

Sustainable change through education, engineering and communication



Quality Assurance Framework for Component Based Solar Systems in Uganda

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Training • Consulting • Engineering • Publications



- Uganda is receiving funding support from the World Bank for **Energy for Rural Transformation**
- Project managed by Rural Electrification Agency
- GSES was awarded contract in Feb 2019 to provide Consultancy Services for Development of a Quality Assurance Framework for component-based solar systems under ERT III
- GSES Ugandan partner on project: Konserve Advisory Services



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Brief Overview of Off Grid Demand

- Only 28% electrified (REA website)
- Aiming to achieve a 60% level of access to electricity for Uganda by 2027.
- In 2020 it was reported 27% using off-grid sources which include generators, rechargeable batteries and solar-based technologies.

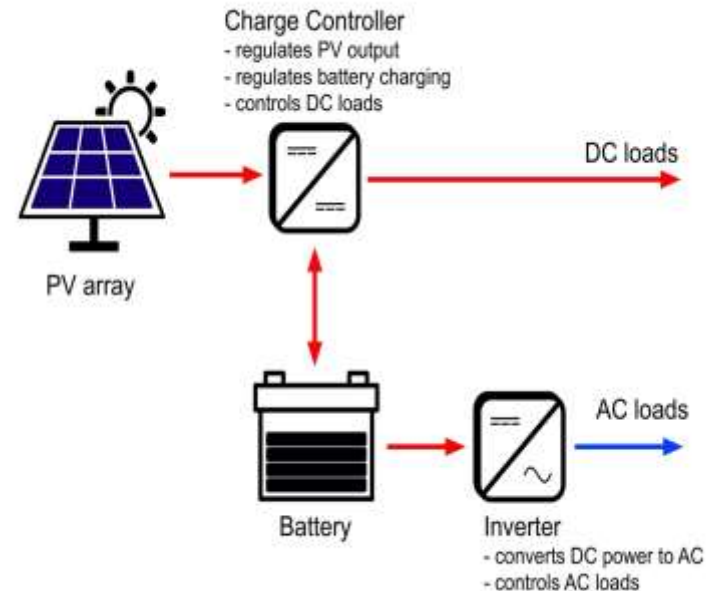


Brief Overview of Uganda Solar Industry



- Uganda Solar Energy Association has over 200 members
- The solar Home system market is dominated by plug and play “lighting global” approved products.(estimated 270,000 sold by 2018) Originally small units under 50W now large systems up to 300W
- Component based above 100W –slowly changing to be above 300W.

- Quality Assurance Framework is to be met by a business operating in Uganda that provides component-based solar home systems.
- The intention of this framework is to promote the deployment of quality-verified off-grid solar systems.



What is in the QAF?

- company requirements;
- products standards for the components;
- installer requirements; and
- complaints and sanctioning procedures.



- The individual system components must comply with the specific product standards listed in the QAF
- The company is required to provide verifiable test certificates to the UNBS from a testing laboratory accredited to ISO/IEC 17025 **General Requirements for the Competence of Testing and Calibration Laboratories.**



Copies of all the relevant ISO/IEC 17025 accreditation certificates and/or other supporting documentation from the test laboratory may be required if there is any doubt by the UNBS and REA regarding the credibility of a specific test laboratory

- Test certificates shall be sent to the Ugandan National Bureau of Standards (UNBS) for verification for all the major components which include:
 - Solar modules;
 - Solar controller;
 - Battery; and
 - Inverter



TÜV NORD

CERTIFICATE

TÜV NORD CERT GmbH
herewith declares that

Ningbo Huashun Solar Energy Technology Co., Ltd.
228#, Jianghu Rd, Zone C, Jiangbei Industrial Park, Hongtang Town
Ningbo City, Zhejiang Province, 315000
P.R. China

is authorized to provide the product mentioned below with the mark as illustrated:

Description of product (details see Annex 2):

PV Modules with 6" Poly-crystalline Silicon Solar Cells

Tested according to: IEC 61215-1:2016;
IEC 61215-1-1:2016;
IEC 61215-2:2016;
IEC 61730-1:2016;
IEC 61730-2:2016.

Registered No.: 44 780 18 406749 - 193
Manufacturer: see Annex 1
Test Report No.: 492011013.001
File No.: SHV07037/17

Valid from: 2018-06-28
Valid until: 2023-06-27



Essen, 2018-06-28

Regina K.
TÜV NORD CERT GmbH
Certification Body
Consumer Products

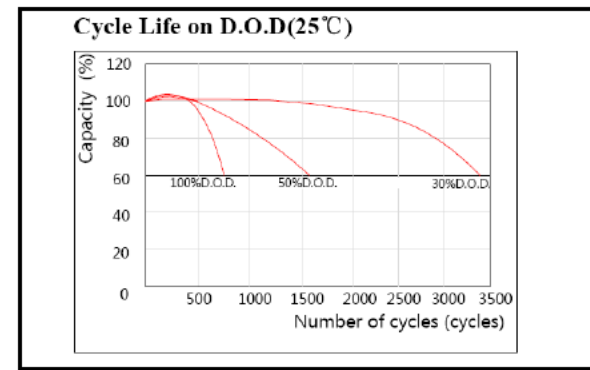
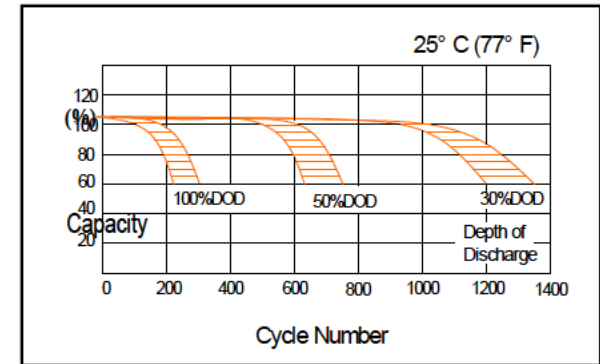
Please also pay attention to the information stated overleaf.

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Product Performance Requirements

- In addition to meeting specific (IEC or UL) product standards some must meet specific product performance requirements e.g. batteries with cycle life of 1100 cycles at 50% DOD



Technical Guidelines



- The QAF references two guidelines that must be followed when designing and installing the solar home systems. These guidelines are titled:
 - Off-Grid PV Systems - Design Guideline; and
 - Off-Grid PV Systems - Installation Guidelines
- The Installation Guideline is currently being developed into a UNBS Code of Practice

- A review of local training in Uganda identified that:
 - Directorate of Industrial Training (DIT) in conjunction with Nakawa Vocational Training Institute (NVTI) had developed the following courses:
 - Short Course in Solar Photovoltaic Technology (Stand-Alone Systems) Level 1 ;
 - Solar Photovoltaic Electrician - Level 1 (Stand-alone Solar Home Systems (off-grid)); and
 - Solar Photovoltaic Electrician - Level 2 (Medium/Large Solar PV Systems (off-grid)).



Installer Requirements



- Successful completion of **The Solar Photovoltaic Electrician - Level 1 (Stand-alone Solar Home Systems (off-grid))** courses is the minimum requirement that an installer must have undertaken or been assessed against.
- All installers after 2 years' experience shall apply and obtain their Z Class Permit provided by the Electricity Regulatory Authority

A photograph of solar panels on a roof at sunset. The sun is low on the horizon, casting a warm glow over the scene. Palm trees and other tropical vegetation are visible in the background. The solar panels are in the foreground, reflecting the light from the sun. The text "Thank you" is overlaid in the center of the image.

Thank you