

ET 255.02

Photovoltaic modules for solar electricity systems



Description

- 4 photovoltaic modules on a pivoting frame for ET 255
- measurement of illuminance and module temperature
- illumination by sunlight or light source HL 313.01

The ET 255.02 device is intended as a solar electricity source for the ET 255 solar electricity system and contains four photovoltaic modules on a pivoting frame.

The photovoltaic modules contain serially connected monocrystalline silicon solar cells and deliver a power that is suitable for supplying ET 255. The arrangement of the photovoltaic modules enables illumination during laboratory experiments using the artificial light source HL 313.01, which can be used as an optional accessory.

The illuminance and module temperature are recorded in experiments. The measured values are transferred to the GUNT software in ET 255. In this way, it is possible to investigate how these measured variables affect the operating behaviour of photovoltaic modules and downstream components of the ET 255 solar electricity system. The pivoting mounting of the modules allows inclination angles from 0° to 90°. The influence of the inclination angle on the maximum power point (MPP) can be analysed.

The GUNT software in ET 255 is network-compatible and enables experiments to be monitored, recorded and analysed at any number of workstations via the customer's own network.

Learning objectives/experiments

- use of photovoltaic modules in modern solar electricity systems
- experiments with ET 255 and ET 255.03 with specified generation and consumption profiles
- operating behaviour of photovoltaic modules with varying temperature and illuminance
- influence of the inclination angle on the maximum power point (MPP)
- power optimisation with MPP trackers
- efficiency and dynamic behaviour of the components of ET 255

Specification

- [1] mobile pivoting frame, adjustable angle of inclination
- [2] electrical wiring of solar modules for operation with ET 255
- [3] sensors for module temperature and illuminance
- [4] acquisition and display of measurement data via GUNT software included in ET 255
- [5] network capability: monitor, record and analyse experiments at any number of workstations with GUNT software via the customer's own LAN/WLAN

Technical data

- 4 photovoltaic modules, 54 cells
- cell dimensions: 125x62mm
 - rated power: 100W
 - short-circuit current: approx. 3,5A
 - open-circuit voltage: approx. 34,9V
 - temp. coefficient (power): -0,38 %/K

Illuminance sensor

- measuring condition -35...+80°C
- temperature dependence: 0,4%
- interface: Modbus

Measuring ranges

- cell temperature: -40°C...90°C
- illuminance: 0...1,5kW/m²
- inclination: 0...90°

- 230V, 50Hz, 1 phase
 230V, 60Hz, 1 phase
 120V, 60Hz, 1 phase, UL/CSA optional

Required for operation

ET 255

Scope of delivery

- 1 experimental unit

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Required accessories

ET 255 Operating options for modular solar electricity systems

Optional accessories

ET 255.01 Photovoltaic simulator
ET 255.03 Consumers in solar electricity systems
ET 256 Cooling with solar electricity