

Virone EM-2

Virone EM-2 Digital AC Energy Meter User Manual

Model: EM-2

1. INTRODUCTION

The Virone EM-2 is a single-phase digital AC energy meter designed to measure active power consumption in a single-phase system. It displays data in metric units (kWh) on an LCD screen. An internal electronic system processes current and voltage to generate pulses, the number of which is proportional to the energy consumed. A flashing LED indicates energy consumption in real-time. The meter is suitable for installation on a DIN TH-35 mm rail.

This manual provides essential information for the safe and efficient installation, operation, and maintenance of your Virone EM-2 energy meter. Please read it thoroughly before use and retain it for future reference.

2. SAFETY INFORMATION

- Installation and maintenance should only be performed by qualified personnel in accordance with local electrical codes and regulations.
- Always disconnect power to the circuit before installing, servicing, or removing the meter to prevent electric shock.
- Do not operate the meter if it appears damaged or if its housing is open.
- Ensure all connections are secure and properly insulated to prevent short circuits and electrical hazards.
- The device is designed for indoor use in dry conditions. Avoid exposure to moisture, dust, or extreme temperatures.

3. PRODUCT OVERVIEW AND COMPONENTS

The Virone EM-2 meter features a compact design for easy integration into electrical panels.



Figure 3.1: Front view of the Virone EM-2 Digital AC Energy Meter, showing the LCD display and branding.





Figure 3.2: Angled view of the Virone EM-2 meter, showing connection terminals and specifications label.



Figure 3.3: Rear view of the Virone EM-2 meter with serial number and barcode. The barcode value is 5908254813191 and the serial number is No 000003.



Figure 3.4: The Virone EM-2 Digital AC Energy Meter installed within a standard electrical distribution box, demonstrating its compact fit on a DIN rail.

Key Components:

- **LCD Display:** Shows energy consumption in kWh (5 digits for integer, 2 digits for decimal).
- **Pulse Output LED:** Flashes to indicate active energy consumption.
- **Connection Terminals:** For input (Phase IN, Neutral IN) and output (Phase OUT, Neutral OUT) wiring, and pulse output.
- **DIN Rail Clip:** For secure mounting on a TH-35 mm DIN rail.

4. SETUP AND INSTALLATION

The Virone EM-2 meter is designed for easy installation on a standard TH-35 mm DIN rail. Follow these steps carefully:

1. **Power Disconnection:** Before starting, ensure that the main power supply to the installation area is completely disconnected. Verify with a voltage tester.
2. **Mounting:** Clip the EM-2 meter onto the TH-35 mm DIN rail in your electrical distribution box. Ensure it is securely fastened.
3. **Wiring - Main Circuit:**

- Connect the incoming Phase (L) wire to the 'IN' terminal (typically terminal 1).
- Connect the incoming Neutral (N) wire to the 'IN' terminal (typically terminal 3).
- Connect the outgoing Phase (L) wire to the load to the 'OUT' terminal (typically terminal 2).
- Connect the outgoing Neutral (N) wire to the load to the 'OUT' terminal (typically terminal 4).

Refer to the wiring diagram on the side of the meter for exact terminal numbering.

4. **Wiring - Pulse Output (Optional):** If using the pulse output feature, connect the pulse output terminals (typically 5 and 6) to your external device (e.g., PLC, data logger). The pulse output requires an external power supply of 12-27V and has a current limit of ≤ 27 mA. Each pulse duration is approximately 90 ms.
5. **Verify Connections:** Double-check all wiring for correctness, tightness, and proper insulation.
6. **Restore Power:** Once all connections are verified, restore power to the circuit. The meter's LCD display should illuminate, and the pulse LED may begin to flash if there is a load.





Figure 4.1: Angled view of the Virone EM-2 meter, illustrating the wiring diagram on the side panel for correct connection.

5. OPERATING INSTRUCTIONS

The Virone EM-2 meter operates automatically once correctly installed and powered. There are no user-adjustable settings.

- **Energy Display:** The LCD screen continuously displays the total accumulated energy consumption in kilowatt-hours (kWh). The display format is 5 digits for whole kWh and 2 digits for decimal kWh (e.g., 12345.67 kWh).
- **Pulse Indicator:** The red LED on the front panel will flash at a rate proportional to the instantaneous power consumption. A higher flash rate indicates higher power usage. The pulse frequency is 1000 impulses per kWh (1000 imp/kWh).
- **Pulse Output:** If connected, the pulse output will generate a pulse for every 1000 imp/kWh, allowing external systems to record energy consumption.

6. MAINTENANCE

The Virone EM-2 energy meter is designed for maintenance-free operation. However, to ensure its longevity and accurate performance, consider the following:

- **Cleaning:** Periodically wipe the meter's exterior with a soft, dry cloth. Do not use abrasive cleaners, solvents, or liquids that could enter the device.
- **Inspection:** Occasionally inspect the wiring connections to ensure they remain tight and free from corrosion.
- **No User Serviceable Parts:** The meter contains no user-serviceable parts. Do not attempt to open or

repair the device, as this will void the warranty and could lead to electrical hazards.

7. TROUBLESHOOTING

If you encounter issues with your Virone EM-2 meter, refer to the following common troubleshooting steps:

- **No Display/Meter Not Working:**
 - Check if the main power supply to the circuit is active.
 - Verify all wiring connections (Phase IN, Neutral IN) are correct and secure.
 - Ensure the voltage supply is within the specified range (230V~, 50Hz).
- **Pulse LED Not Flashing:**
 - Confirm that there is an active electrical load connected downstream of the meter. The LED will only flash when energy is being consumed.
 - Check wiring to the load.
- **Incorrect Readings:**
 - Ensure the meter is correctly wired according to the diagram (Phase and Neutral are not swapped).
 - Verify that the meter's specifications match the requirements of your electrical system.

If the problem persists after performing these checks, contact a qualified electrician or the product supplier for assistance. Do not attempt to repair the device yourself.

8. SPECIFICATIONS

Model	EM-2
Type	Single-phase Digital AC Energy Meter
Power Supply Voltage	230 V ~, 50 Hz
Base Current (I_b)	5 A
Maximum Current (I_{max})	40 A
Minimum Current (I_{min})	0.25 A
Pulse Frequency	1000 imp/kWh
Measurement Accuracy Class	1
Display	LCD (5 + 2 digits)
Pulse Output	Yes (12-27 V, ≤ 27 mA, pulse = 90 ms)
Number of Modules	1
Protection Type	IP51
Mounting	DIN TH-35 mm rail

Dimensions (W x H x D)	18 x 110 x 60 mm
Weight	90 g

9. WARRANTY AND SUPPORT

Specific warranty terms and conditions for the Virone EM-2 Digital AC Energy Meter are typically provided by the retailer or manufacturer at the time of purchase. Please refer to your purchase documentation or contact your point of sale for detailed warranty information.

For technical support or inquiries not covered in this manual, please contact Virone customer service or your authorized distributor. Ensure you have your product model (EM-2) and purchase details available when seeking support.