

SDM120 SERIES

Single phase two wire DIN rail energy meter
(One module)



User manual

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1.1 Safety instructions

Information for Your Own Safety

This manual does not contain all of the safety measures operating the equipment (module, device) for different conditions and requirements. However, it does contain information which you must know for your own safety and to avoid damages. This information is highlighted by a warning triangle indicating the degree of potential danger.



Warning

It means that failure to follow the instruction can result in death, serious injury or considerable material damage.



Caution

It 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

Operation of the equipment (module, device) described in this manual may only be performed by qualified personnel. Qualified personnel in this manual means person who are authorized to commission, start up, ground and label devices, systems and circuits according to safety and Regulatory standards.

Use for the intended purpose

The equipment (device, module) may only be used for the application specified in the catalogue and the user manual, and only be connected with devices and components recommended and approved by Eastron.

Proper handling

The prerequisites for perfect, reliable operation of the product are proper transport, proper storage, installation and proper operation and maintenance. When operating electrical equipment, parts of this equipment automatically carry dangerous voltages. Improper handling can therefore result in serious injuries or material damage.

- ✧ Use only insulating tools.
- ✧ Do not connect while circuit is live (hot).
- ✧ Do not connect the meter to a 3 phase - 400VAC – network.
- ✧ Place the meter only in dry surroundings.
- ✧ Do not mount the meter in an explosive area or expose the meter to dust, mildew and insects.
- ✧ Make sure the wires are suitable for the maximum current of this meter.
- ✧ Make sure the AC wires are connected correctly before activating the current/voltage to the meter.
- ✧ Do not touch the meter connecting clamps directly with metal, blank wire and your bare hands as you may get electrical shock.
- ✧ Make sure the protection cover is placed after installation.
- ✧ Installation, maintenance and reparation should only be done by qualified personnel.
- ✧ Never break the seals and open the front cover as this might influence the function of the meter, and will cause no warranty.
- ✧ Do not drop, or allow strong physical impact on the meter as the high precisely components inside may be damaged.

Disclaimer

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 contained in the information given. The data in this manual is checked regularly and the necessary corrections are included in subsequent editions. We are grateful for any improvements that you suggest.

1.2 Foreword

Thank you for purchasing the Eastron SDM120 series DIN rail single phase two wire energy meter. With the Eastron product range we have provided a large scale of energy meters on the market suitable for 110V AC to 400V AC (50 or 60Hz). SDM120 series are only 1 module (17.5mm) width, ensuring a high accuracy class (better than Class1), a very low starting current which makes it exceptionally suitable for sub-metering system and general use.

1.3 Performance criteria:

| | |
|--|---------------|
| Operating humidity | ≤ 85% |
| Storage humidity | ≤ 95% |
| Operating temperature | -20°C - +50°C |
| Storage temperature | -30°C - +70°C |
| International standard | IEC 62053-21 |
| Accuracy class | 1 |
| Protection against penetration of dust and water | IP51 |
| Insulating encased meter of Protective class | II |

1.4 Specifications:

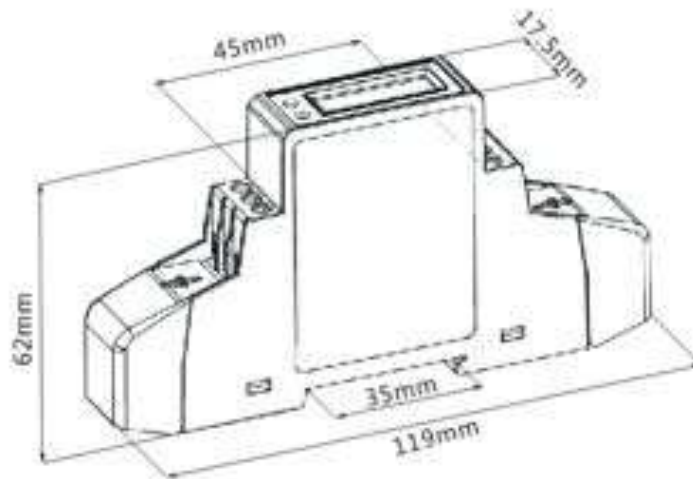
| | |
|----------------------------------|---|
| Meter type | SDM120A (Mechanical register display) SDM120D (LCD display) SDM120DB (LCD with backlit) |
| Nominal voltage (Un) | 230V AC |
| Operational voltage | 161 - 300V AC |
| Insulation capabilities: | |
| - AC voltage withstand | 2KV for 1 minute |
| - Impulse voltage withstand | 6KV – 1.2μS waveform |
| Basic current (Ib) | 5A |
| Maximum rated current (Imax) | 45A |
| Operational current range | 0.4% Ib- Imax |
| Over current withstand | 30Imax for 0.01s |
| Operational frequency range | 50Hz ±10% |
| Internal power consumption | ≤2W / 10VA |
| Test output flash rate (RED LED) | 1000imp/kWh (2000imp/kWh optional) |
| Pulse output rate (pins 6 & 7) | 1000imp/kWh (2000imp/kWh optional) |
| Consumption indicator (RED LED) | Flashing at load running |

1.5 Basic errors:

| | | |
|--------------------------|-------------|-------|
| 0.05Ib | Cosφ = 1 | ±1.5% |
| 0.1Ib | Cosφ = 0.5L | ±1.5% |
| | Cosφ = 0.8C | ±1.5% |
| 0.1Ib - I _{max} | Cosφ = 1 | ±1.0% |
| 0.2Ib - I _{max} | Cosφ = 0.5L | ±1.0% |
| | Cosφ = 0.8C | ±1.0% |

1.6 Dimensions and material**Material**

| | |
|------------------|--------------------------------|
| Case | PC alloy inflammable retarding |
| Protection cover | PC alloy inflammable retarding |
| Clamp | Nylon |

**1.7 Installation**

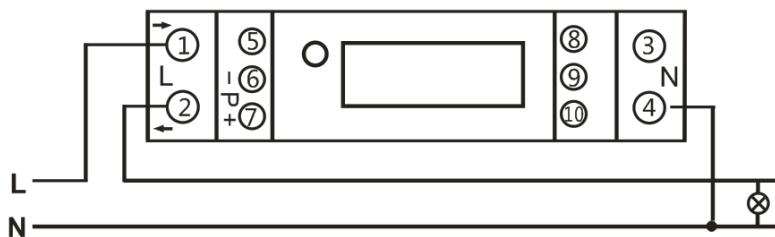
⚠ CAUTION

- ◆ Turn off all the power before working on it.
- ◆ Always use a properly rated voltage sensing device to confirm that power is off.

⚠ WARNING

- ◆ Installation should be performed by qualified personnel familiar with related procedures and regulations.
- ◆ Use insulating tools to install the meter.
- ◆ Fuse or thermal cut-off or single-pole circuit breaker can't be fitted on the supply line and not the neutral line.
- ◆ The case is sealed, do not broken it

- ◇ We recommend that the connecting wire which is used to connect the meter to the outside circuit should be sized according to local codes and regulations for the capacity of the circuit breaker or over current device used in the circuit.
- ◇ An external switch or a circuit-breaker should be installed on the inlet wire, which will be used as a disconnection device for the meter. And there it is recommended that the switch or circuit-breaker is near the meter so that it is more convenience for the operator. The switch or circuit-breaker should comply with the specifications of the building electrical design and all local regulations.
- ◇ An external fuse or thermal cut-off which will be used as a over-current protection device for the meter must be installed on the supply side wire, and it is recommended that the over-current protection device is near the meter so that it is more convenience for the operator. The over-current protection device should comply with the specifications of the buildings electrical design and all local regulations.
- ◇ This meter can be installed indoor directly, or in a meter box which is waterproof outdoor, subject to local codes and regulations.
- ◇ To prevent tampering, secure the meter with a padlock or a similar device.
- ◇ The meter has to be installed against a wall which is fire resistant.
- ◇ The meter has to be installed in a good ventilated and dry place.
- ◇ The meter has to be installed in a protection box when placed in dangerous or dusty environment.
- ◇ The meter can be installed and used after being tested and sealed with a letter press printing.
- ◇ The meter can be installed on a 35mm DIN rail.
- ◇ The meter should be installed in an available height so that it is easy to read.
- ◇ When the meter is installed in an area with frequent surges due to e.q. thunderstorms, welding machines, inverters etc, protect the meter with Surge Protection Devices.
- ◇ After finishing installation, the meter must be sealed to prevent tampering.
- ◇ Connection of the wires should be done in accordance with the underneath connection diagram.



Terminal 1 : L-in Terminal 2: L-out
 Terminals 3 & 4: Neutral
 Terminal 6 & 7 : Pulse output

1.8 Operating

Consumption indication

There is a LED on front panel, which flashes when consumption happens. The more quickly LED flashes, the more consumption happens. The constant of the LED is 1000imp/kWh.

Reading the meter

The SDM120A energy meter is equipped with a 5+1 register. Five integers are marked with black color and one decimal is marked with red. The SDM120D series energy meter is equipped with 6 digits LCD display which is used as recording consumption and can't be reset to zero. Before the accumulated reading goes to 10,000kWh, the LCD shows in xxxx.xx (4 integrals+2 decimals). After the reading reaches to 10,000kWh, the LCD shows in xxxxx.x (5 integrals + 1 decimal). The Max. reading is 99999.9kWh.

Pulse output

The SDM120 Series DIN rail energy meter is equipped with a pulse output which is fully separated from the inside circuit. That generates pulses in proportion to the measured energy for accuracy testing. The pulse output is a polarity dependant, passive transistor output requiring an external voltage source for correct operation. For this external voltage source, the voltage (U_i) should be 5-27V DC, and the maximum input current (I_{imax}) is 27mA DC. To connect the impulse output, connect 5-27V DC to connector 7 (anode), and the signal wire (S) to connector 6 (cathode).