EIE-06-256 REEPRO

Intelligent Energy Europe

Promotion of the Efficient Use of Renewable Energies in Developing Countries

Training equipment data sheet

Data sheet No.: 3

Authors

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Type of Equipment: (tick off the type)	PV	Solar Thermal	Biomass to Energy		
	✓				
Name:	**Mini Solar Home System (Mini SHS)**				
Location of the equipment:	Energy Technology Laboratory, Faculty of Engineering, National University of Lao				
Year of purchasing:	2008				
Operator: (Name and address)	NUOL REEPRO project Team. Sokpaluang campus. Friendship road. Vientiane Cap., Lao PDR. P.O. Box 3166				
Planner: (Name and address)	NUOL REEPRO project Team. Sokpaluang campus. Friendship road. Vientiane Cap., Lao PDR. P.O. Box 3166				
Detailed description of the installation: (technology, function, benefit for training, etc. max 150 words)	The Mini SHS set comprises 4x10Wp standard poly-crystalline solar modules, 4x5Wp standard Mono-crystalline solar modules, 1xCharging controller (CX10 Phocos); 1x33Ah sealed battery; 1xDC socket; 1x300W Power inverter; panel frame stand; Modules' connection board; 2xmulti-meters and some connection cables. The set is used for practical exercises on SHS, such (1) solar modules installation; (2) SHS sizing, installation, operation and maintenance.				
Generated Energy service: (tick off the energy type)	electricity	Heat	gas	light	
	✓				
Power output of installation: (kWel, m³ biogas, kW th, etc.)	4x10Wp=40 Wp 4x5Wp=20Wp				
Financing* (tick off the financing type)	private investment	loan	donation	grant	
				✓	
Investment costs in US$*	~920US$				
Maintanance costs in US$*	N/A				
Savings*	N/A				
Energy sale income in US$*	N/A				
Comments					

***Only when the equipment is used permanetly**

Pictures and grafics

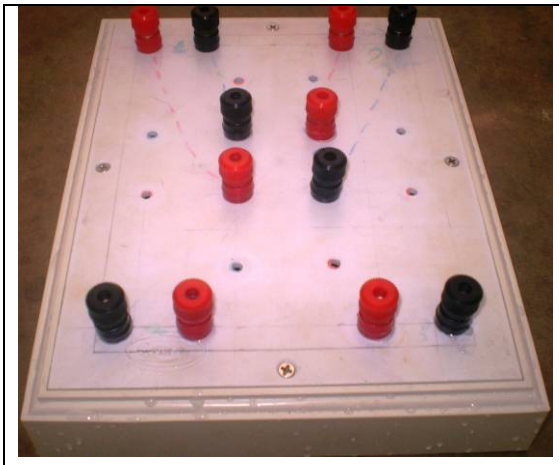
10Wp module

(5Wp module)

Control panel

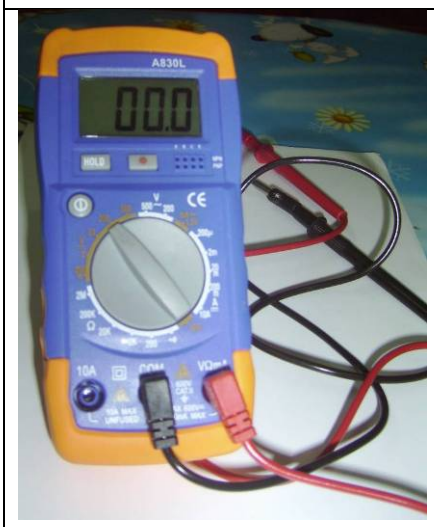
Sealed Gel battery

Modules stand changeable for different slops



Modules connection board

Power Inverter



Multi-meter

Connecting cables

Possible practical exercises with the Mini Solar Home System

Level 1 and 2 - Checking actual Module parameters

1. Objective

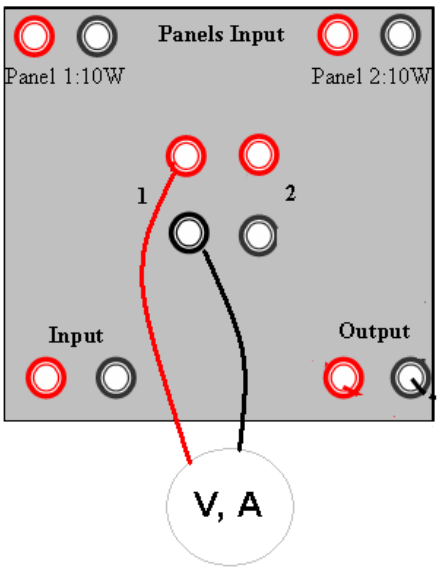
Objective of this exercise is to check the actual output parameters of solar module and then to compare with nominal ones.

2. Purpose

Purpose of this exercise is to provide knowledge and skills on connecting modules to get desired system voltage, current and power.

3. Performance

measurement of open circuit voltage (O.C.) and Short circuit current (S.C) of a given module and compare with its nominal parameters



Checking of actual out parameters of the modules

4. Modules connection

The trainees are firstly to connect two 10Wp modules, then to connect modules of different sizes. For each connection, trainees should make measuring of the following parameter

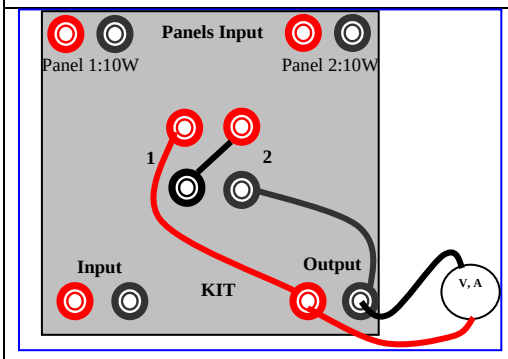
- Open voltage (Uo.v.),
- short circuit current (Is.c)
- Calculate the output wattage(Uo.v x Is.c).

In this exercise, modules are placed at the same slop angle and orientation.

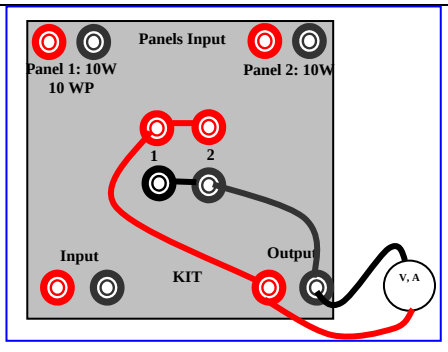
The table shows what output data to be measured.

Connection	Uo.c. (V)	Is.c. (A)	P (W)	Remarks
–Module 1 (single)				
–Module 2 (single)				
Connected In series				
Connected in parallel				

4.1 Connection of modules of the same size

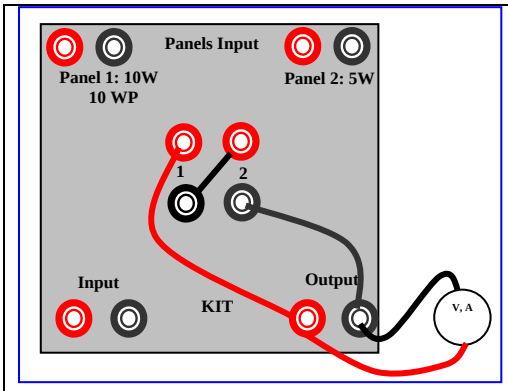
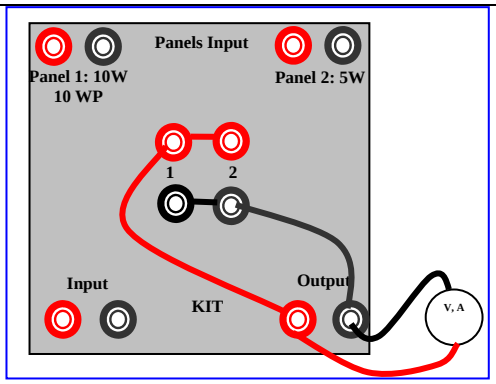


Connected in series



Connection of modules in parallel

4.2 Connecting modules of different size

 Connected in series	 Connection of modules in parallel
Level 3 : Promotion of benefits of SHS, its proper use and maintenance	
1. Purpose of this exercise	To help local energy service providers on information transfer and demo show of SHS To give local people knowledge on PV SHS use, its benefits and its maintenance
2. Performance	- Location: Mahaxay district, Khammuane province. Lao PDR - participants: local ESCOs, Village ESCO representatives and local people - SHS components shown - Quizzes on rural energy use: battery, Diesel, PV and Pico hydro devices - correct answers were awarded with REEPRO project souvenir (T-shirt and caps)
3. Results	- local SHS service providers (so-called ESCO) have leant how to promote and disseminate SHS - local people are aware on SHS benefits and proper use