



FINAL ACCEPTANCE AND COMPLIANCE TESTS SOLAR PV SYSTEMS NAMIBIA S4H GP 600497

Site Name or ID: Kalkrand Health Clinic	Inspection date: 14.12.2017
GSOL Representative: Mr. Oscar Ditlevsen	Note: Grid connected System (public power)

FAC Test Description:

- The main objective of the Final Acceptance Test is to assure the purchaser that all the components of the System are installed in right quantity, and the System met the relevant requirements.
- The Final Acceptance Test is successfully performed when the FAC requirements for a system included in the relevant purchase order are met, the FAC are performed successfully and no severity level 1 (service affecting) or no severity level 2 (non-service affecting) defects remain in the system.
- The punch list shall list all defects ranked as severity level 1 or 2 defects identified during the respective final acceptance test, if any. All level 1 defects shall be remedied by contractor prior to final acceptance. All level 2 defects can be remedied by contractor during 4 weeks after signing FAC.

Severity Level 1 Defects:

Severity Level 1 defects or service affecting defects are all defects that can contribute to FAC failure.

Severity Level 2 Defects:

Severity Level 2 defects or non-service affecting defects are all defects that cannot contribute to FAC failure and should be marked on the document for clearance after the FAC visit. After FAC all severity level 2 defects should be cleared during 4 weeks. The same punch/snag list should be used to verify that all snags identified at FAC are cleared.

Severity Level 1 Defects List:

- Power System not operational (system not supplying power to equipment)
- Power System functioning but not functioning in battery mode.
- Solar chargers not functioning (not supplying DC to the battery or some modules not operational)
- Inverters not functioning (not supplying AC load or some modules not operational)
- Mains mode not functional (not supplying AC load when mains is available, PV panels disconnected and battery discharged)
- Batteries not functional.
- PV panels not functional.
- Delivery not complete.

Severity Level 2 Defects List:

- All other snags identified on site as per the table on page 3.



BILL OF QUANTITY / COMPONENT	PART NUMBER	QUANTITY	CHECKED (GSOL)	APPROVED (CUSTOMER)
Victron Quattro 48/8k/110-100/100	QUA488020000	1	X	✓
Victron SmartSolar MPPT 250//100-TR	SCC125110210	1	X	✓
Victron Lynx Distributor	LYN060102000	1	X	✓
Victron Lynx Power In	LYN020102000	1	X	✓
Victron Lynx Shunt VE.Can	LYN040102100	1	X	✓
Victron Color Control GX	BPP000300100R	1	X	✓
BAE Cell 6 PVV 900 PPOL horizontal batteries	2089017	24	X	✓
EGing Solar 250Watt Poly, Alu panel	02250P05	24	X	✓
Circuit breaker B 16A 1 pole	2622758039	2	X	✓
Circuit breaker C 32A 1 pole	2122721414	2	X	✓
Outdoor cabinet for batteries and inverter w/cooling	SBC-DK	1	X	✓



SEVERITY LEVEL 1 SNAGS – SERVICE AFFECTING SNAGS:	PASS	FAIL	CLEARED
Power System operational? Supplying power to equipment	X		✓
Power System tested in hybrid mode, stable in all modes: generator/mains, solar and battery (not related to generator issues)	X		✓
All Solar chargers functional? Charging batteries when solar energy available.	X		✓
All Inverters functional? Supplying load to AC equipment.	X		✓
All Solar panels functional?	X		✓
Battery operation to be verified?	X		✓
Delivery complete?	X		✓
SEVERITY LEVEL 2 SNAGS –NON - SERVICE AFFECTING SNAGS:	PASS	FAIL	CLEARED
Installation is as per agreed layout design.	X		✓
The visual inspection of equipment is free from any damage.	X		✓
All connections (cabling and coopers) correct gauge and securely terminated.	X		✓
Solar structure properly mounted on the roof or ground.	X		✓
All solar panels firmly fixed on roof or ground structure.	X		✓
All equipment labeled.	X		✓
No alarms present on power system.	X		✓
System log files to be verified.	X		✓
System Voltage Calibration and readings to be checked & verified.	X		✓
Load & Battery Current Calibration to be checked & verified	X		✓
Battery Breaker to be tested & verified.	X		✓
Load Breakers to be tested & verified.	X		✓
Battery rack properly installed	X		✓
Batteries free from damages and acid leakages properly installed on rack.	X		✓
Check earth connections to Power system and Solar panels	X		✓
Staff training performed.	X		✓



DESCRIPTION	VALUE	COMMENTS
Min. AC Load during FAC visit:	0,2 kW	
Max. AC Load during FAC visit:	1,2 kW	Clinic A/C unit and cabinet cooling active
Current from Solar chargers:	62 A	Can go from 0 to 100A
Battery voltage:	55V	
Generator Rating:	N/A	No genset present
Equipment Room Temperature at FAC visit:	30 °C	Cabinet set to 26 °C
Battery voltage to switch on Mains:	49 V	
AC Current available from mains:	32 A	Limited by programming and breaker

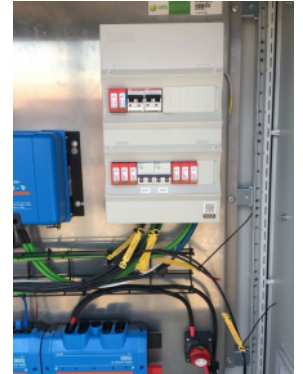
SNAGS LIST – TO BE CLEARED	RESPONSIBLE	CLEARED
Installation Complete – no pending installation related action.		

FAC Approval/Signatures:

FAC APPROVED BY:	Name:	Signature:
Site Representative	Willa Noruis (Nurse)	<i>[Handwritten Signature]</i>
GSOL Representative	Oscar Ditlevsen	<i>[Handwritten Signature]</i>
UNDP		
UNDP/PSU Representative	Blessing Kabasa	<i>[Handwritten Signature]</i>



Annexes







System Test Report

1. General Data		 GSOL ENERGY GLOBAL A/S 2017MP100065 www.gsolenenergy.com		
Project Nr.:	10187			
Customer:	UNDP (GP600497 Namibia)			
System ID:	2017MP100065			
Q.C. Passed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Signature: <i>Chino</i>		
2. System information				
<input checked="" type="checkbox"/> Inverter	No. of Inverters:	1	Inverter type & size:	V. Quattro 8kVA
	Voltage (L-N):	230 VAC	<input checked="" type="checkbox"/> 1-phase or <input type="checkbox"/> 3-phase	
	DC Cable dimension:	25 mm2	DC fuse:	200 A
	AC-Out Cable dim.:	2x6 mm2	AC relay/junction Amp:	
	AC-In Cable dim.:	2x6 mm2		
	Max DC Amp:	210	Max AC Amp /phase:	34
	Firmware version:	2653-413	<input checked="" type="checkbox"/> AC OVP - out	
<input checked="" type="checkbox"/> Charger	No. of chargers:	1	Charger type:	MPPT 250/100-TR
	DC Cable dimension:	25 mm2	DC fuse:	125A <input checked="" type="checkbox"/> DC OVP DENHguard
	Firmware version:	2.04		
<input checked="" type="checkbox"/> DC Coupling	<input checked="" type="checkbox"/> Distributor	<input checked="" type="checkbox"/> Power-In	<input checked="" type="checkbox"/> Lynx Ve.Can	Max DC Amp:
<input checked="" type="checkbox"/> AC Coupling	<input checked="" type="checkbox"/> Type GEG	AC Amp size:	32A	
	<input type="checkbox"/> Type Multicluster		Clusters:	1
<input checked="" type="checkbox"/> Battery	Battery bank voltage:	48 V	Ah per cluster:	729 C10
<input type="checkbox"/> PV Inverter	No. of PV-Inverters:		Inverter type & size:	
	AC Cable dimension:			
	Grid Feedback allowed	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
	Firmware version:			
<input checked="" type="checkbox"/> Grounding	<input checked="" type="checkbox"/> New Grounding rod	<input type="checkbox"/> Existing Grounding rod	Cable dim.	6 mm2
<input checked="" type="checkbox"/> Monitoring	<input type="checkbox"/> Battery monitor	<input checked="" type="checkbox"/> Color Monitor	<input type="checkbox"/> Other	2.11 Monitor ID: f45eab697ece
3. System testing - Installation				
Fixation	<input checked="" type="checkbox"/> All elements firmly installed	<input checked="" type="checkbox"/> Bolts used at:	INVERTER	
Cabling	<input checked="" type="checkbox"/> Cables laid with respect to bending radius (max 5 x diameter) and orientation			
	<input checked="" type="checkbox"/> Cable fixators at every 30 cm max			
Marking	Cable polarity marked:	<input checked="" type="checkbox"/> Red/Black	<input type="checkbox"/> Cable marking system	
	<input checked="" type="checkbox"/> AC-in / AC-out marked	LABEL		
	<input checked="" type="checkbox"/> Battery connection marked	RED/BLACK		
4. System testing - Function				
Inverter	<input checked="" type="checkbox"/> All lights showing Normal operation	AC test level:	2000 W	
	<input checked="" type="checkbox"/> Listed system voltage and phase verified			
Inverter Program	<input checked="" type="checkbox"/> UPS / Prioritise Grid	Voltage (L-N):	230 VAC	
	<input type="checkbox"/> Custom trigger for cyclic operation			
	AC-In Power trigger lvl:	W	Battery trigger lvl:	Udc
	AC-In Power block lvl:	W	Battery block lvl:	Udc
	<input checked="" type="checkbox"/> Trigger parameters verified			
	<input type="checkbox"/> PV inverter Frequency shifting			
	Grid Feedback activated?	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes from Chargers <input type="checkbox"/> Yes from PV inverters		
	NOTES:	System tested with 500Wp per charger		
System charging	<input checked="" type="checkbox"/> By Chargers	<input checked="" type="checkbox"/> By Grid/Genset	<input type="checkbox"/> By PV inverter	
Safety	Battery Breaker functional	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
System Grounding	<input checked="" type="checkbox"/> Grounding ok			
Monitor	Color Monitor:	<input checked="" type="checkbox"/> All devises showing	<input type="checkbox"/> Activated on Web-portal	
		<input checked="" type="checkbox"/> Two-way com enabled		
	Battery Monitor:	<input checked="" type="checkbox"/> Battery Ah set		
5. Comments / Written notes				