

Solar tracker with battery



ref. TRACSOL

EDUCATIONAL OBJECTIVES

- Study and putting into service of a solar tracker.
- Understanding the operation of solar cells.
- Mastering the wiring of the components of a photovoltaic installation at an isolated site.
- Taking measurements using an oscilloscope and clampammeter.

TEACHING RESOURCES STUDENT & TEACHER

Practical works

- Lessons on the different solar panel technologies (Monocrystalline, Polycrystalline, Amorphous)
- Study on the positioning of solar panels for maximum output.
- Study of solar radiation.
- Reminder on Direct, Diffused and Reflected solar radiation.
- Comparison of the read powers with fixed panels and tracking panels.
- Study and creation of the wiring of a solar energy system at an isolated site.
- Reading the currents and voltage at different points of the wiring.
- Interpreting the measurements then calculate the efficiency.
- Calculation of the discharge time of the battery according to the load.

Comprises

- 2 solar panels 30W-12V Monocrystalline.
- 1 azimuth rotation motor of 160° maximum, that is more than 8 hours of tracking in position perpendicular to the sun.
- 1 zenith rotation motor 43° for full tracking of the sun's elevation.
- 1 set of solar cells.
- 1 cabinet with door.
- 1 Solar load regulator 12V/20A.
- 1 battery 12V-14Ah.
- 1 output 12VDC-60W available on 4mm terminal.
- Protection with gPV cartridge fuse.
- Emergency stop and switch + 'on' indicator light.
- 1 printed side with 4 BNC plugs.
- 1 artificial solar source mounted on telescopic stand.

Features

- 3-metre mains lead for the artificial source.
- Dim.: 800 x 600 x h 1700mm. Weight: 80kg.
- The pole and the panels are easy to remove for going through doorways.

The solar tracker is a technical innovation for tracking the sunlight, in order to increase the efficiency of photovoltaic panels. The productivity gain can reach 40% with a 2-axis tracking installation. TRACSOL is a teaching solution for learning this technique. Equipped with 2 axes and 4 cells for automatic sunlight tracking, it is completely self-contained. No connection to the mains 230V is required. Only the artificial solar source enabling TRACSOL to be used indoors is powered with 230VAC. The transparent sides of the mechanical box enclosing the two axes provide a full view of the chain drive linkages.

4 BNC attached to the front of the cabinet enable the reading on oscilloscope of the signals generated by the 4 solar cells.

The voltage of the solar panels is available on the two safety terminals.

The assembly is mobile thanks to 4 heavy-duty wheels attached under the frame.