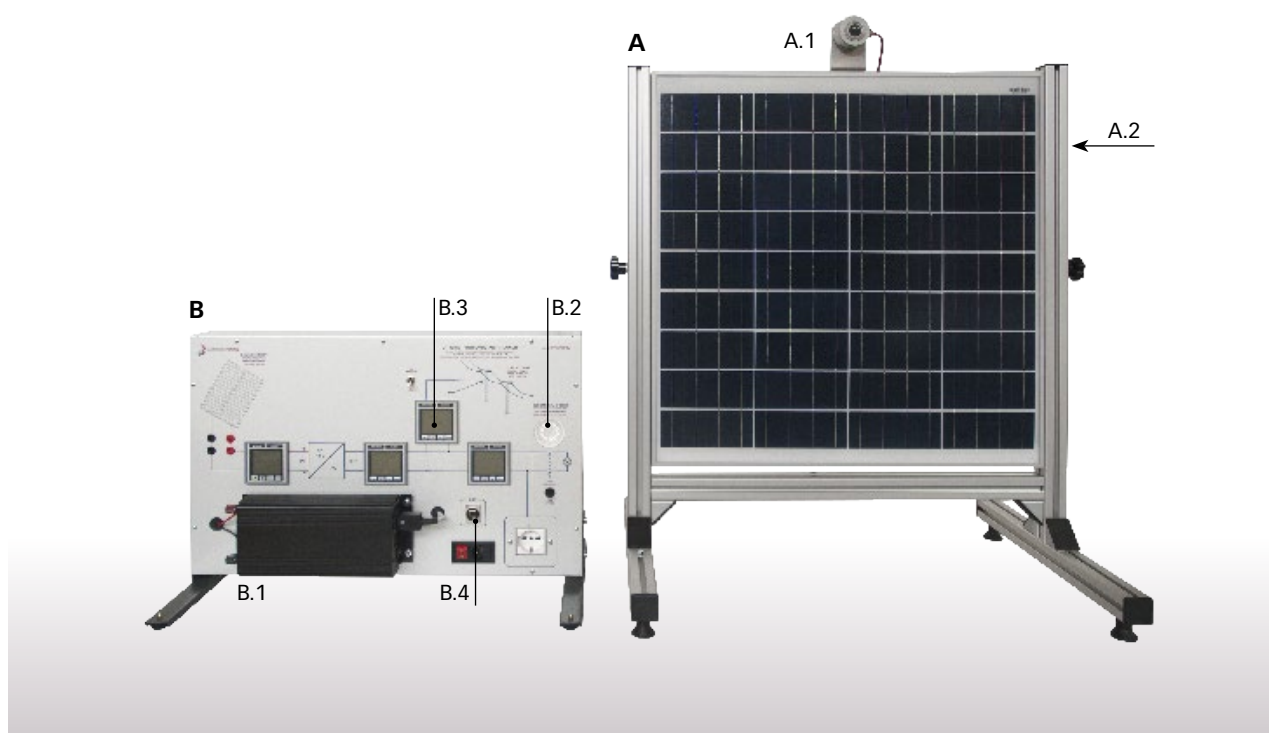


ON-GRID PHOTOVOLTAIC TRAINER

Mod. PV-EGRID/EV

Mod. PV-GRID/EV (computerized vers.)



INTRODUCTION

Energy saving and renewable energy exploitation are issues of fundamental importance at global level. The use of a photovoltaic panel allows to face these issues.

The proposed system, which uses real components available on the market, allows the study and experimentation of the operation of a photovoltaic panel.

DESCRIPTION

System configuration: grid-connected

The system consists of:

A) Table top silicon cell photovoltaic (PV) panel

A.1) Solar radiation sensor (*PV-GRID/EV* only)

A.2) Temperature sensor (*PV-GRID/EV* only)

B) Table top control panel including:

B.1) Grid-Tie Inverter

B.2) Electric load (lamp)

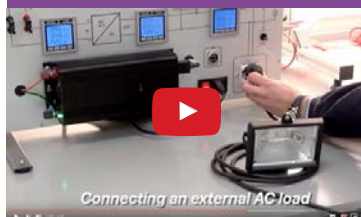
B.3) Electric instrumentation for detecting the energy flows in the different branches of the circuit

B.4) PC data acquisition system (*PV-GRID/EV* only)

Relevant features:

- The PV panel can be used both outdoors and indoors. In case of indoor use, the lighting device *SS-2/EV* is required (**optional item** - refer to the end of this data sheet)
- The PV panel can be disconnected from the system to draw the characteristic curve. The portable rheostat *PRH-1* is required (**optional item** - refer to the end of this data sheet)

A video demonstration is available on Elettronica Veneta YouTube channel

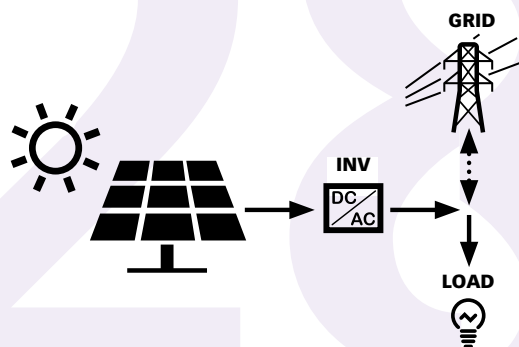


Scan code to watch



Operating principle:

- If the user consumption is lower than the available energy from the photovoltaic panel, the excess power is fed to the grid
- On the contrary, when consumption is higher than the available energy, the additionally required energy is supplied by the grid

**TRAINING PROGRAM**

- Components of a grid connected solar system for electricity production
- Effect of solar radiation on the panel output voltage (*)
- Effects of shading on a real solar installation (*)
- Photovoltaic panel energy conversion efficiency (*)
- Interconnection of solar energy to the public grid
- Operation and efficiency of a DC/AC inverter
- Connection to portable rheostat *PRH-1* (**optional item** – refer to the end of this data sheet) for photovoltaic panel characteristic curve construction

(*) For *PV-EGRID/EV* Solar radiation meter *SORM* (**optional item** – refer to the end of this data sheet) required

TECHNICAL SPECIFICATIONS**Silicon cell photovoltaic panel**

- Adjustable tilt table top aluminum frame
- 60 W photovoltaic panel

Table top control panel

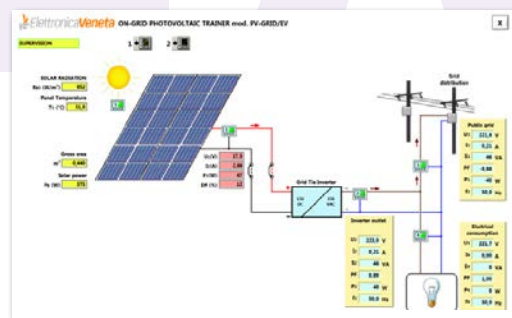
- Metal structure with complete color synoptic diagram
- Grid tie power inverter:
 - Rated AC Output Power: 450 W
 - AC Output Voltage: 230 V
 - AC Output Frequency: 50 Hz
 - DC Input Voltage Range: 11 V ÷ 28 V
 - Output Current Waveform: Pure Sine-wave
 - MPPT Function
 - Protection vs: Over Current, Over Temperature, Reverse Polarity, Anti-Island
- Electric load: 230 V lamp
- Socket for connection to the spotlight *ACL220V* (**optional item** – refer to the end of this data sheet)
- Microprocessor-based instruments for DC/AC parameters

Sensors (PV-GRID/EV only)

- Solar radiation sensor for measuring and transmitting the global solar radiation incident on the PV panel to the control panel. Range: 0 ÷ 2000 W/m²
- Temperature sensor for measuring and transmitting the PV panel temperature to the control panel. Range: -50 ÷ +70 °C

PC data acquisition (PV-GRID/EV only)

- All instruments and sensors, as described above, are connected in Modbus network. This network is connected to a PC via an adapter RS485/USB.
- A specific software (developed with LabView) is supplied to monitor the system parameters
- Parameters displayed:
 - All DC / AC parameters
 - Photovoltaic panel incident solar radiation
 - Photovoltaic panel temperature



- The software enables to:
 - Calculate solar energy conversion efficiency
 - Visualize the solar radiation incident on the panel surface and its temperature and the energy flows to and from photovoltaic panel, public grid and load
 - Save the exercises data for future analysis or project work

Power supply: 230 Vac 50 Hz single-phase - 50 VA
(Other voltage and frequency on request)

Dimensions: Control panel: 65 x 40 x 10 cm
Solar panel: 80 x 50 x 88 cm

Tot weight: 35 kg

REQUIRED

PERSONAL COMPUTER
- NOT INCLUDED -
(PV-GRID/EV only)

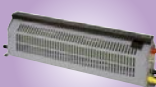
**SUPPLIED WITH**

THEORETICAL-EXPERIMENTAL HANDBOOK

**OPTIONAL (REF. ACCESS. AND INSTRUMENTS)**

INDOOR LIGHTING DEVICE
Mod. SS-2/EV

To operate the photovoltaic panel indoor



PORTABLE RHEOSTAT Mod. PRH-1

To draw the PV panel characteristic curve

SOLAR RADIATION METER
Mod. SORM (PV-EGRID/EV only)

To calculate the solar energy into electric energy conversion efficiency



SPOTLIGHT Mod. ACL220V

To be used as 230 Vac electric load