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SOLAR KE SMART SOLUTIONS GHAR LE AAO!

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Solar



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ABOUT LIVGUARD

Livguard Energy Technologies Pvt. Ltd. (LETPL) one of India's leading providers for power energy solutions is poised to transform the world with its cutting edge technology, in solar solutions, power back-up, automotive solutions, & e-rickshaw batteries. Livguard was founded in the year 2014 and is a part of the SAR Group which has been serving the nation for the past three decades. With our technologically advanced toolkit and trained technicians we have achieved the customer's trust and faith in our products and services. This has helped us reach the 4,000 crore company milestone in a short period of time.

LIVGUARD SOLAR PRODUCT RANGE

SOLAR PANEL

40 WATT – 545 WATT



SOLAR MANAGEMENT UNIT

30 A - 50 A



SOLAR CHARGE CONTROLLER

10 A- 50 A



SOLAR BATTERY

40 AH – 240 AH



SOLAR UPS

700 VA – 2200 VA



PWM POWER CONDITIONING UNIT

3.5 KVA – 10 KVA



SOLAR UPS MPPT

1000 VA – 2500 VA



MPPT POWER CONDITIONING UNIT

3 KVA – 15 KVA



GRID INTERACTIVE HYBRID

- 1-PHASE : 3KVA - 5KVA
- 3-PHASE : 10KVA - 30KVA





SOLAR PANEL

Livguard Solar Panels are available in Poly-crystalline and Mono PERC PV cells, with IEC compliance ranging for 40Wp - 545Wp panels. Our Panels are ideally suited for rooftop and agricultural applications.

12* Years Product Warranty

25 Years Performance Warranty

Positive Power Tolerance

- Ensures full energy harvesting
- Ensures better return on investment



Excellent Performance in low light

- High quality transparent glass
- Glossy EVA to capture maximum solar energy



Suitable for Extreme Weather

- Tempered glass withstands dynamic wind load of 2400 Pa & snow load of 5400 Pa
- Multi EVA capsulation



Potential-Induced Degradation (PID) Resistance Technology

- For longer life and lower degradation

MODULE 12V

| Model Name | LGV12V40 | LGV12V50 | LGV12V75 | LGV12V100 | LGV12VS150 | LGV12V180M |
|---|----------|----------|----------|-----------|------------|------------|
| Power (pm) in Watts (Nominal) | 40 | 50 | 75 | 100 | 150 | 180 |
| No. of Cells | 36 | 36 | 36 | 36 | 32 | 32 |
| Rated Module Voltage | 12 | 12 | 12 | 12 | 12 | 12 |
| Voltage at Maximum Power (Vmp) in Volts | 17.5 | 18 | 18 | 18 | 16.9 | 18.01 |
| Current at Maximum Power (Imp) in Amps | 2.46 | 2.78 | 4.17 | 5.66 | 8.9 | 9.99 |
| Open Circuit Voltage (Voc) in Volts | 21 | 22 | 22 | 22 | 21.6 | 22.12 |
| Short Circuit Current (Isc) in Amps | 2.54 | 3.28 | 4.67 | 6.06 | 9.2 | 10.37 |
| Maximum System Voltage (Voc) | 600 | 600 | 600 | 600 | 1000 | 1000 |
| Module Efficiency η (%) | >12% | >12% | >14% | >14% | >16% | >18% |
| STC: Irradiance 1000W/M ² , Ambient Temperature 25°C, Air Mass 1.5, Measuring Tolerance \pm 3% | | | | | | |

MODULE 24V

| Model Name | LGV24VS335W | LGV24VS400WM | LGV24VS530WM | LGV24VS535WM | LGV24VS540WM | LGV24VS545WM |
|---|-------------|--------------|--------------|--------------|--------------|--------------|
| Power in Watts (Nominal) | 335 | 400 | 530 | 535 | 540 | 545 |
| No. of Cells | 72 | 72 | 144 | 144 | 144 | 144 |
| Rated Module Voltage | 24V | 24V | 24V | 24V | 24V | 24V |
| Voltage at Maximum Power (Vmp) | 38.3 | 41.2 | 41.36 | 41.43 | 41.81 | 42.02 |
| Current at Maximum Power (Imp) | 8.75 | 9.72 | 12.82 | 12.92 | 12.92 | 12.98 |
| Open Circuit Voltage (Voc) | 46.5 | 49.79 | 49.32 | 49.47 | 49.81 | 50.14 |
| Short Circuit Current (Isc) | 9.35 | 10.31 | 13.7 | 13.81 | 13.51 | 13.55 |
| Maximum System Voltage(VDC) | 1000 | 1500 | 1500 | 1500 | 1500 | 1500 |
| Module Efficiency η (%) | 17.35 | 20.17 | 20.54 | 20.94 | 20.94 | 21.12 |
| STC: Irradiance 1000W/M ² , , Ambient Temperature 25°C, Air Mass 1.5, Measuring Tolerance \pm 3% | | | | | | |

WARRANTY & CERTIFICATION

| | |
|-----------------------|---|
| Product Warranty* | 5 years for 12V Modules; 12 Years for 24V Modules |
| Performance Warranty* | 25 Years (90% module efficiency after 10 years, 80% module efficiency after 25 years) |
| Certificates | IS:14286, IS-61215, IS-61730 |

*Refer solar module warranty card document

Technical Parameters are subject to change without any prior notice



SOLAR MANAGEMENT UNIT

Livguard Solar Management Unit (SMU) converts any existing inverter into solar system. It has in-built intelligence to maximize use of solar energy and is ideal for various DC voltages.

Auto bypass during fault

1 Years Warranty

LCD Display

- Easy to operate, in-built interactive LCD Display
- Indicates alert & system status



Maximize Solar Yield

- Engineered to extract maximum power from solar, to reduce the electricity bill.



3 Stage Intelligent Battery Charge Profile

- Designed to track the battery charging profile (Bulk, Absorption, and Float)
- Enhances battery life.



Protections

- In-built short circuit, reverse current & polarity protection
- No risks of electric shocks



SOLAR MANAGEMENT UNIT

| Model Name | LSMU 122430 | | LSMU 24-4850 | | |
|------------------------------|----------------------------------|-------|------------------------|-----------|----------|
| Solar Management Unit Rating | 12/24V @ 30A | | 24V @ 50A | 36V @ 50A | 48V@ 50A |
| Technology | Micro Controller Unit based PWM | | | | |
| Type | Series Regulator Common Positive | | | | |
| System Voltage | 12V | 24V | 24V | 36V | 48V |
| Setting | Auto Sensing | | Settable (Default 48V) | | |
| Maximum Solar Panel (Wp) | 500W | 1000W | 1800W | 3600W | |
| Maximum Solar Panel Voltage | 50V | | 90V | | |

BATTERY SETTINGS

| | | | | | |
|---------------|---------|--------------|--------------|--------------|--------------|
| Bulk Voltage | Range | 13.9 - 15.9V | 27.9 - 31.8V | 41.7 - 47.7V | 55.6 - 63.6V |
| | Default | 14.2V | 28.4V | 42.6V | 56.8V |
| Float Voltage | Range | 13.3 - 14.1V | 26.6 - 28.2V | 39.9 - 42.3V | 53.2 - 56.4V |
| | Default | 13.5V | 27V | 40.5V | 54V |
| Low Battery | | 10.5 ± 0.2V | 21 ± 0.2V | 31.5 ± 0.2V | 42 ± 0.2V |

LOAD CONTROLLER

| Grid Disconnect from Inverter (Voltage) | After Battery goes to Bulk Charge Mode & PV Energy Available | | | | |
|---|--|---|---|---|---|
| Grid Re-connect to Inverter (Voltage) | 12.7V Default Setting Settable Range: 11.4 - 13.3V | 25.4V Default Setting Settable Range: 22.8 - 26.6V | 25.4V Default Setting Settable Range: 22.8 - 26.6V | 38.1V Default Setting Settable Range: 34.2 - 39.9V | 50.8V Default Setting Settable Range: 45.6 - 53.2V |

PROTECTIONS & USER INTERFACE

| Protection | | <ul style="list-style-type: none">• Reverse Polarity for PV/Battery, Short Circuit, Battery Overcharge & Deep Discharge |
|----------------|-----------------|---|
| User Interface | LED Indications | <ul style="list-style-type: none">• Faults: Battery Low & High, Reverse Current, Panel Charging Overcurrent |
| | | <ul style="list-style-type: none">• Battery Charging Status |
| | LCD Display | <ul style="list-style-type: none">• PV Current/Voltage |
| | | <ul style="list-style-type: none">• Battery Current/Voltage |
| | | <ul style="list-style-type: none">• Faults: Battery Low & High, Reverse Current, Charging Overcurrent |
| | | <ul style="list-style-type: none">• KWh Generated from Solar (Cumulative - kWh, Instantaneous - KW) |

GENERAL

| | | |
|--------------------------|---------------|----------------|
| Operating Temperature | 0°C to 50°C | |
| Dimensions (LxWxH) in mm | 205 x 113 x70 | 264 x 183 x 90 |
| Weight (Kg) | 0.8 | 1.57 |

Technical Parameters are subject to change without any prior notice



SOLAR CHARGE CONTROLLER

Livguard Solar Charge Controller is an advanced micro controller unit based on PWM technology. The charging process has been optimized for longer battery life and improved system efficiency.



Dusk
to Dawn

1

Years
Warranty

Increase Battery Life /Gravity Builder

- Designed to remove sulphate build up
- A high equalizing charged battery



Automatic Voltage Selection

- Auto battery selection upto 20 A
- Settable battery selection for 50 A



USB Port

- USB Port available for mobile charging
- For 20A plug in your DC devices such as fans and lights



Protections

- In-built short circuit , reverse current & polarity protection
- No risk of electric shocks



SOLAR CHARGE CONTROLLER

| Model Name | LSCC 122410 | LSCC 122420 | LSCC 24-4850 | | |
|---------------------------------|----------------------------------|--------------------------|-------------------------|----------|----------|
| Charge Controller Rating (Amp.) | 12/24V @ 10A | 12/24V @ 20A | 24V @ 50A | 36V@ 50A | 48V@ 50A |
| Technology | Micro Controller Unit Based PWM | | | | |
| Type | Series Regulator Common Positive | | | | |
| System Voltage | 12 / 24 V | | 24 / 36 / 48V | | |
| Setting | Auto Sensing | | Settable (Default 48 V) | | |
| Maximum Solar Panel (Wp) | 12V @ 160W 24V @ 335W | 12V @ 335W 24V @ 600W | 1800W | 3600 W | |
| Maximum Solar Panel Voltage | 60V | | 90V | | |

BATTERY SETTINGS

| Voltage | 12V | 24V | 24V | 36V | 48V |
|-------------------------|--------------|--------------|---------------|---------------|---------------|
| Bulk Voltage (V) | 14.2V | 28.4 | 27.8V - 31.8V | 41.7V - 47.7V | 55.6V - 63.6V |
| Default Voltage (Bulk) | | 28.4V | | 42.6V | 56.8V |
| Float Voltage (V) | 13.5 | 27V | 26.6V - 28.2V | 39.9V - 42.3V | 53.2V - 56.4V |
| Default Voltage (Float) | | 27V | | 40.5V | 54V |
| Low Battery (V) | 10.5V ± 0.2V | 21.0V ± 0.2V | | 31.5V ± 0.2V | 42.0V ± 0.2V |

PROTECTIONS & USER INTERFACE

| Protection | | • Reverse Polarity (Panel/Battery), Short Circuit, Battery Overcharge & Deep Discharge | | | |
|----------------|-----------------------|--|--|---|--|
| User Interface | Display & Indications | LED | | LED & LCD | |
| | LED Indications | • Faults: Battery Low & High, Reverse Current, Panel Charging Overcurrent | | | |
| | | • Battery Charging Status | | | |
| | LCD Display | NA | | • Solar PV Power | |
| | | | | • Battery Voltage | |
| | | | | • Charging Mode | |
| | | | | • Load On/Off | |
| | | | | • Faults: Battery Low & High, Reverse Current, Charging Overcurrent | |
| | | • Charging Status | | | |

GENERAL

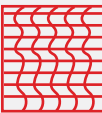
| Operating Temperature | 0°C to 50°C | | |
|--------------------------|----------------|----------------|----------------|
| Dimensions (LxWxH) in mm | 112 x 125 x 25 | 125 x 100 x 45 | 264 x 183 x 90 |
| Net Weight (Kg) | 0.32 | 0.45 | 1.48 |

Technical Parameters are subject to change without any prior notice



SOLAR BATTERY

Livguard Solar Batteries are C10 rated deep cycle batteries. Innovative Super Tuff 3D design and extra thick tubular plates gives longer backup & battery life.

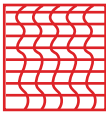


Super Tuff
3D design Plates

Up to **5** Years
Warranty

Super Tuff 3D Grid

- Industry's 1st 3D design with double side pasting
- Ensures longer battery life



Superior Life Cycle

- Ensures longer battery service life
- Life Cycle- 2000 at 80% depth of discharge at Room Temperature



Tuff Futuristic Design

- Advanced premium design
- Robust high quality durable material



Ultra Low Maintenance

- Topping up frequency – Initially 8 to 10 Months



SOLAR BATTERY

| Model Name | Nominal Voltage (V) | Capacity @ C10 (Ah) | Battery Weight with Acid ± 3% (Kg) | Overall Dimension | | | Free Replacement (Months) | Pro Rata Warranty (Months) |
|------------|---------------------|---------------------|------------------------------------|-------------------|--------------|---------------|---------------------------|----------------------------|
| | | | | Length ± 3 mm | width ± 3 mm | Height ± 3 mm | | |
| LS4036ST | 12 | 40 | 23.4 | 410 | 175 | 235 | 0 - 36 | - |
| LS7536ST | 12 | 75 | 30.1 | 410 | 175 | 271 | 0 - 36 | - |
| LS10060TT | 12 | 100 | 52.3 | 505 | 188 | 410 | 0 - 60 | - |
| LS13560TT | 12 | 135 | 55.7 | 505 | 188 | 410 | 0 - 60 | - |
| LS15060PTT | 12 | 150 | 53.2 | 505 | 188 | 410 | 0 - 36 | 37 - 60 |
| LS16560TT | 12 | 165 | 55 | 505 | 188 | 410 | 0 - 60 | - |
| LS18060PTT | 12 | 180 | 57.5 | 505 | 188 | 410 | 0 - 36 | 37 - 60 |
| LS20060TT | 12 | 200 | 63.4 | 505 | 188 | 410 | 0 - 60 | - |
| LS24060PTT | 12 | 240 | 70.0 | 505 | 188 | 410 | 0 - 36 | 37 - 60 |

Note: Battery Capacity is C10 upto 1.80 Volts per Cell at 27°C

Applications

- Solar Rooftop Projects
- Solar Home Lights
- Solar Street Lights
- Solar UPS
- Solar Management Unit
- Solar Charge Controller
- Telecom Towers



SOLAR UPS

Livguard Solar Hybrid UPS provides power from solar battery and grid as per the load profile. It has the highest rated solar charge controller which extracts maximum power from solar modules and reduces electricity bills.



Highest Rated Solar Charge Controller



Auto bypass during fault

2 Years Warranty

Real Time Clock (RTC) Technology

- In-built intelligence RTC to maximize solar energy utilization.
- Optimized solar energy utilization based on localized power situation



Fast Battery Charging

- In-built 50A solar charge controller Charges the battery in short time



Safety & Protection

- In-built Inverter, panel, & battery protections
- Under/over voltage protection in bypass mode



User Friendly LCD Display

- Easy to operate, in-built interactive LCD display indicates alarm & system status including solar generation



UPS/Normal Mode

- Suitable for computer load as well as areas with low voltage



Pure Sine Wave

- Noiseless operations & long life of electrical appliances



SOLAR UPS

| Model Name | LS OG950 | LS OG1150+ | LS OG1750/12V | LS OG1850+ | LS OG2250+ |
|-------------------------------|----------------|------------|---------------|------------|------------|
| System Rating | 700 VA | 900 VA | 1500 VA | 1500 VA | 2200 VA |
| Nominal Battery Voltage (Vdc) | 12 V | | | 24 V | |
| Output Waveform | Pure Sine Wave | | | | |
| Switching Element | MOSFET | | | | |

SOLAR PV INPUT

| | | | | | |
|----------------------------------|-----------|--|--|-----------|--|
| Technology | PWM | | | | |
| Charge Controller Rating (Amps.) | 50 A | | | | |
| Maximum Solar Panel (Wp) | 900 Wp | | | 2000 Wp | |
| Input Voltage Range (Vmp) | 14.5-18 V | | | 29 - 42 V | |
| Maximum Input Voltage (Voc) | 25 V | | | 50V | |

GRID INPUT

| | | | | | |
|--|--------------------------|--|--|--|--|
| Input Supply | Single Phase -230V, 50Hz | | | | |
| Operating Voltage Range (Normal Mode) | 90 V - 290 V | | | | |
| Operating Voltage Range (UPS Mode) | 180 V - 260 V | | | | |

OUTPUT

| | | | | | |
|----------------------------------|-----------|--|---------|--|--|
| No Load Output Voltage | 225V + 7V | | | | |
| Output Frequency Battery Mode | 50 ± 1Hz | | | | |
| No Load Current (UPS Switch Off) | ≤ 180mA | | ≤ 200mA | | |

BATTERY

| | | | | | |
|---|---|------|------|------|------|
| Battery Charging through Mains + (NC) | 10 A | 13 A | 17 A | 13 A | 14 A |
| Battery Charging through Mains + (HC) | 13 A | 17 A | 24 A | 17 A | 20 A |
| Battery Charging through Solar (Default) | 40 A | | | | |
| Charging Current @100V AC | >8 A | | | | |
| Low Battery Indication | 10.8± 0.2V | | | | |
| Low Battery Trip | 10.6± 0.2V | | | | |
| Solar Optimization after Battery is Fully Charged | If Solar is Available - then Load is Handled by Battery & Solar | | | | |

OVERLOAD , PROTECTION , LCD DISPLAY & USER INTERFACE

| | |
|-------------------------------|--|
| Overload Shutdown Indication | Display Overload & Alarm |
| Overload Pre-Alarm Indication | Display Overload with Load % Alarm |
| Overload Capacity | 110% Load Running at 3 Sec |
| Protection | Thermal Trip , OverLoad with % , Short Circuit , Battery Low , PV Reverse , Fuse Trip |
| LCD Display | Mains Voltage / Output Voltage , Battery Voltage , Load(%), Battery Low , Solar KWH Solar Current on Load , Solar Charging Current , Overload with (%), PV Reverse, Short Circuit. |
| User Interface | Battery Boost Voltage , Battery Low Cut Voltage, Max, Grid Charging Current, Max. Solar Charging Current. |

GENERAL

| | | | | | |
|--|-------------|-----------------|-------------|-----------------|-----------------|
| Operating Temperature | 0°C to 50°C | | | | |
| Dimensions(LxWxH) in mm | 335*325*180 | 295 X 330 X 170 | 335*325*180 | 363 X 398 X 251 | 365 X 400 X 250 |
| Net Weight (Kg) | 7.52 | 10 | 11.36 | 15 | 16.5 |
| Technical Parameters are Subject to Change Without any Prior Notice. | | | | | |



PWM POWER CONDITIONING UNIT

Livguard Solar Hybrid PCUs are high capacity, high efficiency solar UPS that runs both on solar & utility (grid) power supply. It has an in-build solar charge controller which extracts maximum power from solar modules to power your appliances & battery charging.

LCD & LED Display

2 Years
Warranty

Real Time Clock (RTC) Technology

- In-built intelligence RTC to maximize solar energy utilization.
- Optimized solar energy utilization based on localized power situation



Fast Battery Charging

- In-built 50/70 Amp solar charge controller that charges the battery in short time



Safety & Protection

- In-built human, panel, & battery protections
- No risk of electric shocks



User Friendly LCD Display

- Easy to operate, in-built interactive LCD display indicates alarm & system status including solar generation



UPS Mode

- Suitable for computer load as well as areas with low voltage



Pure Sine Wave

- Noiseless operations & long life of electrical appliances



PWM POWER CONDITIONING UNIT

| Model Name | LS OGR3500 | LS OGR5048 | LS OGR7500 | LS OGR10000 |
|-------------------------------|----------------|------------|------------|-------------|
| System Rating | 3.5 KVA | 5 KVA | 7.5 KVA | 10 KVA |
| Nominal Battery Voltage (Vdc) | 48V | 48V | 120V | 120V |
| Ouput Waveform | Pure Sine Wave | | | |
| Switching Element | MOSFET | | | |

SOLAR PV INPUT

| Technology | PWM | | | |
|----------------------------------|-------|-------|-------|--------|
| Charge Controller Rating (Amps.) | 50 A | 70 A | 50 A | 70 A |
| Maximum Solar Panel (Wp) | 3400W | 5600W | 8500W | 11900W |
| Maximum Input Voltage (Vmp) | 82.4 | 82.4 | 188 | 188 |
| Maximum Input Voltage (Voc) | 100 | 100 | 230 | 230 |

GRID INPUT

| | |
|-------------------------|-----------------------------|
| Input Supply | Single Phase - 230 V; 50 Hz |
| Nominal Voltage Range | 100 - 280V |
| Nominal Frequency Range | 45 - 55Hz |

OUTPUT

| | | | | |
|----------------------------|----------------|------------|--------|--------|
| Nominal Output (Vac) | 220V \pm 7V | | | |
| Nominal Frequency | 50Hz \pm 1Hz | | | |
| Nominal Output Current (A) | 12.5Amp. | 17.5Amp. | 27Amp. | 35Amp. |
| UPS Efficiency | \geq 80% | \geq 85% | | |

BATTERY

| | | | |
|---|---------|---------|---------|
| Battery Recharge Current Range from Grid Side (A) | 5 - 18A | 5 - 16A | 5 - 20A |
| Default Value Battery Recharge Current Range from Grid Side (A) | 18A | 16A | 20A |
| Battery Recharge Current Range from PV Side (A) | 5 - 50A | | |

PROTECTION, USER INTERFACE & SETTING

| | |
|--------------|---|
| Protection | Thermal Trip, Over load with %, Short Circuit, Battery Low, PV Reverse, MCB Trip |
| LCD Display | Mains on/off/cut, Mains Voltage, Battery Voltage, Battery Charging/Charged, Mode: UPS/Normal Load (%), Solar On/Off, Solar to Load (A), Solar to Battery (A) |
| Indications | Inverter: On/Off, Charging: high/low, Mode: UPS/Normal, Mode: Hybrid |
| User Setting | Battery Boost Voltage, Battery Low Cut Voltage, Max. Grid Charging Current, Max. Solar Charging Current |

ENVIRONMENT

| | |
|---|---------------|
| IP Protection Level | IP-20 |
| Operating Temperature (°C) | 0 to + 55°C |
| Max Relative Humidity @ 25°C | 0-95% |
| Max. Altitude above Sea Level without De-rating (M) | \leq 1000 m |

PHYSICAL

| | | | | |
|-----------------------------|-----------------|-----------------|-----------------|-----------------|
| Dimension (W x D x H) in mm | 370 x 400 x 320 | 370 x 510 x 550 | 370 x 530 x 620 | 370 x 530 x 620 |
| Net Weight (Kg) | 28.97 | 43.79 | 64.57 | 67.28 |
| Gross Weight (Kg) | 31.3 | 46.5 | 69.6 | 70.8 |

Technical Parameters are subject to change without any prior notice



MPPT - SOLAR UPS

MPPT Solar UPS are high efficiency Solar Inverter which comes with Interleaved MPPT technology to extract Solar energy with minimum losses. This solar inverter has RTC (Real Time Clock) feature, that renders optimum solar power and also manages your grid usage to provide maximum savings.



***35% Enhanced solar generation**



Next-Gen MPPT Technology

2 Years Warranty

Upto 35% more Solar Generation

- Increased Solar output w.r.t Solar PWM technology



Advanced Interleaved MPPT Technology

- More than 95% efficiency in Solar Inverters
- Minimized losses



Integrated Protections for More safety

- Battery Low, Over Temp, Short Circuit protections.
- 150% Overload Capacity



Real-Time Clock (RTC) feature

- In-Built RTC Logics for prioritizing, battery/grid to get more backup and savings



UPS/Normal Mode

- Suitable for computer load as well as areas with low voltage



Smart Solar Selection

- Three Different Saving Levels for maximum Solar Utilization.
- Normal/SGB/SBG



MPPT - Solar UPS

| Model Name: | LS OG1000M | LS OG2200M | LS OG2500M |
|---|-------------|-------------|-------------|
| Product Specification Range of MPPT Solar PCU | 1000VA /12V | 2200VA /24V | 2500VA /24V |
| Battery Voltage (Nominal) | 12V | 24V | 24V |

Mains Input Mode

| | | |
|--|--|-----------|
| Mains AC Low Cut (UPS Mode) | 180 ± 10V | |
| Mains AC Low Cut Recovery (UPS Mode) | 9-12V Hysterisis from > Low Cut Voltage | |
| Mains AC High Cut (UPS Mode) | 270 ± 10V | |
| Mains AC High Cut Recovery (UPS Mode) | 9-12V Hysterisis from > High Cut Voltage | |
| Mains AC Low Cut (Wide Range Mode) | 90 ± 10V | 100 ± 10V |
| Mains AC Low Cut Recovery (Wide range Mode) | 9-12V Hysterisis from > Low Cut Voltage | |
| Mains AC High Cut (Wide Range Mode) | 290 ± 10V | |
| Mains AC High Cut Recovery (Wide Range Mode) | 9-12V Hysterisis from > High Cut Voltage | |
| Input Frequency Range | 45-55 Hz | |

Backup Mode

| | | |
|--------------------------------|----------------|----------|
| Output Voltage | 225± 7 V | |
| Output Frequency | 50 ± 1 Hz | |
| Output Waveform | PURE SINE WAVE | |
| No Load Current (Switch OFF) | ≤ 180 mA | |
| Low Battery Warning | 10.8V ± 0.2 V | |
| Low Battery Cut | 10.6V ± 0.2 V | |
| Change Over Time (Normal Mode) | ≤ 20msec | ≤ 40msec |
| Change Over Time (UPS Mode) | ≤ 10msec | |

Battery

| | | | |
|---------------------------------------|--------------------------|---------|---|
| Battery Quantity (12V 100Ah to 220Ah) | 1 | 2 | 2 |
| Float Charging Voltage (Per Battery) | 13.7 ± 0.2VDC (Default) | | |
| Boost Charging Voltage(Per Battery) | 14.4 ± 0.2VDC (Deafult) | | |
| Charging Current By Grid (NC) | 13.5 ± 1A | 15 ± 1A | |
| Charging Current By Grid (HC) | 18 ± 1A | 20 ± 1A | |
| Charging Current By PV (default) | 40A (settable 5A to 50A) | | |

Solar Charge Controller

| | | | |
|--|--------------------------|---------|----------|
| Solar Charge Controller Type | MPPT Interleaved Channel | | |
| Max Panel Wattage That Can Be Connected | 800W | 2500W | 3200W |
| Max. input Current per Channel (Maximum Isc) | (30±1)A | (30±1)A | (40±1) A |
| Maximum PV Voltage Voc | 60V | 110V | 110V |
| Minimum PV Voltage Vmp | 25V | 36V | 36V |
| Maximum PV Voltage Vmp | 50V | 88V | 88V |
| MPPT Charger Efficiency (peak) | ≥92% | ≥95% | |

Protections, User Interface, Settings

| | |
|-----------------|--|
| Protections | Battery Low, Overload, Over temperature, Output Short Circuit, Mains MCB/Fuse Trip, PV Reverse |
| LCD Display | AC Mains Voltage, O/p Load %, Battery Input Voltage, Battery Charging/charged Solar KWH, Solar Current on Load, Solar Current on Battery, Mains On, Output Voltage, Time |
| Operation Modes | 1. Saving Level 1 - Normal Mode |
| | 2. Saving Level 2 - SGB Mode |
| | 3. Saving Level 2 - SBG Mode |

Environment

| | | |
|-------------------------------|-------------------|--|
| Protection Class | IP20 (indoor Use) | |
| Operating Temperature | 0 to 55°C | |
| Max Relative Humidity at 25°C | 0-95% | |

Dimensions

| | | | | |
|------------------------------|-------------|-------------|-------------|-------------|
| Dimensions in mm (LXWXH) | | 314X276X232 | 314X276X232 | 314X276X232 |
| Box Dimensions in mm (LXWXH) | | 380X375X320 | 380X375X320 | 380X375X320 |
| Weight in Kg | NetWeight | 12.260Kg | 17.00Kg | 19.33Kg |
| | GrossWeight | 13.530Kg | 18.370Kg | 20.70Kg |

NOTE: Specifications are subject to change without prior notice



MPPT POWER CONDITIONING UNIT

LCD & LED Display

5 Years
Warranty

Livguard Solar Hybrid MPPT HKVA Inverters are high capacity, enhanced efficiency solar PCU that runs both on solar & utility (grid) power supply. It comes with Priority Mode (ECO/GRID/NONSOLAR) feature for maximizing savings and extended backup. Advanced MPPT algorithm extracts maximum power from PV modules to both run your appliances and charge your batteries.

FEATURES

Enhanced Solar Power Utilization with Priority Mode

- No PV overload tripping via limiting feature to ensure generation does not fully stop
- Greater PV power allowed per KVA along with a wide MPPT voltage range



Fast Battery Charging

- Charging from Grid + Solar
- Multiple Battery Selection available, Flat/Tubular/VRLA



Safety & Protection

- Smart thermal management
- In-built battery, inverter and panel protection
- MCB protection at all Inputs and Outputs



UPS/Unregulated Mode

- Wide range for poor grids where voltage frequently comes down



Best in Class Overload Capability

- Upto 200% overload for peak surges
- Multiple overload attempts allowed



Pure Sine Wave

- Noiseless & long life operations of electrical appliances.



MPPT POWER CONDITIONING UNIT

| Model No. | LS OG3048M | LS OG5048M | LS OG7500M | LS OG10000M | LS OG15000M |
|---|------------|------------|------------|-------------|-------------|
| Product Specification Range of MPPT Solar PCU | 3KVA/48V | 5KVA/48V | 7.5KVA/96V | 10KVA/120V | 15KVA/240V |

MAINS INPUT MODE

| | | |
|--|--|----------|
| Mains AC Low Cut (UPS Mode) | 180 ± 5V | 170 ± 5V |
| Mains AC Low Cut Recovery (UPS Mode) | 9-12V Hysterisis from > Low Cut Voltage | |
| Mains AC High Cut (UPS Mode) | 260 ± 5V | 270 ± 5V |
| Mains AC High Cut Recovery (UPS Mode) | 9-12V Hysterisis from < High Cut Voltage | |
| Mains AC Low Cut (Wide Range Mode) | 120 ± 5V | 170 ± 5V |
| Mains AC Low Cut Recovery (Wide range Mode) | 9-12V Hysterisis > Low Cut Voltage | |
| Mains AC High Cut (Wide Range Mode) | 280 ± 5V | 270 ± 5V |
| Mains AC High Cut Recovery (Wide Range Mode) | 9-12V Hysterisis < High Cut Voltage | |
| Input Frequency Range | 50 ± 5% Hz | |
| Output voltage in Mains mode | Same as Mains Input | |
| Output frequency in Mains mode | Same as Mains Input | |

BATTERY

| | | | | | |
|--|-------------------------------------|-------------|-------------|-------------|-------------|
| Battery Type | TUBULAR | | | | |
| | VRLA | | | | |
| | FLAT PLATE | | | | |
| DC Input Voltage (Nominal) | 48V | 48V | 96V | 120V | 240V |
| Battery Quantity (12V 100Ah to 220Ah) | 4 | 4 | 8 | 10 | 20 |
| Float Charging Voltage (Tubular/VRLA/Flat Plate) | 13.2/13.5/13.4 (per Battery) ± .5V | | | | |
| Boost Charging Voltage(Tubular/VRLA/Flat Plate) | 14.5/13.8/13.7 (per Battery) ± .5V | | | | |
| Boost Charging Voltage Range for Tubular and SMF Battery | Provided Above | | | | |
| Bulk Absorption Battery Voltage | Same as Above | | | | |
| Battery Deep Discharge Recovery | YES | | | | |
| Charging Current By Grid | 20.0 ± 1.0A | 30.0 ± 1.0A | 25.0 ± 1.0A | 35.0 ± 1.0A | 30.0 ± 1.0A |
| Charging Current By PV | Provided Above | | | | |

BACKUP MODE

| | | | | | |
|--|--------------------------------------|-----------------|--------------|--------------|--------------|
| Output Voltage | 230 ± 2% V | | | | |
| Output Frequency | 50 ± 0.5 Hz | | | | |
| Output Waveform | PURE SINE WAVE | | | | |
| No Load Current (Switch OFF) | Sleep Mode is not Provided Currently | | | | |
| Discharging Current @ Full Load | 10.5 A± 1 Amp. | 17.5 A ± 1 Amp. | 26 A± 1 Amp. | 35 A± 1 Amp. | 52 A± 1 Amp. |
| Low Battery Warning | 11.1V (per Battery) ± 0.2V | | | | |
| Low Battery Cut | 10.8V (per Battery) ± 0.2V | | | | |
| Change Over Time From Mains To Inverter (Unregulated Mode) | ≤ 25 msec | | ≤ 25 msec | | |
| Change Over Time From Inverter To Mains (Unregulated Mode) | ≤ 25 msec | | ≤ 25 msec | | |
| Change Over Time From Mains To Inverter (UPS Mode) | ≤ 20 msec | | ≤ 25 msec | | |
| Change Over Time From Without Inverter To Mains (UPS Mode) | ≤ 20 msec | | ≤ 25 msec | | |
| Cooling | FORCED COOLING BY FAN | | | | |

PROTECTIONS

| | |
|---|----------------|
| Overload in Backup Mode | YES |
| Short Circuit in Backup Mode | YES |
| Short Circuit in Mains Mode | Mains MCB Trip |
| Backfeed | YES |
| Over Temperature | YES |
| Reverse Battery | YES |
| Phase to Phase Protection in Mains Mode | YES |

SOLAR CHARGE CONTROLLER

| | | | | | |
|---|-------------|------------|-------------|------------|------------|
| Solar Charge Controller Type | MPPT | | | | |
| Max Panel Wattage That Can Be Connected | 3300W | 5500W | 8250W | 11000W | 16500W |
| Max No. of (@335 Wp) Panels Connected (S:Series, P: Parallel) | S: 3, P: 3 | S: 4, P: 4 | S: 7, P: 4 | S: 7, P: 5 | S:12,P:4 |
| Min No. of (@335 Wp) Panels Connected (S:Series, P: Parallel) | S: 3, P: 1 | S: 3, P: 1 | S: 5, P: 1 | S: 5, P: 1 | S:10,P:1 |
| No. of Input Channel | 1 | 1 | 1 | 1 | 1 |
| Max. input Current per Channel (Maximum Isc) | (30 ± 1)A | (50 ± 1)A | (50 ± 1)A | (57 ± 1)A | (57 ± 1)A |
| Maximum PV Voltage Voc | (190 ± 5)V | | (320 ± 5)V | | (700 ±5)V |
| Minimum PV Voltage Vmp | 70V | | 175V | | 350V |
| Maximum PV Voltage Vmp | (160 ± 5)V | | (266 ± 5)V | | (560 ± 5)V |

MPPT POWER CONDITIONING UNIT

| Solar Charge Controller | | | | | |
|----------------------------------|--|------|-----|-----|-----|
| Maximum Battery Current | 60A | 100A | 75A | 80A | 60A |
| MPPT Charger Efficiency (Peak) | 94% | | 95% | | |
| Reverse PV Protection | YES | | | | |
| Reverse Current Flow to PV | NO | | | | |
| Switching Element(MPPT Charger) | IGBT | | | | |
| DOD (Depth of Discharge) | As per battery voltage setting (1.8V/cell) | | | | |

DISPLAY AND ALARMS

| | |
|-------------------------------------|---|
| LCD Display Parameters | 1. Battery Voltage & Current |
| | 2. PV Voltage & Current |
| | 3. PV Power, Total Generation & Today's Genration |
| | 4. Mains Voltage & Frequency |
| | 5. Load Voltage, Current & Frequency (Inverter Mode Only) |
| | 6. Load Power |
| | 7. Battrey Charging/Discharging Status |
| | 8. Time & Date |
| | 9. User Settings & Factory Settings |
| LCD Fault/Protection Status Display | i) Overload |
| | ii) Short Circuit |
| | iii) Battery & PV Reverse Polarity |
| | iv) Battrey Over/Under Voltage |
| | v) Battery Current Limit |
| | vi) Mains Over/Under Voltage |
| | vii) System Over Temprature |
| | viii) Grid/Load/PV Surge Protection(MOV) |
| Buzzer | YES |

SAFETY

| | |
|-------------------------|-----|
| HV Test Input to Earth | YES |
| HV Test Output to Earth | YES |
| IR Test Input to Earth | YES |
| IR Test Output to Earth | YES |

ENVIRONMENT

| | |
|-----------------------------|-----------------------|
| Operating Temperature | 0°C to 50°C |
| Storage Temperature | 10°C to 70°C |
| Operating Relative Humidity | 5-95% (Non-condensed) |

DIMENSIONS

| | | | | | |
|------------------------------|--------------|---------------|---------------|---------------|---------------|
| Dimensions in mm (LXWXH) | 325X295X415 | 448.5X275X611 | 650X400X753.5 | 650X400X753.5 | 650X450X753.5 |
| Box Dimensions in mm (LXWXH) | 680X345X510 | 680X345X510 | 835X495X800 | 835X495X800 | 835X565X800 |
| Weight in Kg | Net Weight | 31.0Kg | 52.95Kg | 97.5Kg | 104.35Kg |
| | Gross Weight | 33.5Kg | 55.55Kg | 109.85Kg | 116.70Kg |

NOTE: Specifications are subject to change without prior notice



GIH INVERTER - 1 PHASE

Grid Interactive Hybrid Inverters are also known as GIH inverters. With a wide operating temperature range and suitable for operation in harsh environments, these machines are a perfect fit for low maintenance, off-grid/ hybrid installations of industrial and residential nature both.



Smart Charging Control

5 Years Warranty

Priority/Non-Priority Solar operation

- Use Solar Power for both type of Loads.
- Connect Upto 20Kva Load on Non-Priority.



Scheduled Grid Usage

- Manage start/stop battery charging from grid/solar effectively
- Limit Import Power from Grid



3-Stage Battery Charging

- Float, Bulk & Equalization
- Ensure long life of the battery



In-Built Zero Export

- No separate device required.
- Use Solar On-Grid without Net Metering.



MPPT-Based Solar Charge Controller

- Highly Efficient MPPT technology for maximum solar utilization.



10 ms

Seamless Switching <10ms

- Switch between inverter/mains without any interruptions.

GRID INTERACTIVE HYBRID INVERTER - 1 PHASE

| Model Name | LS 103GIHT | LS 105GIHT |
|------------|------------|------------|
| Capacity | 3KVA | 5KVA |

MAINS INPUT MODE

| | | |
|----------------------------|--|----------|
| Mains AC Low Cut | 170 ± 5V | 170 ± 5V |
| Mains AC Low Cut Recovery | 10V Hysteresis from > Low Cut Voltage | |
| Mains AC High Cut | 265 ± 5V | 265 ± 5V |
| Mains AC High Cut Recovery | 10V Hysteresis from < High Cut Voltage | |
| Input Frequency Range | 47-53Hz | |

MAINS EXPORT MODE

| | | |
|---|--|-------|
| Inverter output voltage in Grid export mode | Same as Mains Voltage | |
| Full Scale Export Power | 2400W | 4000W |
| Export Power Control | Can be Done from Front Panel by using Load Following Mode Load Following ON: Zero Export Activated, Load Following OFF: Export Mode Activated | |

BATTERY

| | | |
|--|-------------------------------------|--------------|
| Battery Type | TUBULAR/FLAT/VRLA | |
| DC Input Voltage (Nominal) | 48V | |
| Battery Quantity (12V 100Ah to 220Ah) | 4 | |
| Float Charging Voltage (Tubular/ VRLA/ Flat Plate) | 13.2/13.5/13.4 (per Battery) ± .5V | |
| Bulk Charging Voltage(Tubular/ VRLA/ Flat Plate) | 14.5/13.8/13.7 (per Battery) ± .5V | |
| Battery Deep Discharge Recovery | YES | |
| Default Charging Current By Grid | Half of Solar Charging Current | |
| Max Charging Current By PV | 60.0 ± 1.0A | 100.0 ± 1.0A |

BACKUP MODE

| | | |
|----------------------------|-----------------------------|-----------------|
| Output Voltage | 230 ± 2% V | |
| Output Frequency | 50 ± 0.5 Hz | |
| Output Waveform | PURE SINE WAVE | |
| Maximum No Load losses | <100W | <150W |
| Max Nominal output current | 10.5 A± 1 Amp. | 17.5 A ± 1 Amp. |
| Low Battery Warning | 11.1V (per Battery) ± 0.2V | |
| Low Battery Cut | 10.8V (per Battery) ± 0.2V | |
| Change Over Time | ≤ 10 msec | ≤ 10msec |

PROTECTIONS

| |
|--|
| Overload in Backup Mode, Short Circuit (Backup/Mains), Over Temperature, Reverse battery, MOV for Grid/Load/PV Surge |
|--|

SOLAR CHARGE CONTROLLER

| | | |
|--|-------------|-----------|
| Solar Charge Controller Type | MPPT | |
| Max Panel Wattage That Can Be Connected | 3300W | 5500W |
| No. of Input Channel | 1 | 1 |
| Max. input Current per Channel (Maximum Isc) | (30 ± 1)A | (50 ± 1)A |
| Maximum PV Voltage Voc | (190 ± 5)V | |
| Minimum PV Voltage Vmp | 70V | |
| Maximum PV Voltage Vmp | (160 ± 5)V | |
| Maximum Battery Current | 60A | 100A |
| MPPT Charger Efficiency (Peak) | 94% | |
| Reverse PV Protection | YES | |
| Reverse Current Flow to PV | NO | |
| Switching Element(MPPT Charger) | IGBT | |

MODES OF OPERATIONS

| | |
|---------------------------------|---|
| Modes Available (User Settable) | i). Hybrid with Export ii). Hybrid with Zero Export iii). Stand alone (Similar to MPPT) |
|---------------------------------|---|

DISPLAY AND ALARMS

| |
|---|
| Battery Voltage & Current, PV Voltage, Solar Charger O/P Current, Solar KWH, Total KWH, Mains Voltage, Power, Frequency, Load Power, Current & Frequency, Battery Charging Status, Time, Date |
|---|

LCD FAULT/PROTECTION STATUS DISPLAY

| |
|---|
| Overload, Over Current, Battery Over/Under Voltage, Mains Over/Under Voltage, System Over Temperature |
|---|

ENVIRONMENT

| | |
|-----------------------------|-----------------------|
| Operating Temperature | 0°C to 50°C |
| Operating Relative Humidity | 5-95% (Non-condensed) |

DIMENSIONS

| | |
|-------------------------|---------------|
| Dimensions in mm(LXWXH) | 625X300X475MM |
| Weight in Kg | 55kgs |

NOTE: Specifications are subject to change without prior notice



GRID INTERACTIVE HYBRID INVERTER - 3PHASE



**Battery Less
Operation**

**2 Years
Warranty**

Grid Interactive Hybrid Solar Inverter - Three phase in-Three Phase out inverter gives maximum performance and reliability to run your heavy duty appliances. This inverter enables you to have the flexibility to be used as a On-Grid, Off-Grid or Hybrid Inverter as per your convenience

FEATURES

Redundant Power Supply (Grid & DG):

- Twin Power supply to improve the power availability for the operation of PCU



Graphical Display with Real-Time Operational Graph:

- Realtime SLD logic for easy understanding for the system operations.



NO Break Changeover:

- No time delay during changeover from Solar to Battery or Grid and vice-versa.



In-built safety for High Temp, Smoke and Reverse Polarity

- PCU will shut down in case of fire/smoke and protects the connected loads and the system.



Unbalanced Load Operation

- Prevents system trip during in the unbalancing load condition
- 100% Single phase, 50-50 unbalance, 33-33-33, equal balance



Minimized Internal Losses

- High performance and efficient controller
- Eliminate input current harmonics



GRID INTERACTIVE HYBRID INVERTER - 3PHASE

| Model Name | LS 310GIH | LS 312GIH | LS 315GIH | LS 320GIH | LS 325GIH | LS 330GIH |
|-------------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| INVERTER CAPACITY (kVA) | 10 | 12.5 | 15 | 20 | 25 | 30 |

GRID

| | |
|--------------------------------------|------------------------------------|
| Input Wiring | 3Ph five wire (3 PH + N + E) |
| Input Neutral Requirement | YES |
| Nominal Voltage | 330V to 450V FOR 3Ph |
| Grid Frequency Sync Range | 50 Hz (± 6%) |
| Unity power Factor for grid charging | Near to Unity |
| Operating condition | Continuous |
| Input Fault Level | >=10 kA |
| Self-Consumption | up to 4% |
| Charger Peak Efficiency | upto 95% |
| DG Compatibility | YES (Double of Inverter Capacity) |
| Grid Compatibility | YES SAME AS INVERTER CAPACITY |
| Grid Charger capacity | 50 % of KVA rating |

SOLAR

| | | | | | | |
|---------------------------|-----------|-----------|--|---|---|---|
| Charger Type | MPPT | | | | | |
| Max PV Connection in kWP | 11 | 13.8 | 16.5 | 22 | 27.5 | 33 |
| Max PV Voltage (VOC) | 300V | 300V | 300/500 V | 500V | 500V | 500/600V |
| MPPT Voltage Range (Vmp) | 165-250V | 165-250V | 165-250V for 120VDC / 300-450V for 240VDC | 300-450V for 240VDC / 450-600V for 360VDC | | |
| Max Input current (Isc) | 60 A | 75 A | 90 A for 120VDC and 50A for 240VDC | 66 A for 240VDC and 44 A for 360VDC | 83 A for 240VDC and 55 A for 360VDC | 100A for 240VDC and 66 A for 360VDC |
| String Combination @335Wp | S: 5 P: 6 | S: 6 P: 6 | S: 5 P: 9 (@120vdc) S: 9 P: 5 (@240vdc) | S:10 P: 6 (@240vdc) S: 12 P: 5 (@360vdc) | S: 9 P: 8 (@240vdc) S: 12 P: 6 (@360vdc) | S:10 P: 9 (@240vdc) S: 13 P: 7 (@360vdc) |
| No of MPPT Channel | 1 | | | | | |
| Panel Reverse Protection | Yes | | | | | |
| Solar Charger Efficiency | up to 95% | | | | | |

BATTERY

| | | | | | |
|----------------------------------|---------------------------------------|-----|---------|-----|---------|
| Nominal Battery Voltage (VDC) | 120 | 120 | 120/240 | 240 | 240/360 |
| Battery Buffer Setting | DC Voltage Selectable Through Key pad | | | | |
| Grid Charging Current | SETTABLE THROUGH Key PAD | | | | |
| Temperature Compensated Charging | YES | | | | |
| Battery Charging Voltage | Selectable from LCD Display | | | | |
| Type & No. of cells | Lead Acid / VRLA / Ni-Cd/ Lithium Ion | | | | |
| BMS compatible | YES | | | | |

OUTPUT

| | | | | | | |
|--------------------------------------|---|----|----|----|----|-----|
| Output Current (Amp) Total | 34 | 43 | 54 | 69 | 86 | 104 |
| Output Voltage (Inverter Mode) | 415V AC ± 2 % | | | | | |
| Output Frequency (Free Running) | 50 Hz ± 1% | | | | | |
| Output Waveform | Pure Sine wave | | | | | |
| Peak Inverter Efficiency (Full Load) | upto 90 % | | | | | |
| Total Harmonic Distortion | upto 3% at Linear Load | | | | | |
| Overload Capacity | 125% for 60Sec, 150% for 5 Sec | | | | | |
| Changeover Time (Full load) | No Break Change Over Time | | | | | |
| DC to AC Galvanic Isolation | In built Isolation Transformer at Inverter Output | | | | | |
| Anti Islanding Function | In Compliance with IEC 62116 | | | | | |
| Auto Bypass feature | YES | | | | | |
| Unbalance load handling capacity | YES | | | | | |

CONFIGURATION

| | |
|------------------------|-------------------------------------|
| Modes Available | Grid saving, Battery backup, Export |
| power Export to Grid | Enable / Disable option Available |
| power import from Grid | Enable / Disable option Available |

ENVIRONMENTAL

| | |
|-------------------------------|---|
| Acoustic Noise Level from 1 m | ≤ 65 dB |
| Operating Temperature | 0 to 40 Deg C(Dust free cooled and dry environment) |
| Storage Temperature | -10 Deg C to 60 Deg C |
| Relative Humidity | Up to 95 % (Non Condensing) |
| Altitude | < 1000 meter above sea level |
| Sysmic Requirement | upto 0.5g |

PHYSICAL

| | |
|----------------------------|------------|
| Enclosure Protection Grade | IP 20 |
| Cooling | Forced Air |
| Cable Entry | Bottom |

PARAMETERS DISPLAYED ON LCD

| | |
|----------------|--|
| Input Group | 1. Voltage, 2.Current, 3. Frequency, 4. kW, 5. kVA, 6. Import kWh , 7. Export kWh, 8. Power Factor |
| Inverter Group | 1. Voltage, 2. Current, 3. Frequency, 4. kVA |
| Output Group | 1. Voltage, 2. Frequency |
| Output Group | 1. Solar Voltage , 2. Solar Current, 3. Power(kW), 4. Solar Energy (kWh) |
| Battery Group | 1. Voltage, 2.Current 3. Charging Status |

PROTECTIONS

| | |
|------------------------|--------------------------|
| ELECTRICAL PROTECTIONS | CIRCUIT BREAKER and Fuse |
|------------------------|--------------------------|

ELECTRONIC PROTECTIONS

| | | |
|----------------|---|--|
| Alarms | Alarms are provided for all important protections. | |
| Inverter Group | 1.Input Under Voltage, 2.Input Over Voltage, 3. Charger Over Voltage, 4. Under /Over Frequency | |
| Inverter Group | 1. Output Under Voltage,2.Output Over Voltage 3. Overload, 4. Output short Circuit, 5. Inverter Over Tem-perature | |
| Solar Group | 1. Surge Protection , 2. Reverse PV Panel protection | |
| Battery Group | 1. Battery low , 2. Battery Over charge 3.,Battery Charging Current limit | |

CONNECTIVITY

| | | |
|--|--|---|
| Communication | RS 232 or RS 485 | |
| Protocol | MODBUS RTU | |
| LCD with backlight & Tactile Key pad Interface | YES | |
| Safety Factor | 1 for electronic devices, 1 for electrical | |
| Earthing Connection (Ref. IS-3043) | Earth terminal block | 25- 40 kVA : 3 x 25 mm GI (Earth bus bar running along the panel) |

PANEL COMBINATION

| | | | | | | |
|---------------------|---|------|-----|-----|-----|------|
| | Please discuss with Technical team for Battery less Panel combination | | | | | |
| Dimensions (in mm) | | | | | | |
| KVA Rating | 10 | 12.5 | 15 | 20 | 25 | 30 |
| Width (W) | 450 | 450 | 450 | 450 | 450 | 600 |
| Depth (D) | 800 | 800 | 800 | 800 | 950 | 1000 |
| Height (H) | 800 | 800 | 800 | 800 | 800 | 1300 |
| Weight (Kg) APPROX. | 150 | 150 | 150 | 300 | 350 | 600 |

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