

STUDY OF FAULT DIAGNOSTICS ON A SOLAR INSTALLATION

SOL-DIAG is a solar model for producing faults at different points of the wiring. The assembly is comprised of an aluminium frame on casters, a wiring frame with solar components, a set of switches and a separate photovoltaic panel.

The faults can be produced by the instructor by rotating single switches. The voltage of the circuit does not exceed 30VDC. Thus students can take measurements or perform tests in complete safety, regardless of the fault type.

EDUCATIONAL OBJECTIVES

- To learn and understand the operation of a photovoltaic installation.
- To diagnose faults on a photovoltaic installation in isolated site.
- To take the measurements of the different electrical values.
- Analysing and interpreting the results.
- To study the efficiency of the solar panels.
- To study the energy system (production, storage, use, energy performance).

TEACHING RESSOURCES STUDENT & TEACHER

Practical works

- Identification of the different components of the energy system.
- Producing the electrical diagrams.
- Calculation of the efficiency of the photovoltaic panel.
- Reading the currents and voltages in the circuit.
- Finding the faults on the circuit using measuring devices.

Model supplied wired, operational, with teaching manual on CD.
Autonomous power supply. Recharges the batteries using the supplied charger.

Composition of the model

- Frame with casters, two with brakes
- One wiring frame equipped with:
 - 1 surge arrester
 - 6 two-pole fuse holders
 - 1 maintenance switch
 - 2 batteries 12VDC-8Ah
 - 1 20A charge regulator with LCD
 - 1 voltage converter 24VDC/230VAC-200VA
 - 2 bulkhead lights, one with 230VAC, the other with 24VDC
 - 1 battery charger 12VDC
- One unit containing 7 switches for creating faults
 - One key operated flap for hiding the switches
- Melamine shelf 750x400mm
- Dimensions of the frame: H 1800 x 800 x 700mm



Flap for access to the switches

Composition of the solar source

- Solar panel 30W-24VDC on frame with casters (2 with brakes)
- 2 projectors for simulating the sun's rays
- 2 photovoltaic cables 3 metres for linking the panel to the wiring frame
- Dimensions of the panel frame: H 1300 x 900 x 620mm



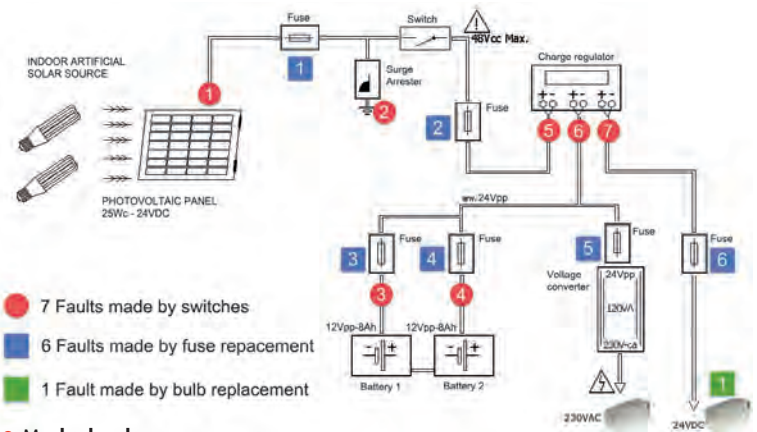
Model + Solar source (panel and spotlights) for indoor operation

ref. SOL-DIAG

aref. SOL-DIAG-N Sold without solar panel

Use your own panels with specifications comprises between 18 & 50VDC.

DESCRIPTION OF THE FAULTS



• Marked red

- Faults 1/2/4: switch for wire break
- Fault 3: Insertion of high resistance in series
- Faults 5/6/7: faults on the 3 inputs of an electronic component inside the charge regulator. The voltages are present on the + and - terminals but the regulator does not work.

• Marked blue

- Faults 1/2/3/4/5/6: change of fuse with defective one.
- 6 OS fuses are supplied with the model.

• Marked green

- Fault 1: change of bulb 24V with a defective one.
- Defective bulb supplied with the model.