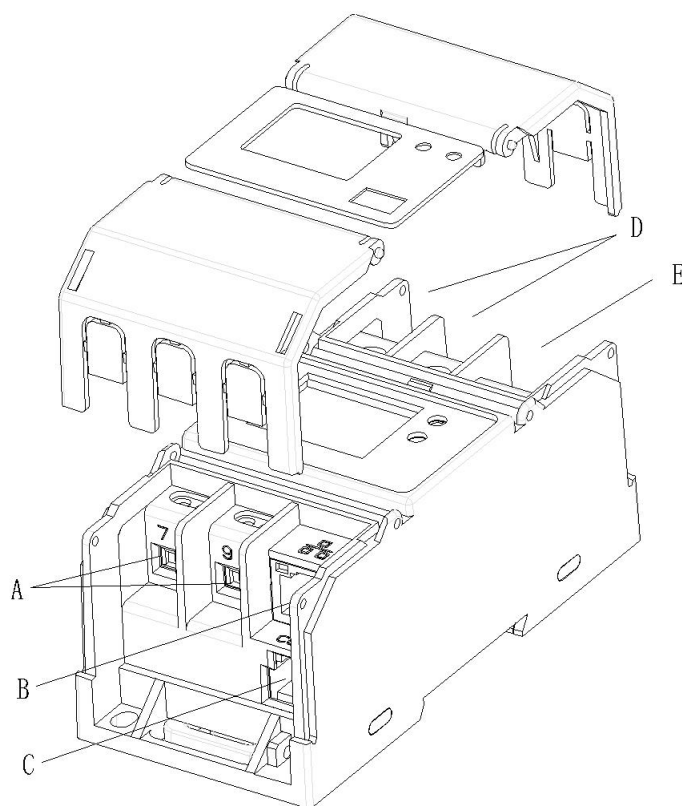
3.9. Standard Measuring Conditions

Ambient Temperature	25 ± 2℃
Shunt Sampling	75mV
Voltage	DC 100-1000V
Magnetic Field	Resistance to external magnetic field: 400mT (constant magnetic field)

3.10. Standards and Regulatory Certification

Compliant Standards	IEC 62052-11 IEC 62052-31 IEC 62053-41 EN 50470-4
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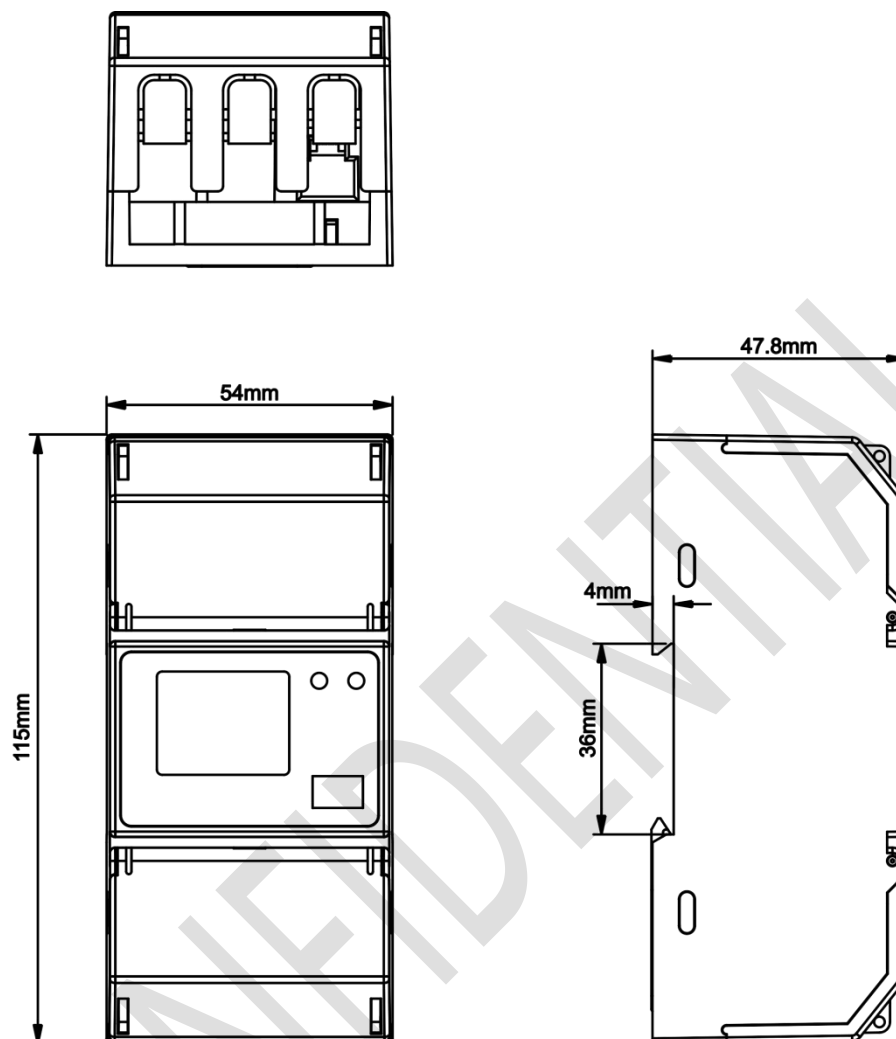
4. Structure



A Current Sampling B Network Port C RS485 Port D Voltage Sampling E Auxiliary Power

Area No.	Description
A	Current Sampling
B	Network Port
C	RS485 Communication Port
D	Voltage Sampling
E	Auxiliary Power Supply

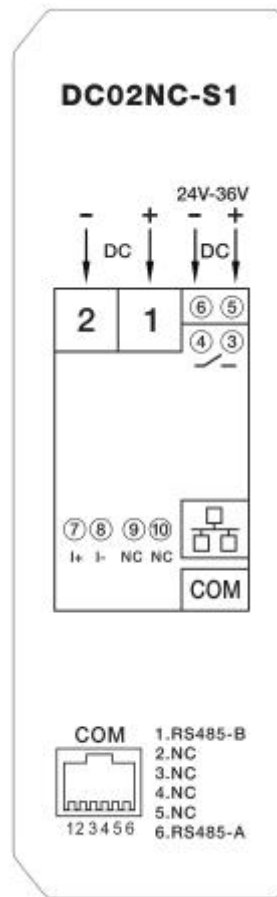
5. Dimensions



Housing Dimensions

54mm×115mm×47.8mm

6. Wiring



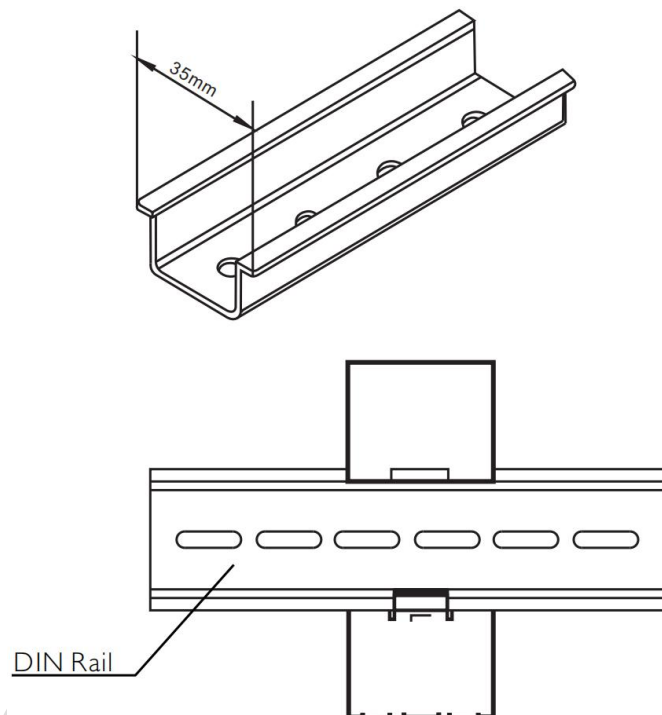
Note: When wiring terminals 3, 4, 5, 6, 7, and 8, the tightening torque should be controlled within 0.4 N·m. When wiring terminals 1 and 2, the tightening torque should be controlled within 1.5 N·m; otherwise thread stripping may occur.

- Terminals 1 and 2 are voltage sampling terminals.
- Terminals 3 and 4 are relay control signal terminals.
- Terminals 5 and 6 are auxiliary power supply terminals.
- Terminals 7 and 8 are a pair of current sampling terminals. The 75mV current sampling terminals must be connected to the millivolt sampling terminals of the external shunt, and the external shunt body must be connected in series in the measured main circuit. Do not connect the sampling wires separately without the shunt.
- In addition, the wiring diagram indicates the current measurement direction of the shunt, the Ethernet port, and RS485 communication.

7. Installation Instructions

35mm standard DIN rail mounting. The meter should be installed in an indoor or outdoor meter box.

- During installation, first hook the upper latch of the meter onto the rail. After confirming the upper latch is engaged, press the meter so that it snaps onto the rail and installation is complete. Note: Be sure to hook the upper latch onto the rail before pressing. Pressing directly may cause the upper latch of the meter to break!
- During removal, first pull down the lower DIN rail clip, then lift the lower part of the meter away from the rail. After the lower part is disengaged, push the meter upward to disengage the upper latch from the rail and complete removal. Note: Be sure to disengage the lower part of the meter from the rail before pushing upward to remove the meter. Forced removal may easily cause the upper latch of the meter to break!



8. Safety Instructions

8.1. Storage and Transportation

The energy meter shall not be subjected to severe impact during transportation and storage. It shall be transported and stored in accordance with GB 13384-2008 General Technical Requirements for Packaging of Instrumentation. The meter should be stored in its original packaging. The storage environment should have a temperature range of 0-40°C, relative humidity not exceeding 85%, and no corrosive gases in the air. When stored in a warehouse, the meters should be placed on racks,

with a stacking height not exceeding 10 boxes. After unpacking, individually packaged meters should not be stacked more than 5 layers.

8.2. Personal Safety Information

This manual does not include all safety measures for operation of this device (module/device), as special operating conditions, local codes, or local regulations may require further measures. However, it contains information that must be observed to protect personal safety and prevent equipment damage. Warnings are highlighted by warning triangles with exclamation marks or lightning symbols according to severity.



Indicates that failure to observe the instructions may result in death, serious injury, or significant damage.

8.3. Cautions



Indicates a risk of electric shock and that failure to take necessary safety precautions will result in death, serious injury, or considerable property damage.

8.4. Qualified Personnel

Installation and operation of the equipment described in this manual may only be performed by qualified personnel.

Only persons authorized to install, connect, and use this equipment, and who have appropriate knowledge of electrical equipment, grounding, and circuits, may be considered qualified personnel in this manual according to safety and regulatory standards.

8.5. Intended Use

The device (equipment/module) may only be used for the application cases specified in the catalog and user manual, and only in connection with equipment and components approved by YTL.

8.6. External Protection Requirements

This product does not integrate internal overcurrent protection. The user or installer is responsible for configuring an appropriate external overcurrent protection device on the power supply side. The selection and installation of this protection device shall comply with local electrical installation codes

and the expected short-circuit current conditions at the installation point.

8.7. Disclaimer

We have checked the contents of this publication and made every effort to ensure that the descriptions are as accurate as possible. However, deviations from the descriptions cannot be completely ruled out; therefore, no liability can be accepted for errors or omissions in the information provided.

The data in this manual is checked regularly, and necessary revisions will be made in subsequent versions. Please let us know if you have any suggestions.

Subject to technical modifications without prior notice.

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8.8. General Warning

After unpacking, check that the equipment is intact. If in doubt, do not use the device and contact technical personnel. Electrical installation must be carried out only by skilled electricians. Generally applicable safety measures must be observed.

If the device malfunctions and/or fails, switch it off immediately. Contact technical personnel for repair. Failure to comply with the above may endanger the safety of the device.

8.9. Additional Safety Installation Instructions

- All clamps should be properly tightened during installation, ensuring that wires are correctly inserted into the terminal clamps.
- If the conductor is too thin, poor contact may occur, potentially causing sparks and damaging the meter and surrounding environment.
- Ensure the conductors used are suitable for the maximum current of the meter.
- Before energizing/applying voltage to the meter, ensure the wires are correctly connected.
- Other rules not mentioned in this section that may affect the normal and safe use of the meter shall also be observed. To avoid accidents, installation must be performed by professional technical personnel.

9. Warranty

If the product is found to be non-conforming to technical specifications within 18 months, the manufacturer will repair and return products with intact seals.

9.1. Warranty Period Calculation

Warranty is handled according to the commercial invoice issued by our company and is calculated from the date the meter leaves the warehouse. The period is 18 months, excluding the time for

repair without spare parts and delivery.

9.2. Warranty Coverage

If the user strictly follows the transportation, storage, installation, and usage instructions for the energy meter, and the company seal remains intact (i.e., the meter seal has not been removed), if the energy meter fails to meet quality requirements, the user shall provide valid supporting materials (e.g., meter photos, certificate photos, local user feedback documents, relevant government department documents, etc.).

Under the following circumstances, we will repair, replace, or return the meter:

- No prior demonstration or explanation was provided;
- Does not conform to the implementation standards indicated on the product or its packaging;
- (If the standards on the product/packaging are required by the customer but do not conform to the company's product execution standards, the customer shall make the corresponding liability commitment);
- Does not conform to the quality condition indicated in the product manual, physical sample, etc.

Non-conforming meters shall be confirmed through consultation with the user. Generally, we will repair or replenish them in the next order. Special cases shall be determined through consultation between both parties.

Note: Quality assurance does not apply if there is no valid invoice, if evidence corresponding to the order quality issue cannot be provided, if damage is caused by force majeure, or if the warranty period has expired. However, repair may be accepted (transportation and other related costs shall be borne by the customer).

9.3. Technical Support

If there is any issue with our products, please contact:

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