



GRID SUPPORT CONDITIONER

OVERVIEW

The "Grid Support Conditioner" is designed to operate as a multi-function power conditioning system combines the functionality of a grid-interactive solar inverter with a true on-line single conversion UPS.

The GSC system allows the option of combining renewable energy sources on priority with the functionality of an industrial UPS system. Based on the Solar Power available, the connected load and battery state of charge the unit configures itself as either a charger or inverter and will intelligently start an optional Diesel Genset if the battery reserve could not be maintained by the renewable energy contribution and there is loss of grid power.

In charging mode, the system maintains the battery voltage at a user specified value and charges the battery in accordance with the manufacturer's specification thus maximizing the life of the battery bank.

This GSC series of Inverters output voltage when operating in a Grid Interactive mode and has the ability to export the excess renewable power to the Utility Grid.

BASIC SYSTEM OPERATION:

Under light load conditions with the battery in a “Full State of Charge” the available solar power will supply the load via the inverter with excess solar (renewable) power being exported to the grid.

Under medium and heavy load conditions, all available solar power is used to charge the battery. Any excess solar power is used to handle the site load via inverter. The balance of power needed by the site load is drawn from the grid.

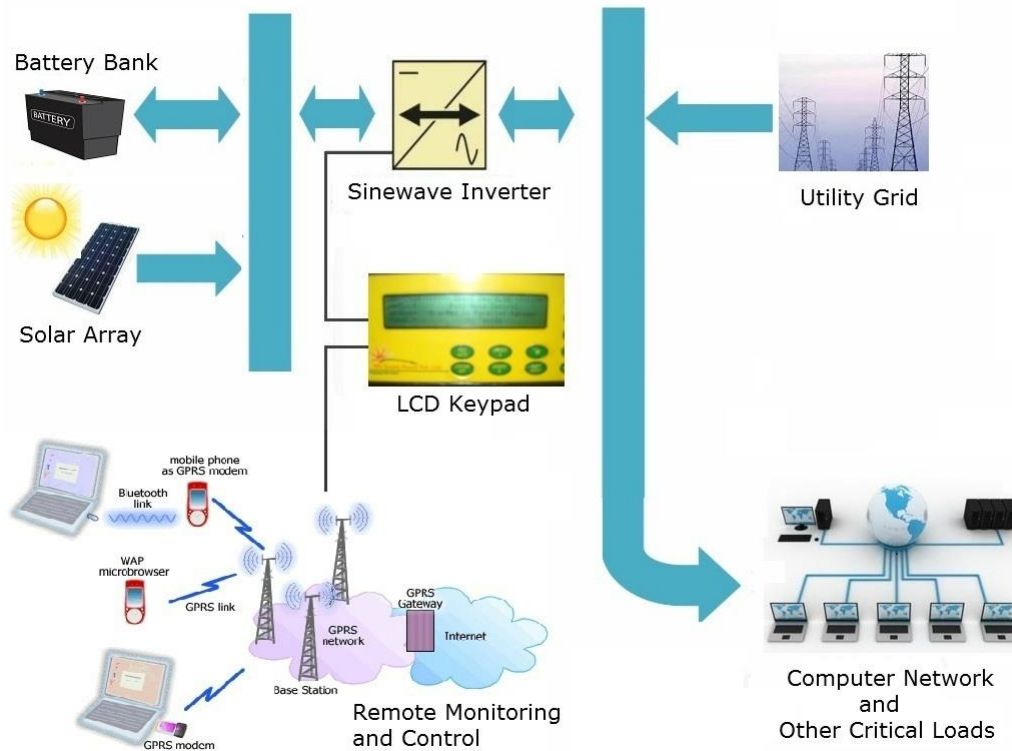
In the event of low solar power being available, the system configures itself as a Grid Charger and the grid commences the charging of the batteries in addition to supporting the load.

Once the battery reached the predetermined level of charge, all available renewable energy will be utilized to power the site load and reduce the power drawn from the Grid. In the event of failure or extreme fluctuations in the grid, the power conditioner automatically disconnects the load and transfers the load to battery power with the available renewable energy.

In the event of battery state dropped below the preset level, an optional Diesel Genset will be started automatically by the inverter and brought on line to supply the load and charge the battery. Once the Grid supply resumes back in the range of predetermined level and stable, the Diesel Genset will be turned off by the inverter and the inverter will go parallel with the Grid to support the site load as well as to charge the battery.

SALIENT FEATURES:

- High Efficiency Bi-Directional inverter systems for optimized power conversion at all times.
- Full Automatic Operation with no break in supply during the transitions from one mode to another mode.
- LCD Display and keypad for system control, monitoring, instantaneous data, event logs, data logs and changing set points.
- Export of excess renewable energy to utility grid
- Automatic starting, transfer and no-break transfer to an optional Generator for extended grid failure.
- Integrated MPPT Solar Charge Controller
- Can be custom build to meet customer requirements.
- Built for harsh working environment.



TECHNICAL SPECIFICATIONS - SINGLE PHASE UNITS

Model	5kVA	6kVA	7.5kVA	10kVA	15kVA	20kVA
Nominal Output Voltage	230Vac, Single Phase, 2 Wire Output					
Inbuilt MPPT Solar Charge Controller	5KWp	6KWp	7.5KWp	10KWp	15 KWp	20 KWp
System Voltage (DC) Nominal	96 V	96/120 V	96/120 V	120 V	120/240 V	120/240 V
Continous Rating	5 kVA	6 kVA	7.5 kVA	10 kVA	15 kVA	20 kVA
Height x Width x Depth (mm)	1000 x 450 x 800	1000 x 550 x 800	1000 x 550 x 1000		1800 x 1000 x 500	
Weight in Kgs	230	300	410	480	600	750

TECHNICAL SPECIFICATIONS – THREE PHASE UNITS

Model	10kVA	15kVA	20kVA	25kVA	30kVA	45kVA	50kVA	60kVA	90kVA
Nominal Output Voltage	415Vac, Three Phase, 4 Wire Output								
Inbuilt MPPT Solar Charge Controller	10 kWp	15 KWp	20 KWp	25 KWp	30 Kwp	45 KWp	50kWp	60 kWP	90 kWP
System Voltage (DC) Nominal	120/240 V DC				240 V DC				
Continous Rating	10kVA	15 kVA	20 kVA	25 kVA	30 kVA	45 kVA	50 kVA	60 kVA	90 kVA
Height x Width x Depth (mm)	1000 x 450 x 800	1000 x 550 x 800	1000 x 550 x 1000		1800 x 1000 x 500	1800 x 1200 x 800			
Weight in Kgs	480	650	700	780	850	950	1000	1200	1350

Parameters	Information
Output Voltage	Stand Alone Mode: Inverter output set at nominal voltage Parallel Mode: inverter to follow generator voltage to $\pm 10\%$ of the nominal output voltage before switching to stand alone mode.
Output Frequency	Stand Alone Mode: Inverter output set at nominal frequency Parallel Mode: AC Synchronized operation. Synchronization window can be operator adjusted via set points. Maximum Range: $\pm 3\text{Hz}$
Surge Rating	150% of rated output for 30 seconds
Nominal Output Frequency	50Hz
Efficiency	> 92% (Max 94%) at full load
GRID	
Nominal Capacity	Same as nominal inverter rating
Grid Acceptable Range	AC voltage $\pm 17\%$, Frequency ± 3
Waveform	Pure Sine Wave
Total Harmonic Distortion	< 3%
Crest Factor	3:1
Change Over	Grid Failure Changeover Time: "No-break" Bump less transfer Support: Site load supplied from renewable and battery until DG Set is running

Front Panel Interface	<ul style="list-style-type: none"> • 40 x 4 LCD panel with keypad for display • Output Voltage / Current / Frequency / Power • Input Voltage / Current • Accumulated Output kWhrs Temperature (either from ambient or panel sensor)
RFI	Designed to minimize both conducted and radiated RFI emissions
Cooling	Fan forced
Earthing Provisions	AC Bypassing to earth on inverter and DC Inputs
Control Type	Voltage source, microprocessor assisted output regulation
Power Control	Phase Controlled Pulse Width Modulation (PWM)
Power Switching	High Efficiency IGBT
Metering	
LCD Keypad Display	<ul style="list-style-type: none"> • Instantaneous Grid or Diesel and Inverter per phase kW, voltage, PF and Frequency • Grid or Diesel on-line status • Battery Voltage, Current, Temperature • Solar Charge Current • Solar Radiation • Wind Charge Current • Wind Speed • Inverter kWh Summation (Input / Output) • Grid kWh Summation (Import/Export) • Solar kWh Summation • Battery (import/export) Summation • Delivered Energy (to load) kWh
Data Logging	
GSC Link Software Capabilities	<ul style="list-style-type: none"> • Instantaneous feedback of power, voltage, power factor and frequency of the grid, diesel and the inverter system • Instantaneous site power • Periodic logging of power, voltage, power factor and frequency of the grid diesel and the inverter system • Periodic logging of battery statistics including battery voltage, current, temperature and renewable current contribution • Adjustable logging period from 60 second averages to 24 hour daily logs • Time and date stamped log entries • Time and date annotated fault log, holding the fault description, operating statistics and fault source • Bulk log download for immediate data importation into a spreadsheet
Download Log Capabilities	<ul style="list-style-type: none"> • Date and time stamped with selectable log periods from 1 minute to 24 hours: • Solar Charge Voltage / Current • Wind Charge Current • Battery Voltage / Current / Temperature • Grid or Diesel kW, Voltage, pf, Frequency • Inverter kW, Voltage, pf, Frequency • Download System Faults • System Overload • Grid Fault / Inverter Fault • Download System Summations • Inverter Input / Output kWh • Grid kWh Summation (Import / Export) • Solar kWh Summation • Battery (Import / Export) Summation • Delivered Energy (to load) kWh
Computer Port Isolation	Standard non-isolated RS 232

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