# ALPHA HBD SERIES

## SINGLE / THREE PHASE

## Technical Datasheet

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **SOLAR INVERTER** | | | | | | | | |
| Inverter Rating | 1-5 kVA | 4-8 kVA | 8-10 kVA | 10-25 kVA | 10-25 kVA | 25-50kVA | 50-100 kVA | 100-250 kVA |
| Nominal Battery Voltage | 48 V | 96 V | 120 V | 120 V | 240 V | 240 V | 240/360 V | 240/360 V |
| No of Phases/Connection Type | 1 Ph | 1 Ph | 1 Ph | 1/3 Ph | 1/3 Ph | 3 Ph | 3 Ph | 3 Ph |
| Nominal Output Voltage/ Frequency | 230/415 V 50 Hz ± 2% (+ 10% -20% in grid synchronised mode) | | | | | | | |
| Voltage Regulation (in Standalone Mode) | ± 2% | | | | | | | |
| Freq. Regulation (in Standalone Mode) | ± 0.5 Hz | | | | | | | |
| THD | < than 5% | | | | | | | |
| Load Power Factor | 0.8 lag to unity | | | | | | | |
| Efficiency: Peak \| 100% Load \| 20% Load | >90% \| >89% \| >80% | | | >92% \| >90% \| >85% | | | >93% \| >92% \| >89% | |
| Over Loads: 60 sec/ 30 sec/ 5 sec | 110% \| 125% \| 150% | | | | | | | |
| Max Allowed Phase Imbalance(for 3Ph) | NA | | | up to 100% | | | | |
| Auto Bypass Feature | Provided | | | | | | | |
| Parallel Operation with Grid/ DG | Provided | | | | | | | |
| Power Export to Grid Facility | Provided | | | | | | | |
| Grid Synchronisation | Provided | | | | | | | |
| **SOLAR CHARGE CONTROLLER** | | | | | | | | |
| Charge Controller Type | MPPT | | | | | | | |
| Charger Topology | Buck Type | | | | | | | |
| PV Nominal Capacity (Total) | as per inverter rating | | | | | | | |
| No of MPPT Channels | 1 | | | | | | 3 | |
| Max. Open Circuit PV Volts (Voc) | 185 V | 320 V | | 620 V | | | 620/750 V | 620/750 V |
| MPPT Upper Range | 137 V | 266 V | 266 V | 515 V | 515 V | 515 V | 515/623 V | 515/623 V |
| MPPT Lower Range | 66 V | 132 V | 165 V | 330 V | 330 V | 330 V | 330/495 V | 330/495 V |
| Battery type Supported | VRLA \| LMLA \| Ni-Cd \| Li-Ion Chemistries \| Flow Batteries | | | | | | | |
| Peak Charging Efficiency | >94% | | | | | | | |
| **GRID CHARGER** | | | | | | | | |
| Grid Voltage Range (Voltage Sync. Range) | +10 % & -20 % VAC | | | | | | | |
| Grid Frequency range (Freq. Sync Range) | +5% & -5% Hz | | | | | | | |
| Max Grid Import Power | as per inverter rating | | | | | | | |
| Peak Charging Efficiency | up to 85 % | | | | | | | |
| **PROTECTION** | | | | | | | | |
| PV Side | Reverse Polarity | | | | | | | |
| | Surge Protection (Class D) | | | | | | | |
| Battery Side | Reverse Polarity | | | | | | | |
| | Over/ Under Voltage | | | | | | | |
| | Current Limit | | | | | | | |
| | Temperature compensation for VRLA charging | | | | | | | |
| Grid Side | Over/ Under Voltage, | | | | | | | |
| | Over/ Under Frequency | | | | | | | |
| | Surge Protection (Class D) | | | | | | | |
| Load Side | Overloads | | | | | | | |
| | Short circuit | | | | | | | |
| System Protection | Over Temperature trip | | | | | | | |
| | Breakers at all Inputs | | | | | | | |
| | Emergency stop | | | | | | | |
| **USER INTERFACE** | | | | | | | | |
| Display Interface | Graphical LCD with backlight (128×64) | | | | | | | |
| Setting Input | Membrane Keypad for Settings Input | | | | | | | |
| Battery Parameters | Voltage, Current | | | | | | | |
| PV Parameters | Voltage, Current, Power, Energy, MPPT Charger O/P Amps | | | | | | | |
| Grid Parameters | Phase Voltage, Phase Current, Frequency, Power | | | | | | | |
| Load Parameters | Phase Voltage, Phase Current, Frequency, Power Factor | | | | | | | |
| System level Parameters | Mode of Operation, Active Faults, Heat Sink/ IGBT temperature, System Mimic | | | | | | | |
| Auxilary Indications | Mains On, Alarm, Buzzer Mute | | | | | | | |
| **MONITORING** | | | | | | | | |
| Wireless Monitoring | Easy to connect GPRS based Xenius Module for remote monitoring of all parameters (5 year data charge + sim included) as well as remote controlling | | | | | | | |
| Communication interface | RS-485 based monitoring showing all parameters through MODBUS | | | | | | | |
| **APPROVALS** | | | | | | | | |
| Anti Islanding from Grid | IEC 62116 | | | | | | | |
| Utility interface | IEC 61727 | | | | | | | |
| Efficiency Test | IEC 61683 | | | | | | | |
| Environmental Test | IEC 60068 | | | | | | | |
| **MISCELLANEOUS** | | | | | | | | |
| Degree Of Protection | IP-21 as per IEC 61529 | | | | | | | |
| Cooling Method | Temp Controlled Force Cooling | | | | | | | |
| Operating Temperature | 0-55 degrees (without Derating) | | | | | | | |
| Humidity | Max. 95% Non-Condensing | | | | | | | |
| Altitude | 1000m above sea level | | | | | | | |
| Cable Entry | Sheet Metal, Floor Standing, Front/ Rear Door | | | | | | | |

**Note:** Over load 200% and grid extra wide range available on request.

## AVAILABLE PRODUCTS VARIANTS FOR SOLAR APPLICATIONS

- Single Phase Off-Grid Solar Inverter
- 3 Phase Central Grid Tie Inverters
- 1/3 Phase Hybrid Solar Inverter
- 3 Phase String Inverters
- Telecom DC Hybrid System
- Intelligent String Monitoring Units
- Array Junction/Combiner Boxes
- Energy Storage Systems

**Alpha TND Limited**
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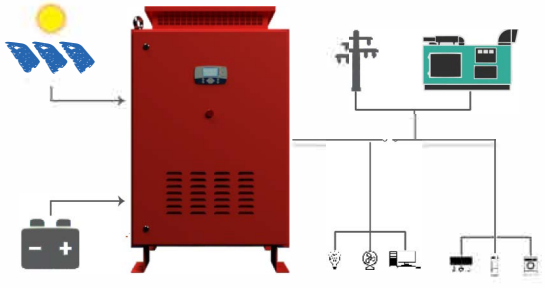
# HYBRID SOLAR INVERTER

## ALPHA HBD SERIES SINGLE / THREE PHASE

Alpha's HBD range of Solar Hybrid Inverters is the No.1 Trusted Hybrid solar technology in the African market. Active front end technology enables it to store the renewable solar energy in the battery as well as export any excess solar power generated, to the grid through net meter, resulting in improved savings at consumer end. Technological partnership between world leading Australian Software and experience in industrial grade designing has resulted in HBD range, setting a benchmark for the solar inverter market. High level of flexibility in the form of configurable set points gives the HBD series an unparalleled level of control over the inverters' parameters. Customisability of settings makes it the ideal product for solar applications like process industries or Telecom BTS where each site has a different grid condition.

Easy to connect Xenius remote monitoring box, comes with 5 year internet charge and sim included. Remotely control your HBD inverter and view system parameters with interactive graphical options.



### Scheduling Features

Controlled scheduling via keypad or PLC

Battery charging according to TOD

Programmable night saving mode

### Active Front End Technology

Low distortion O/P at unity power factor

Increased battery life by avoiding PSOC condition

Export excess PV power to grid through grid synchronisation

### BESS Solution

Peak load shaving/ load levelling

Voltage/ Frequency regulation

Time shifting applications

### Flexible Compatibility

Can be AC coupled with String inverters

Compatible with wind, hydro and other sources as well

Seamless synchronisation with DG Sets

### Applications

Office Buildings | Mini Grids | Telecom BTS | Railway Signaling | Cold Storage | Process Industries

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# ALPHA SEOG SERIES

## Technical Datasheet

### SOLAR CHARGE CONTROLLER

| | 500VA | 1kVA | 1kVA | 2kVA | 3kVA | 4kVA | 4kVA | 5kVA | 6kVA | 7.5kVA | 8kVA |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DC Rated Voltage | 24V | | | 48V | | | 96V | | | 96/120V | |
| Charge Controller Type | MPPT | | | | | | | | | | |
| Charger Topology | Buck Type | | | | | | | | | | |
| No of MPPT Channel | 1 (Single Channel) | | | | | | | | | | |
| Solar PV Capacity | 500 W | 1 KW | 1 KW | 2 KW | 3 KW | 4 KW | 4 KW | 5 KW | 6 KW | 7.5 KW | 8 KW |
| Max. Open Circuit PV Volts (Voc) | 90 V | | | 190 V | | | | | 280 V | | |
| PV Voltage Range (Vmp) | 28-72 V | | | 70-160 V | | | | | 140-235 V | | |
| PV Minimum Voltage (Voc) | 30 V | | | 75 V | | | | | 150 V | | |
| Peak Charging Efficiency | 92% | | | | | | | | 94% | | |

### SOLAR INVERTER

| | |
|---|---|
| Output Voltage | 230 VAC Single Phase \| True Sine Wave |
| Output Frequency | 50 Hz |
| Priorty Modes | Mode 1 : Solar> Grid> Battery (Solar Priority Mode) |
| | Mode 2 : Solar> Battery> Grid (For Areas With Reliable Grid) |
| | Mode 3 : Solar> Grid> Battery* (Intelligent Mode For urban areas) |
| | Mode 4 : Battery Extra Backup Mode |
| | Mode 5 : Normal Home Inverter Mode |

| | 500VA | 1kVA | 1kVA | 2kVA | 3kVA | 4kVA | 4kVA | 5kVA | 6kVA | 7.5kVA | 8kVA |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Output Capacity (at 0.8 pf) | | | | | | | | | | | |
| Output Current | 1.73 A | 3.5 A | 3.5 A | 7.0 A | 10.5 A | 14 A | 14 A | 17.5 A | 21 A | 26 A | 28 A |
| Voltage Regulation | ± 2 % | | | | | | | | | | |
| Frequency Regulation | ± 0.5 Hz | | | | | | | | | | |
| THD | < 3 % | | | | | | | | | | |
| Power Factor | 0.99 | | | | | | | | | | |
| Efficiency (Peak) | 82% | 85% | | | 88% | | | | 90% | | |
| Over Load 10 seconds | | | | Upto 110% | | | | | Upto 200% | | |
| Changeover Time | <20 mSec | | | | | | | | | | |
| Load Bypass Feature | Provided | | | | | | | | | | |
| Operating Temprature | -10°C to 50°C | | | | | | | | | | |

### BATTERY

| | |
|---|---|
| Battery Types Supported | Lead Acid tubular \| VRLA \| NiCd \| LMLA |
| Battery Charging Process | 3 stage Battery Charging Process ( Bulk \| Absorb \| Float ) |

### GRID CHARGER

| | |
|---|---|
| I/P Voltage Range | 170-270 VAC |
| I/P Frequency range | 47-53 Hz |
| Peak Charging Efficiency | 80% |

### PROTECTIONS

| | | |
|---|---|---|
| AC Over Voltage | AC Under Frequency | Over Temprature |
| AC Under Voltage | Battery Over Voltage | PV ReversePolarity |
| O/P Overload | Battery Under Voltage | PV Surge Protection |
| O/P Short Circuit | Battery Reverse Polarity | PV Over Voltage |
| AC Over Frequency | Battery Current Limit | Galvanic Isolation |

### USER INTERFACE

#### A. DISPLAYED PARAMETERS

| | | |
|---|---|---|
| Inverter Voltage | Battery Voltage | PV Voltage |
| Inverter Current | Battery Current | PV Current |
| Inverter/Grid Frequency | Battery Temprature | PV kWH Cumulative |
| Inverter Load (KVA) | Battery Charging Mode | 30 days daily PV Kwh |
| Grid Voltage | System Temprature | Monthly Generated Kwh |
| Grid Current | PV Power (kW) | Yearly Generated Kwh |

#### B. FAULTS DISPLAYED ON LCD

| | |
|---|---|
| Inverter Under Voltage | Inverter Over Voltage |
| PV Unger Voltage | PV Over Voltage |
| Solar Charger Over Load | System Over Load |
| Battery Under Voltage | DC Over Voltage |
| AC Under Frequency | AC Over Frequency |
| System Trip/Off | System Over Temperature |

#### C. LED INDICATIONS

| | |
|---|---|
| System Power On | Load On Grid / Grid Charging / Grid Available |
| Inverter ON ( Load on Inverter) | Battery Under Voltage Shut |
| Solar Available / Solar Charging | System Trip / Fail |

#### D. REMOTE MONITORING

| | |
|---|---|
| RS 232 | All parameters on display can be remotely seen on PC/Laptop via provided GUI software. All logged parameters and can be saved in Excel Format. |
| GPRS | All parameters can be viewed over internet by accessing through a user ID and password (Add on Feature) |
| WiFI | Download the Energiaa lite app to easily observe all parameters of your SEOG series solar PCU (Add on Feature) |

#### E. DATA LOGGER PARAMETERS

PV kWH Cumulative | 30 days daily PV kWH | Monthly PV kWH | Yearly PV kWH

DATA LOGGING in Micro SD Card: All parameters can be logged in Micro SD memory ~~card as per date~~ /time stamp, logged parameter can be viewed in Laptop/PC system (Add on feature)

#### F. MISCELLANEOUS

| | | |
|---|---|---|
| Degree Of Protection | IP-21 | |
| Housing | Table Top | Floor Standing |
| Type of Cooling | Forced Fan Temperature Controlled | |

### APPROVALS

IC Test Certification IEC 61683, IEC 60068-2-(1,2,14,30), IEC 60529 (IP 21)

**NOTE:** In Grid charger mode/ Grid Bypass to Load Mode, the output available on load terminals is just the Grid supply present and not a regulated ouput.

**NOTE:** In charger mode,overload protection of 110%, 125% ,150%and 200% are not applicable. Only overload protection present are the Mains and Load MCB.

## AVAILABLE PRODUCTS VARIANTS FOR SOLAR APPLICATIONS

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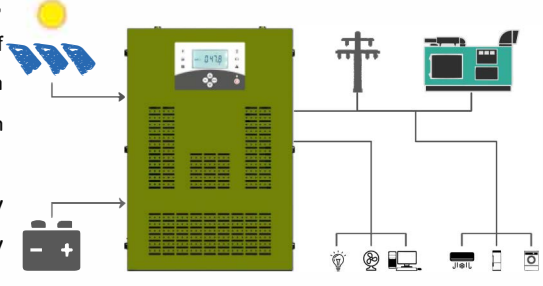
# OFF GRID SOLAR PCU

## ALPHA SEOG SERIES

Alpha's SEOG Series is the No.1 Trusted solar inverter technology in the African Market. Smart management of renewable Solar Power, Grid Supply and Battery allows it to deliver power seamlessly for all electrical applications, thus significantly reducing Diesel consumption and electricity bill. Built for high performance against the typically tough African grid conditions, ALPHA SEOG Series provides you an economical power solution and gives the benefit of optimal renewable energy, 365 days a year. Advanced DSP control technology and high efficiency MPPT gives you the maximum solar generation and a true sine wave so that even your sensitive appliances can run uninterrupted for a long time.

The **largest in-class LED display**, along with unparalleled service support and high reliability establishes the ALPHA SEOG series as the cost-effective package and benchmark technology for solar inverters in developing countries.

### Africa's First 5 Mode Solar Inverter



### 5 Mode Priority Selection

S>G>B | S>B>G | S>G>B* (Intelligent Mode)

Battery Extra Backup Mode

Normal Home Inverter Mode

### Industrial Grade Inverter

Designed for reliability against frequent grid variations

Transformer provides galvanic isolation and has a long life

Protective breakers at all inputs & outputs

### Monitoring

Largest LCD Display in its class for great visuals

Inbuilt data logging capability up to 5 years

RS 232, GPRS, WiFi remote monitoring available

### Plug N Play

Rewireable inline plugs for AC input and output

Ideal for solar integrators due to ease of installation

Designed for hassle free commissioning

### Applications

Residences | Petrol Pumps | Schools | Small offices | Rural Micro Grids | Hotels

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