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DC02ND Series Specification

Integrated DC Energy Meter (MID certified)

Highly Compatible Communication: All models support MODBUS and DL/T 645 protocols

Wide-Range Design: Covers 100V~1000V voltage measurement

Broad Product Range: 200A/400A/650A and other specifications available

Dual Auxiliary Power Options: DC24~36V and AC230V supply versions available

Bidirectional Energy Metering: Supports bidirectional energy metering for wider application needs

More Options for Different Needs!



Integrated DC Energy Meter

This meter has passed MID B+D certification

by UK SGS, proving its accuracy and quality.

This model can be used in DC charging piles, photovoltaic power stations, energy storage
and other applications.

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Date	Revision Description	By
2026.6.5	Simplified template updated synchronously	Product Dept.

1. Product Overview

The DC02ND Series direct-connected smart DC energy meter is designed for DC metering applications such as DC charging piles, photovoltaic power stations and energy storage systems. This series adopts an integrated design combining the shunt and the meter, and supports DIN-rail mounting, featuring a compact size and convenient installation. All models support RS485 communication and are compatible with multiple protocols. With excellent overall metering accuracy and diverse functions, the series is designed to meet MID, CPA, Eichrecht and other certification requirements (certification in progress), making it an ideal choice for high-precision DC metering applications.

2. Main Features

- Comprehensive metering functions: forward and reverse energy metering;
- Accuracy Class 1
- Multi-tariff and multi-time-period: support 4 tariffs and 8 time periods
- Flexible communication options: supports RS485 communication, compatible with Modbus and DL/T 645-2007 protocols; supports Ethernet communication
- Backlight LCD display: displays voltage, current, energy, power and other information; supports automatic scrolling, with a default interval of 5s
- Self-diagnosis, alarm and safety protection functions
- Line-loss energy compensation
- OCMF readings compliant with the S.A.F.E standard
- Compliant with German Eichrecht regulations (certification in progress)
- MID and CPA certifications (in progress)

Model	Basic Current (Ib)	Minimum Current (Imin)	Maximum Current (Imax)	Starting Current (Ist)	Auxiliary Power
DC02ND-200M	40A	2A	200A	160mA	AC230V
DC02ND-400M	80A	4A	400A	320mA	AC230V
DC02ND-650M	120A	6A	650A	480mA	AC230V
DC02ND-200M1	40A	2A	200A	160mA	DC24-36V
DC02ND-400M1	80A	4A	400A	320mA	DC24-36V
DC02ND-650M1	120A	6A	650A	480mA	DC24-36V

3. Specifications

3.1. Electrical Parameters

Volt. Conn.	Direct Connection
Rated Volt.	100V-1000V
Volt. Tol.	From 0.8 to 1.15 Un
Input Res.	40 MΩ
Pulse Const.	1000imp/kWh
Power Cons.	≤2W (without communication)

3.2. Current Parameters

Current Sample	200A, 400A and 650A options available
Current Conn.	Integrated

3.3. Measurement Accuracy

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

3.4. Auxiliary Power

Power Cons.	≤2W
Voltage	24-36VDC and 230VAC options available

3.5. Communication Parameters

Comm. Method	RS485, Ethernet
Protocol	RS485 compatible with Modbus RTU and DL/T 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 (master: 9.6/19.2/38.4/57.6/76.8/115.2 kbps) Parity (none/odd/even)
Refresh Time	≤100ms

3.6. Functional Parameters

Metering Function	Shunt sampling; measures DC power, current and voltage
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Metering Mode	Absolute-value metering, forward/reverse metering, dual-circuit metering (optional)
Tariff	4 tariffs and 8 time periods by default; daylight saving time configurable
Self-Diagnosis	Storage self-diagnosis
Event Alarm	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 and real-time shunt temperature monitoring

3.7. General Parameters

LCD Display	8+2 (dot-matrix)
LCD Refresh Time	1S
LED	Green: main metering chip normal Yellow: main/slave metering chips normal Red/green alternating: abnormal communication, Steady red: overtemperature, overcurrent or magnetic field warning
Button	Page turning, setting
IP Rating*	IP20
Protection Class	Class II protection
Rated Impulse Voltage	9.6kV
Installation Method	DIN-rail mounted (4.5P)

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

3.8. Environmental Parameters

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

3.9. Standard Measurement Conditions

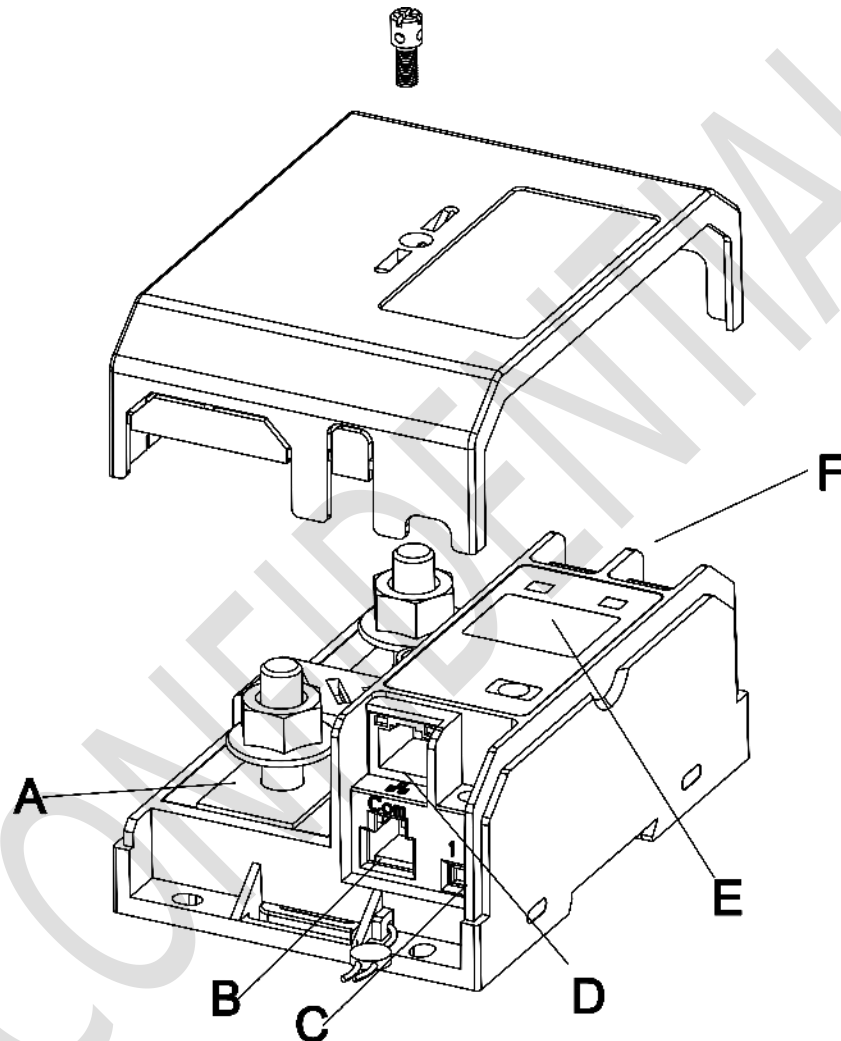
Ambient Temperature	25 ± 2℃
Current	40A/80A/120A
Voltage	DC 100-1000V
Magnetic Field	Resistance to external magnetic field: 400 mT (constant magnetic field)

3.10. Standards and Regulatory Certifications

Applicable Standards	IEC 62052-11: 2020 IEC 62052-31: 2015
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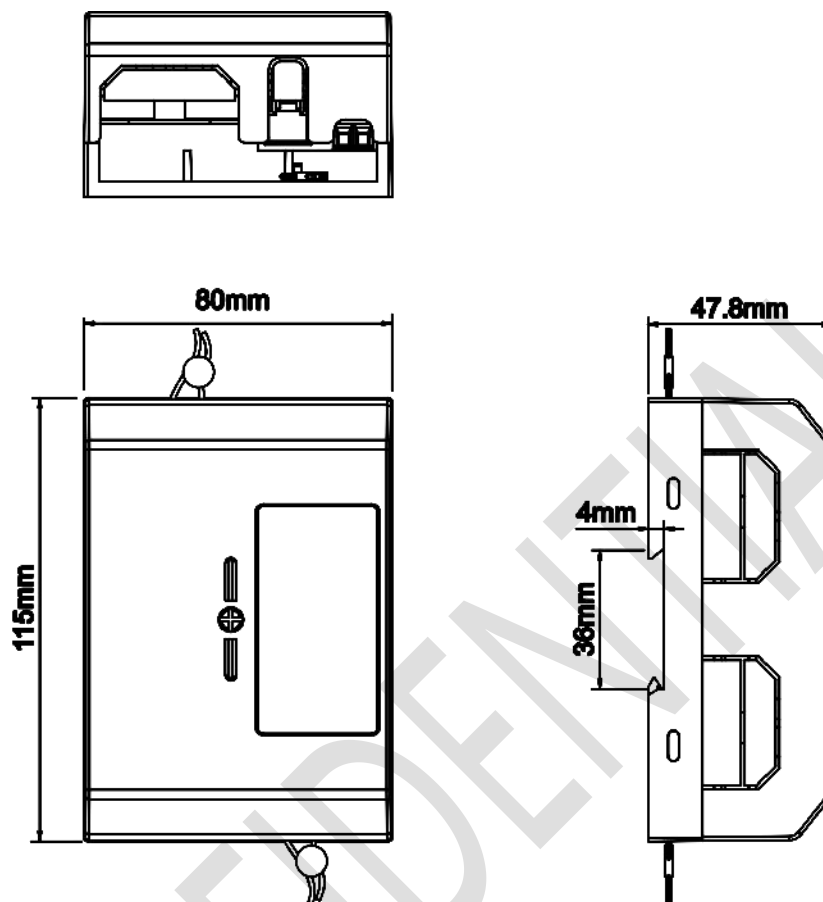
	IEC 62053-41: 2021 JJF 1779-2019 Program of Pattern Evaluation of Electronic DC Energy Meters GB/T 33708.3-2025 Static DC Energy Meters
Applicable Regulations	German Eichrecht regulations
Product Certifications	MID, PTB, CPA (certification in progress)

4. Structure



Area No.	Structure Description
A	Current Sampling
B	RS485 Communication Port
C	Auxiliary Power
D	Network Port
E	Display and LED
F	Voltage Sampling

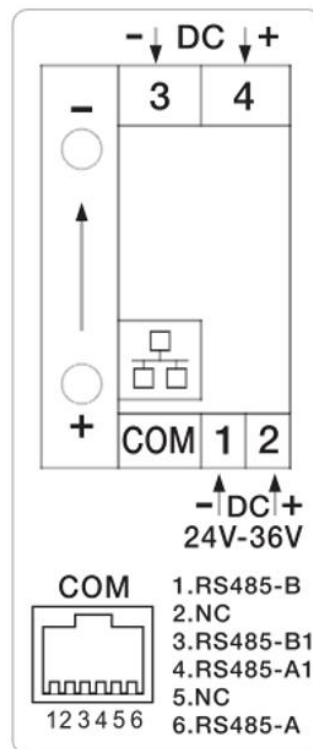
5. Dimensions



**Meter Case
Dimensions**

80mm×115mm×47.8mm

6. Wiring



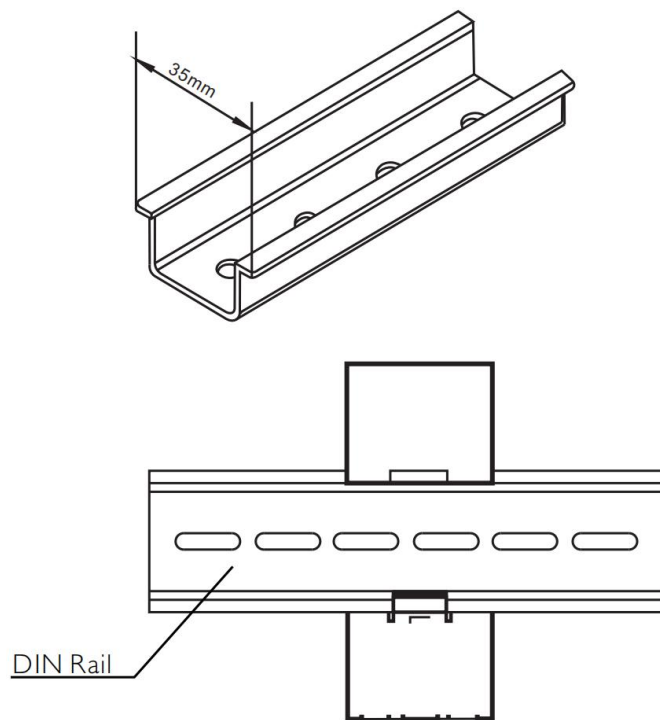
Note: For terminals 3 and 4, the tightening torque should be controlled within 0.4 N*m; for terminals 1 and 2, the tightening torque should be controlled within 1.5 N*m; otherwise thread stripping may occur.

- Terminals 1 and 2 are auxiliary power interfaces.
- Terminals 3 and 4 are voltage measurement interfaces.
- In addition, the wiring diagram indicates the shunt current measurement direction, Ethernet interface and RS485 communication.

7. Installation Instructions

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

- During installation, first engage the upper clip of the meter with the DIN rail. After confirming that the upper clip is engaged, press the meter so that it clips onto the rail and completes installation. Note: Always engage the upper clip with the DIN rail before pressing the meter. Direct pressing may cause the upper clip of the meter to break.
- During removal, first pull down the latch at the bottom of the rail, then lift the lower part of the meter away from the rail. After the lower part is separated from the rail, push the meter upward so that the upper clip disengages from the rail, and then complete removal. Note: Always separate the lower part of the meter from the rail before pushing it upward to remove the meter. Forced removal may easily cause the upper clip of the meter to break.



8. Safety Instructions

- According to Directive 2014/32/EU, the meter installation shall comply with mechanical environment "M1", with low shock and low vibration.
- According to Directive 2014/32/EU, the meter installation shall comply with electromagnetic environment "E2".

8.1. Storage and Transport

The energy meter must not be subjected to severe impact during transportation and storage, and shall be transported and stored in accordance with GB13384-2008 General Technical Requirements for Packaging of Instruments. The meter shall be stored in its original packaging. The storage environment shall have a temperature range of 0-40C, relative humidity not exceeding 85%, and air free of corrosive gases. When stored in a warehouse, meters shall be placed on racks, with a stacking height not exceeding 10 boxes. After unpacking, individually packaged meters shall be stacked no more than 5 layers high.

8.2. Personal Safety Information

This manual does not include all safety measures for the operation of this device (module/equipment), because special operating conditions, local code requirements or local regulations may require further measures. However, the information it contains must be observed to

protect personal safety and prevent equipment damage. Depending on the severity of the warning, warning triangles with an exclamation mark or lightning symbol are used for emphasis.



This means that failure to comply with the instructions may result in death, serious injury or major damage.

8.3. Cautions



This indicates an electric shock hazard, and failure to take the necessary safety precautions may result in death, serious injury or substantial material damage.

8.4. Qualified Personnel

The installation and operation of the device described in this manual may only be performed by qualified personnel.

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

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 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 a suitable 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 reviewed the contents of this publication and have made every effort to ensure that the descriptions are as accurate as possible. However, deviations from the descriptions cannot be completely ruled out, and therefore no liability can be accepted for any 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 changes without prior notice.

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8.8. General Warnings

After unpacking, ensure that the device is complete and 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. Be sure to contact technical personnel for repair. Failure to comply with the above requirements may endanger the safety of the device.

8.9. Supplementary Safety Installation Instructions

- During installation, all clamps shall be properly tightened to ensure that the wires can be correctly inserted into the connection clamps.
- If the conductor is too thin, poor contact may occur, which may generate sparks and damage the meter and its surroundings.
- Ensure that the conductors used are suitable for the maximum current of the meter.
- Before energizing/applying voltage to the meter, ensure that the AC wires are correctly connected.
- Other rules not mentioned in this chapter that may affect the normal and safe use of the meter shall also be observed. To avoid accidents, be sure to have installation performed by qualified technical personnel.

9. Warranty

If the product is found not to conform to the technical specifications within 18 months, the manufacturer will repair and return products with intact seals.

9.1. Warranty Period Calculation

Warranty shall be handled based on the commercial invoice issued by our company. The warranty period is 18 months from the date the meter leaves the warehouse, excluding the time for repair without spare parts and the delivery period.

9.2. Warranty Scope

If the user strictly follows the transportation, storage, installation and operating procedures of the energy meter, and the company seal remains intact (that is, the meter seal has not been removed), but the meter fails to meet the quality requirements, the user shall provide valid supporting materials, such as meter photos, certificate photos, local user feedback documents, documents from relevant government departments, etc.

The meter will be repaired, replaced or returned in the following cases:

- No demonstration was provided and no prior explanation was given;
 - It does not conform to the implementation standards indicated on the product or its packaging;
 - (If the standard on the product/packaging is required by the customer but does not conform to the company product implementation standard, the customer shall make the corresponding responsibility commitment);
 - It does not conform to the quality status indicated in the product manual, physical sample, etc.
- Nonconforming meters shall be handled 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: The quality guarantee does not apply if there is no valid invoice, if evidence corresponding to the order quality issue cannot be provided, if the damage is caused by force majeure, or if the warranty has expired. However, the product may be returned for repair (transportation and other related costs shall be borne by the customer).

9.3. Technical Support

If you have any questions about our products, please contact:

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