FINAL ACCEPTANCE AND COMPLIANCE TESTS

SOLAR PV SYSTEMS NAMIBIA S4H GP 600497

Site Name or ID: Uutsathima Health Clinic	**Inspection date:** 14.12.2017
GSOL Representative: Mr. Michael Moses	**Note:** **Off-Grid System**

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**	✓	✓
Victron SmartSolar MPPT 250//100-TR	SCC125110210	**1**	✓	✓
Victron Lynx Distributor	LYN060102000	**1**	✓	✓
Victron Lynx Power In	LYN020102000	**1**	✓	✓
Victron Lynx Shunt VE.Can	LYN040102100	**1**	✓	✓
Victron Color Control GX	BPP000300100R	**1**	✓	✓
BAE Cell 6 PVV 900 PPOL horizontal	2089017	**24**	✓	✓
EGing Solar 250Watt Poly, Alu panel	02250P05	**24**	✓	✓
Circuit breaker B 16A 1 pole	2622758039	**2**	✓	✓
Circuit breaker C 32A 1 pole	2122721414	**2**	✓	✓
Outdoor cabinet for batteries and inverter w/cooling	SBC-DK	**1**	✓	✓

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:	0,31kW	
Max. AC Load during FAC visit:	0,31kW	Clinic lights
Current from Solar chargers:	60A	Can go from 0 to 100A
Battery voltage:	56,9V	
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:	49V	No mains active
AC Current available from mains:	32A	Limited by programming and breaker

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

FAC Summary:

FAC APPROVED BY:	Name:	Signature:
Site Representative	ADAM KATHIWASI	
GSOL Representative	MICHAEL MOSES	
UNDP Representative		
UNDP/PSU Representative	Blessing Kabasa	

Annexes


OUTSATHIMA CLINIC

System Test Report

1. General Data

Project Nr.:	10262
Customer:	UNDP (GP600497 Namibia)
System ID:	2017MP100063
Q.C. Passed	☒ Yes ☐ No
Signature	

GSOL ENERGY GLOBAL A/S
2017MP100063
www.gsolenergy.com

2. System information

☒ Inverter	No. of Inverters:	1	Inverter type & size:	V. Quattro 8kVA	
	Voltage (L-N):	230 VAC	☒ 1-phase	or	☐ 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		☒ AC OVP - out	
☒ Charger	No. of chargers:	1	Charger type:	MPPT 250/100-TR	
	DC Cable dimension:	25 mm2	DC fuse: 125A	☒ DC OVP	DENHguard
	Firmware version:	2.04			
☒ DC Coupling	☒ Distributor	☒ Power-In	☒ Lynx Ve.Can	Max DC Amp:	
☒ AC Coupling	☒ Type GEG	AC Amp size:	32A		
	☐ Type Multicluster		Clusters: 1		
☒ Battery	Battery bank voltage:	48 V	Ah per cluster:	729 C10	
☐ PV Inverter	No. of PV-Inverters:		Inverter type & size:		
	AC Cable dimension:				
	Grid Feedback allowed	☐ Yes	☒ No		
	Firmware version:				
☒ Grounding	☒ New Grounding rod	☐ Existing Grounding rod		Cable dim. 6 mm2	
☒ Monitoring	☐ Battery monitor	☒ Color Monitor	☐ Other 2.11	Monitor ID: 04a316e20f68	

3. System testing - Installation

Fixation	☒ All elements firmly installed	☒ Bolts used at:	INVERTER
Cabling	☒ Cables laid with respect to bending radius (max 5 x diameter) and orientation		
	☒ Cable fixators at every 30 cm max		
Marking	Cable polarity marked:	☒ Red/Black	☐ Cable marking system
	☒ AC-in / AC-out marked	LABEL	
	☒ Battery connection marked	RED / BLACK	

4. System testing - Function

Inverter	☒ All lights showing Normal operation		AC test level:	2000 W
	☒ Listed system voltage and phase verified			
Inverter Program	☒ UPS / Prioritise Grid		Voltage (L-N):	230 VAC
	☐ 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
	☒ Trigger parameters verified			
	☐ PV inverter Frequency shifting			
	Grid Feedback activated?	☒ No	☐ Yes from Chargers	☐ Yes from PV inverters
	NOTES:	System tested with 500Wp per charger		
System charging	☒ By Chargers	☒ By Grid/Genset	☐ By PV inverter	
Safety	Battery Breaker functional	☒ Yes	☐ No	
System Grounding	☒ Grounding ok			
Monitor	Color Monitor:	☒ All devises showing	☐ Activated on Web-portal	
		☒ Two-way com enabled		
	Battery Monitor:	☒ Battery Ah set		

5. Comments / Written notes