

PORTABLE SOLAR CENTRAL UNIT FOR ISOLATED SITE WITH ARTIFICIAL LIGHT SOURCE



The SOL-PRO solar unit includes:
 1 technical briefcase.
 2 portable and folding photovoltaic panels.
 1 artificial light source (3 spotlights).
 2 cables to connect the panels to the case.
 1 set of safety leads 4mm.

ref. SOL-PRO ref. SOL-PRO-N briefcase only

Smartphone not supplied



Requires download in Play Store or Apple Store the free application "Victron Energy".
 Display on tablet or Smartphone:
 - Voltage – Current of the panel / Power (W)
 - Voltage – Current of the battery / Charge current
 - On-Off state charge

EDUCATIONAL OBJECTIVES

- Understand a photovoltaic installation of isolated site type.
- Understand the security features of the system.
- Perform wiring of a photovoltaic system.
- Perform electrical measurements of different quantities.
- Analyze & interpret the results.
- Study the performance and impact of solar panels positioning
- Study the energy chain (production, storage, use of a solar charge controller for battery).

TEACHING RESOURCES STUDENT & TEACHER

A synoptic shows the different components and the interconnections.
 Connection in jump wires by safety leads 4mm.
 Connection of the panels to the technical case by 2 photovoltaic leads (delivered).
 Measures are possible indoor by using the artificial solar source.



Electrical characteristics of the solar unit

- 2 photovoltaic panels (panel features):
 - nominal power P_{mpp} : 30 Wc
 - max power voltage V_{mpp} : 18.6V DC
 - max power current I_{mpp} : 1.61 A
 - open circuit voltage V_{oc} : 22.9V DC
 - short-circuit current I_{sc} : 1.76A
- Power injected, with artificial source: 17 Wc (24V/0.7A)
- Output voltage 230 V - 50 Hz pure sinusoidal. 120 VA max.
- Output voltage 24V DC. 180W max

Composition of the technical case

- Case made of impact-resistant polypropylene. It can be closed without disconnecting the safety cords from the front. Light and easy to carry by its handle.
- 2 photovoltaic sockets for connecting solar panels.
- 1 surge arrester.
- 1 Start/Stop switch to isolate the solar panel circuit from the technical case.
- 4 two-pole solar circuit breaker protecting the solar panel circuit, batteries and use.
- 1 24V/20A solar charge controller with display showing:
 - battery charge
 - current supplied by the solar panels
 - battery charge current
 - current consumed by the use circuit
 - battery voltage.
- 1 voltage converter pure sinusoidal 50 Hz - 24/230V AC, 120 VA. Auto-protection by resettable thermal fuse.
- 2 batteries 12V/8AH
- 1 set of 4 mm safety cords.
- 1 output 230V AC - 120 VA on 4 mm safety terminals
- 1 use output 24V DC - 180 VA on 4 mm safety terminals
- Dimensions: 540 x 430 x 215mm

Composition of the photovoltaic panels frame

- Aluminium frame
- 2 poly-crystalline photovoltaic panels, each 30 Wc.
- 2 hinges for folding them together.
- Useful surface area of the cells on each panel 0.2 m²
- 1 system for putting the panels at the tilt angle required.
- 1 device for measuring the tilt angle.
- 2 3-metre photovoltaic cords.
- Light and easy to move (Carrying handle).
- Dimensions in unfolded position: 780 x 400 x 600 mm
- Dimensions in folded position: 360 x 500 x 100 mm

Composition of the artificial light source

- 3 400W spotlights with variable tilt.
- Power supply 230V AC 50/60 Hz by 2-metre mains cord.
- Spotlight dimensions: 300 x 220 x h 360 mm

Supplied with CD containing

- Theoretical summary of the different types of photovoltaic cells and energy.
- The detailed wiring diagram of the solar unit
- 5 theoretical assignments and 3 complete practical assignments as student/instructor book.
- Full instructions for each component