

AD1200

Three Phase DIN-RAIL Meter

Product Manual



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1. Overview

The AD1200 meter is a three phase four wire with RS485 din rail electronic meter. This meter complies with the standards of IEC62052-11 and IEC62053-21. It can measure the consumption of active/reactive energy. This meter has many advantages, such as good reliability, small volume, light weight and easy installation.

2 . Introduction

2.1 Device description

| Type | Connec tion | U_n | I_b (Imax) | f_n | Imp/ kWh | Accuracy Class | |
|--------|-----------------------|------------|--------------|-------------|-------------|----------------|-------|
| AD1200 | Direct connec t | 3*230/400V | 5(80)A | 50/6 0Hz | 1000 | Activ e | Cl. 1 |

2.2 Standards and References

The AD1200 meets and operates in accordance with the following Standards:

| | |
|-----------------------|---|
| IEC 62052-11- 2003 | Electricity metering equipment (A.C) – General requirements, tests, and test conditions – Part 11: Metering equipment |
| IEC 62053-21- 2003 | Electricity metering equipment (A.C) – Requirements – Part 21: Static meters for active energy (classes 1 and 2) |

2.3 Characteristics

- It has three phase active/reactive energy and positive and negative measurement, four tariffs.
- It can be set to five measurement modes according to the synthesis code.
- Maximum demand calculation.
- Press button can reset the energy.
- Holiday Tariff and Weekend Tariff Setting.

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3. Basic Parameters

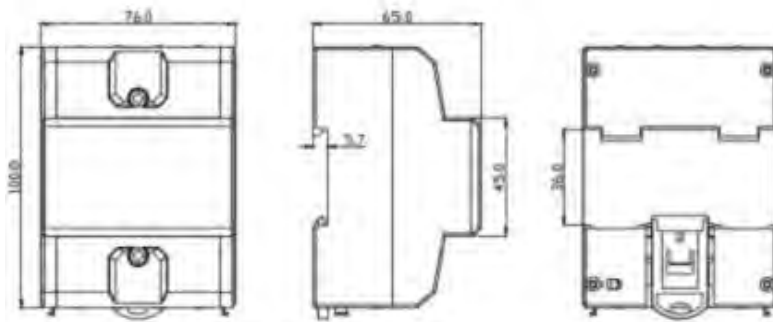
| Description | Values |
|--|--|
| Meter Type | Three phase, Four-Wire, Direct Connected |
| Accuracy | Active Class 1.0 (IEC 62053-21) |
| Nominal Voltage Un | 3*230 /400V |
| Current Range | 5 (80)A |
| Nominal Frequency fn | 50Hz |
| Starting Current | 0.2% In |
| Meter Constant | 1000 imp/kWh |
| Start-up Time | ≤ 5s |
| Power Consumption | Voltage circuit: ≤1W ,8VA Current circuit at Ib: ≤4VA |
| Operating Voltage Range | Nominal Operating Voltage: 0.9Un~1.1 Un Extended Operating Voltage: 0.8Un~1.15 Un |
| Specified operating temperature range | -20°C ~ +70°C |
| Limit operating temperature range | -25°C ~ +70°C |
| Limit Storage and transportation temperature range | -40°C ~ +70°C |
| Relative Humidity | ≤85% |
| Insulation | AC voltage test subjected to 4kV Impulse voltage test subjected to 6kV |

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4. Mechanical Construction

4.1 Outer Dimensions

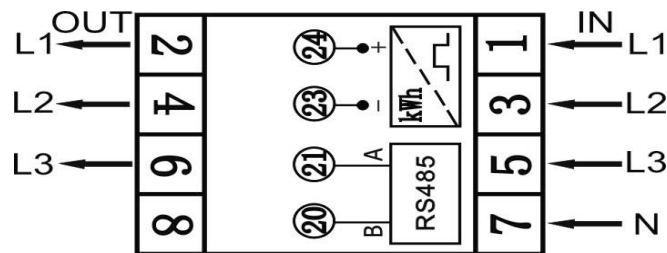


Height 100mm

Width 76mm

Depth 65mm

4.2 Wiring Diagram



5. Meter functions

5.1 Communication

The Meter supports both IR (near infrared) and RS485 communication. IR complies with EN62056(IEC1107) protocol, and RS485 communication use the MODBUS protocol.

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5.2 Button

The meter has two buttons, it can display all the contents by pressing the buttons. The meter can be set to the LCD scroll display time, reset the energy and backlight mode can be set by the buttons on the screen.

It can be settled the automatic display contents through IR.

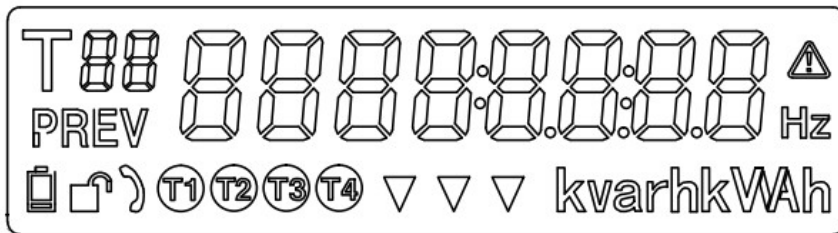
5.3 Backlight

Through the button setting, it can be divided into three modes: it is on when the button has been pressed, always on and always off.

5.4 Pulse output

Set 12000/1200/120/12, total four pulse output modes by communication.

5.5 LCD display content



5.5.1 Parameters show on the LCD screen

Some description to the signs



: Present tariff indication



: content indicate, it can be shown T1 /T2/T3/T4, L1/ L2/L3

Hz : frequencydisplay



: kWh unit display, it can show kW, kWh, kvarh, V, A and kVA.

Press the page button, and it will shift to another main page.

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| LCD Display Content | | | | |
|---------------------|--------------------------|-------|----------|---------------|
| Page | Content | Unit | LCD sign | Format |
| 1 | DATE | | | XX-XX-XX |
| 2 | TIME | | | XX:XX:XX |
| 3 | Total Active Energy | kWh | | 6+2 000000.00 |
| 4 | T1 Active Energy | kWh | T01 | 6+2 000000.00 |
| 5 | T2 Active Energy | kWh | T02 | 6+2 000000.00 |
| 6 | T3 Active Energy | kWh | T03 | 6+2 000000.00 |
| 7 | T4 Active Energy | kWh | T04 | 6+2 000000.00 |
| 8 | Total Reactive Energy | kVarh | | 6+2 000000.00 |
| 9 | T1 Total Reactive Energy | kVarh | T11 | 6+2 000000.00 |
| 10 | T2 Total Reactive Energy | kVarh | T12 | 6+2 000000.00 |
| 11 | T3 Total Reactive Energy | kVarh | T13 | 6+2 000000.00 |
| 12 | T4 Total Reactive Energy | kVarh | T14 | 6+2 000000.00 |
| 13 | L1 voltage | V | L1 | 3+1 000.0 |
| 14 | L2 voltage | V | L2 | 3+1 000.0 |
| 15 | L3 voltage | V | L3 | 3+1 000.0 |
| 16 | L1 current | A | L1 | 4+2 0000.00 |
| 17 | L2 current | A | L2 | 4+2 0000.00 |
| 18 | L3 current | A | L3 | 4+2 0000.00 |
| 19 | Total active power | kW | | 5+3 00000.000 |
| 20 | L1 active power | kW | L1 | 5+3 00000.000 |
| 21 | L2 active power | kW | L2 | 5+3 00000.000 |
| 22 | L3 active power | kW | L3 | 5+3 00000.000 |
| 23 | Total Apparent Power | kVA | | 5+3 00000.000 |
| 24 | L1 Apparent Power | kVA | L1 | 5+3 00000.000 |

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| | | | | |
|----|----------------------------------|-----|--|---------------|
| 25 | L2 Apparent Power | kVA | L2 | 5+3 00000.000 |
| 26 | L3 Apparent Power | kVA | L3 | 5+3 00000.000 |
| 27 | Total COS | | | 1+2 0.00 |
| 28 | L1COS | | L1 | 1+2 0.00 |
| 29 | L2COS | | L2 | 1+2 0.00 |
| 30 | L3COS | | L3 | 1+2 0.00 |
| 31 | Frequency | Hz | | 2+2 00.00 |
| 32 | T1 Demand | kW | T-1 | 6+2 000000.00 |
| 33 | T2 Demand | kW | T-2 | 6+2 000000.00 |
| 34 | T3 Demand | kW | T-3 | 6+2 000000.00 |
| 35 | T4 Demand | kW | T-4 | 6+2 000000.00 |
| 36 | Resettable Active Energy | kWh | Start measurement after function open, which can be reset. | 00000000 |
| 37 | Combinatorial active status word | | | S 00 000 |
| 38 | Cycle time | | 1-30s | Lcd-t 05 |
| 39 | Impulse Output | | | S0 1000 |
| 40 | Measuring Mode | | | COdE 01 |
| 41 | IR address/meter serial number | | IR address | ld 255 |
| 42 | MODBUS ID | | Address is 0x10 shows 016 | 12345678 |
| 43 | MODBUS Baudrate | | 485 Baudrate | bd 9600 |
| 44 | Software Version | | | V 0.01 |

5.6 System parameters address

| Meter ID (default) | Function Code | Register Address(Hex) | Register Address(Dec) | Contents | Register No. | Read/Write | Length | data mode |
|--------------------|---------------|-----------------------|-----------------------|------------------|--------------|------------|--------|-----------|
| 01 | 03 | 0000 | 0 | Serial number | 1 | Read | 4 | |
| 01 | 03 | 0002 | 2 | Meter ID | 2 | Read | 2 | |
| 01 | 03 | 0003 | 3 | Baud Rate | 3 | Read | 2 | |
| 01 | 03 | 0004 | 4 | Software Version | 4 | Read | 4 | float |
| 01 | 03 | 0006 | 6 | Hardware Version | 5 | Read | 4 | float |
| 01 | 03 | 0008 | 8 | CT Rate | 6 | Read | 2 | |
| 01 | 03 | 0009 | 9 | S0 output rate | 7 | Read | 4 | float |
| 01 | 03 | 000B | 11 | A3 | 8 | Read | 2 | |
| 01 | 03 | 000D | 13 | Cycle time | 10 | Read | 2 | |

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| | | | | | | | | |
|----|----|------|-----|------------------------|----|------|---|-------|
| 01 | 03 | 000E | 14 | L1 Voltage | 11 | Read | 4 | float |
| 01 | 03 | 0010 | 16 | L2 Voltage | 12 | Read | 4 | float |
| 01 | 03 | 0012 | 18 | L3 Voltage | 13 | Read | 4 | float |
| 01 | 03 | 0014 | 20 | Grid Frequency | 14 | Read | 4 | float |
| 01 | 03 | 0016 | 22 | L1 Current | 15 | Read | 4 | float |
| 01 | 03 | 0018 | 24 | L2 Current | 16 | Read | 4 | float |
| 01 | 03 | 001A | 26 | L3 Current | 17 | Read | 4 | float |
| 01 | 03 | 001C | 28 | Total Active Power | 18 | Read | 4 | float |
| 01 | 03 | 001E | 30 | L1 Active Power | 19 | Read | 4 | float |
| 01 | 03 | 0020 | 32 | L2 Active Power | 20 | Read | 4 | float |
| 01 | 03 | 0022 | 34 | L3 Active Power | 21 | Read | 4 | float |
| 01 | 03 | 0024 | 36 | Total reactive power | 22 | Read | 4 | float |
| 01 | 03 | 0026 | 38 | L1 reactive power | 23 | Read | 4 | float |
| 01 | 03 | 0028 | 40 | L2 reactive power | 24 | Read | 4 | float |
| 01 | 03 | 002A | 42 | L3 reactive power | 25 | Read | 4 | float |
| 01 | 03 | 002C | 44 | Total Apparent Power | 26 | Read | 4 | float |
| 01 | 03 | 002E | 46 | L1 Apparent Power | 27 | Read | 4 | float |
| 01 | 03 | 0030 | 48 | L2 Apparent Power | 28 | Read | 4 | float |
| 01 | 03 | 0032 | 50 | L3 Apparent Power | 29 | Read | 4 | float |
| 01 | 03 | 0034 | 52 | Total Power Factor | 30 | Read | 4 | float |
| 01 | 03 | 0036 | 54 | Power Factor | 31 | Read | 4 | float |
| 01 | 03 | 0038 | 56 | Power Factor | 32 | Read | 4 | float |
| 01 | 03 | 003A | 58 | Power Factor | 33 | Read | 4 | float |
| 01 | 03 | 0041 | 65 | CRC | 33 | Read | 2 | |
| 01 | 03 | 0042 | 66 | Combined Code | 33 | Read | 2 | |
| 01 | 03 | 0100 | 256 | Total Active Energy | 35 | Read | 4 | float |
| 01 | 03 | 0102 | 258 | L1 Total Active Energy | 36 | Read | 4 | float |

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| | | | | | | | | |
|----|----|------|-----|----------------------------|----|------|---|-------|
| 01 | 03 | 0104 | 260 | L2 Total Active Energy | 37 | Read | 4 | float |
| 01 | 03 | 0106 | 262 | L3 Total Active Energy | 38 | Read | 4 | float |
| 01 | 03 | 0108 | 264 | Forward Active Energy | 39 | Read | 4 | float |
| 01 | 03 | 010A | 266 | L1 Forward Active Energy | 40 | Read | 4 | float |
| 01 | 03 | 010C | 268 | L2 Forward Active Energy | 41 | Read | 4 | float |
| 01 | 03 | 010E | 270 | L3 Forward Active Energy | 42 | Read | 4 | float |
| 01 | 03 | 0110 | 272 | Reverse Active Energy | 43 | Read | 4 | float |
| 01 | 03 | 0112 | 274 | L1 Reverse Active Energy | 44 | Read | 4 | float |
| 01 | 03 | 0114 | 276 | L2 Reverse Active Energy | 45 | Read | 4 | float |
| 01 | 03 | 0116 | 278 | L3 Reverse Active Energy | 46 | Read | 4 | float |
| 01 | 03 | 0118 | 280 | Total Reactive Energy | 47 | Read | 4 | float |
| 01 | 03 | 011A | 282 | L1 Reactive Energy | 48 | Read | 4 | float |
| 01 | 03 | 011C | 284 | L2 Reactive Energy | 49 | Read | 4 | float |
| 01 | 03 | 011E | 286 | L3 Reactive Energy | 50 | Read | 4 | float |
| 01 | 03 | 0120 | 288 | Forward Reactive Energy | 51 | Read | 4 | float |
| 01 | 03 | 0122 | 290 | L1 Forward Reactive Energy | 52 | Read | 4 | float |
| 01 | 03 | 0124 | 292 | L2 Forward | 53 | Read | 4 | float |

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| | | | | | | | | |
|----|----|------|-----|----------------------------|----|-------|---|-------|
| | | | | Reactive Energy | | | | |
| 01 | 03 | 0126 | 294 | L3 Forward Reactive Energy | 54 | Read | 4 | float |
| 01 | 03 | 0128 | 296 | Reverse Reactive Energy | 55 | Read | 4 | float |
| 01 | 03 | 012A | 298 | L1 Reverse Reactive Energy | 56 | Read | 4 | float |
| 01 | 03 | 012C | 300 | L2 Reverse Reactive Energy | 57 | Read | 4 | float |
| 01 | 03 | 012E | 302 | L3 Reverse Reactive Energy | 58 | Read | 4 | float |
| 01 | 06 | 0002 | 2 | Meter ID | 1 | Write | 2 | |
| 01 | 06 | 0003 | 3 | Baud Rate | 2 | Write | 2 | |
| 01 | 10 | 0009 | 9 | SO OUTPUT | 4 | Write | 4 | float |
| 01 | 06 | 0042 | 66 | Combined Code | 5 | Write | 2 | |
| 01 | 06 | 000D | 13 | Cycle time | 7 | Write | 2 | |

6. Installation Instruction

6.1 Installation instructions

Installation staff should be experienced electrician or specialized person, and should ensure that they have read this user guide.

During installation, if it comes across severe strike or falling, which causes obvious damage trace, don't install it or turn it on. Please contact us in time.

Before leaving our factory, all the meters have been checked out and lead sealed, they can be installed directly.

Meters should be installed indoors or outdoors in a cabinet. The wall which is installed should be firm and fireproof, besides, no corrosive gas in the air.

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Meters should be installed according to the wiring diagram on terminal box. When inserting, using copper wire or copper connector will be better.

6.2 Installation instruction details

* Choose 35mm standard Din-Rail (the length is confirmed by yourself), fixed them in the location which are waiting for installation;

* Push down the clip under the bottom of the meter for a gear, see fig. 1 and fig.2;

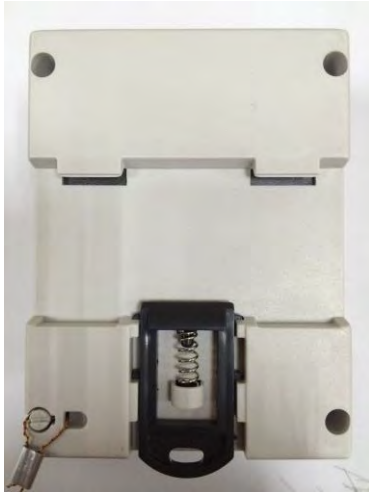


Fig.1



Fig.2

* Put the meter into the Din-rail as per Fig. 3, then push up the clip for a gear, install meter to the Din-rail, see Fig. 4;



Fig. 3

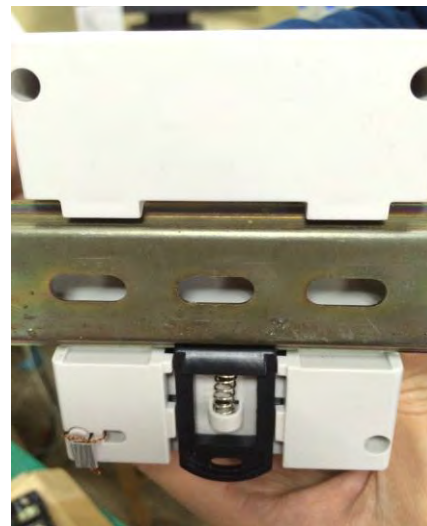


Fig. 4

* Making the connection according to the wiring diagram;

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* After connection, use lead sealing to seal terminal cover.

Recommended wire (For your reference) :

| Safe carrying capacity of rubber or plastic insulated wire (1) | | | | | |
|--|---|------------------------------|-----|-----|-----|
| specification (mm) | nominal cross section (mm ²) | Safe carrying capacity (A) | | | |
| | | BX | BLX | BV | BLV |
| 1*1.13 | 1 | 20 | | 18 | |
| 1*1.37 | 1.5 | 25 | | 22 | |
| 1*1.76 | 2.5 | 33 | 25 | 30 | 23 |
| 1*2.24 | 4 | 42 | 33 | 40 | 30 |
| 1*2.73 | 6 | 55 | 42 | 50 | 40 |
| 7*1.33 | 10 | 80 | 55 | 75 | 55 |
| 7*1.76 | 16 | 105 | 80 | 100 | 75 |
| 7*2.12 | 25 | 140 | 105 | 130 | 100 |
| 7*2.50 | 35 | 170 | 140 | 160 | 125 |
| 19*1.83 | 50 | 225 | 170 | 205 | 150 |

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| | | | | | |
|---------|----|-----|-----|-----|-----|
| 19*2.14 | 75 | 280 | 225 | 255 | 185 |
| 19*2.50 | 95 | 340 | 280 | 320 | 240 |

Note : BX (BLX) copper (aluminum) core rubber insulated wire or BV (BLV) copper (aluminum) core PVC plastic insulated wire , widely used in 500V or less than 500V AC and DC power distribution system. The temperature for the data listed in the above table is 35°C、the safe carrying capacity value for the wire on single covered.

7. Safety Instructions

Information for Your Own Safety

This manual does not contain all of the safety measures for operation of this equipment (module, device) because special operating conditions, local code requirements or local regulations may necessitate further measures. However, it does contain information which must be adhered to for your own personal safety and to avoid damage to the equipment. This information is highlighted by a warning triangle with an exclamation mark or a lightning bolt depending on the severity of the warning.



Warning

Means that failure to observe the instruction can result in death, serious injury or considerable material damage.



Caution

Means hazard of electric shock and failure to take the necessary safety precautions will result in death, serious injury or considerable material damage.

Qualified personnel

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

Only people that are authorized to install, connect and use this equipment and have the proper knowledge about labeling and grounding electrical equipment and circuits and can do so according to safety and regulatory standards are considered qualified personnel in the manual.

Use for the intend purpose

We have checked the contents of this publication and every effort has been made to ensure that the descriptions are as accurate as possible. However, deviations from the description cannot be completely ruled out, so that no liability can be accepted for any errors or omissions in the information given. The data in this manual is checked regularly and the necessary corrections will be included in subsequent editions. If you have any suggestions, please let us know.

General Warning

After removing the packaging make sure the integrity of the unit. If in doubt don't use the equipment and contact technical staff.

Mounting of electric appliances must be carried out only by skilled electricians. It is imperative to observe the generally applicable safety measures.

In case of failure and /or malfunctioning of the device, turn off it. For any repair only contact technical staff. Failure to comply with the above may compromise the device safety.

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