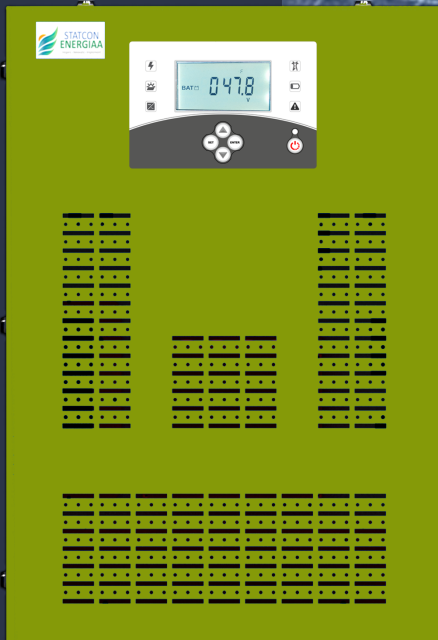




SEOG SERIES



Maximum utilisation of Solar Power



Less dependency on grid



5 modes of priority



Optional grid charging



Large LCD display



Optional two-way IoT access

1KVA/24V

1-8KVA/48V

5-8KVA/96V

5-12.5KVA/120V

15KVA/240V

MPPT-BASED PCU (SINGLE PHASE)

The Heavyduty Soldier of Solar Inverters

PRODUCT MANUAL

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Copyright Declaration

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1. NOTES ON THE MANUAL

1.1 SCOPE OF VALIDITY

This manual is an integral part of inverter, and it describe the assembly, installation, commissioning, maintenance and failure analysis/ troubleshooting of SEOG MPPT-Based PCU. List of inverters for which this operation manual is valid have been mentioned in the below list. This manual is not applicable for customized built ratings provided in writing by Statcon Energias Pvt. Ltd. (hence for the 'SEPL' or the company').





| Sr. No. | Model | Sr. No. | Model |
|---------|------------------|---------|------------------|
| 1 | SEOG-024-1K0-1P | 10 | SEOG-096-5K0-1P |
| 2 | SEOG-048-1K0-1P | 11 | SEOG-096-6K0-1P |
| 3 | SEOG-048-2K0-1P | 12 | SEOG-096-7K5-1P |
| 4 | SEOG-048-3K0-1P | 13 | SEOG-096-8K0-1P |
| 5 | SEOG-048-4K0-1P | 14 | SEOG-120-5K0-1P |
| 6 | SEOG-096-4K0-1P | 15 | SEOG-120-8K0-1P |
| 7 | SEOG-048-5K0-1P | 16 | SEOG-120-10K0-1P |
| 8 | SEOGT-048-6K0-1P | 17 | SEOG-120-12K5-1P |
| 9 | SEOG-048-8K0-1P | 18 | SEOG-240-15K0-1P |

NOTE : This manual may be applicable for other models as well on selective basis. In case your model of inverter is not mentioned in the above list, please contact manufacturer before using this manual.

Table 1

Keep this manual close to the machine where it is easily accessible for the operator / end-user.

1.2 SYMBOL INDICATIONS:

| | | | |
|---|---|--|--|
|  | WARNING! ELECTRICAL SHOCK HAZARD. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL. |  | DANGER ELECTRICAL HAZARD. TURN OFF POWER BEFORE SERVICING. |
|  | DANGER INDICATES A HAZARDOUS SITUATION WHICH, IF AVOIDED, WILL RESULT IN DEATH OR SERIOUS INJURY. |  | RISK OF FIRE |

1.3 SAFETY

1.3.1 GENERAL SAFETY RULES:

- ✓ Installation, maintenance & repair should be done by authorised, trained & experienced personnel only.
- ✓ Disconnect the battery, grid, solar panel & load before any service on the inverter to avoid electrocution.
- ✓ To disconnect the inverter, turn off the MCBs/Switch/Terminals on the PCU & remove the battery fuse holder.
- ✓ Use the PCU according to our instructions for operation.
- ✓ Metal bracelets, rings and other metal objects should be removed before touching the PCU to avoid contact with electricity carrying items.
- ✓ Dispose the battery through the Govt-approved agencies only, as it contains lead and other harmful chemicals.
- ✓ Ensure that the unit is out of reach of small children who may be exposed to serious injuries otherwise.
- ✓ Do not place inverter/ battery in the environment of heating vents, near the radiations or other source of heat.

1.3.2 PRECAUTIONS DURING INSTALLATION & REPAIR:

- ✓ Grounding of PCU & Panel should be done prior to connecting power.
- ✓ Before installation disconnect PV & Grid as they may start automatically under certain conditions.
- ✓ Baking powder neutralizes battery acid electrolyte. Always keep some handy.
- ✓ For disconnecting the battery first remove the negative terminal to avoid the spark.
- ✓ High voltage is present at the battery terminals even after the inverter is shut down.
- ✓ Before working on the unit always be assured the charge is discharged completely.
- ✓ Be careful while working with metal tools to avoid short circuit.

1.3.3 PRODUCT SAFEGUARDING:

PCU should be placed in accordance with the given instructions:

- ✓ Routine checks should be carried out to monitor the system health.
- ✓ Keep ventilation holes on the unit always open.
- ✓ The system works well in areas where temperature does not exceed the range between 0°C to 50°C.
- ✓ There should be no contact of the inside of the PCU with liquid of any kind as it may results in a shorting of the circuit.
- ✓ Dust free areas are preferred otherwise the performance may deteriorate over time resulting in a system failure, lightning, rain and adverse conditions.

1.3.4 PACKAGED CONTENTS:

- ✓ PCU
- ✓ Product Manual
- ✓ Spare Fuse (optional)



PCU



MANUAL



FUSE

Figure 1

2. INTRODUCTION

2.1 PRODUCT DESCRIPTION

The SEOG MPPT-Based PCUs are mechanically and electrically robust with a operating range and suitable for operating in harsh environments. This unit is perfectly fit for low-maintenance for industrial and residential applications both.

A typical block diagram is shown in Figure 2 involving the integration of SOLAR, GRID, BATTERY and GENSETS with the site loads. its inbuilt Intelligence manages all the sources selectively to provide seamless power to the loads so as to incur minimum bills with optimum utilization.

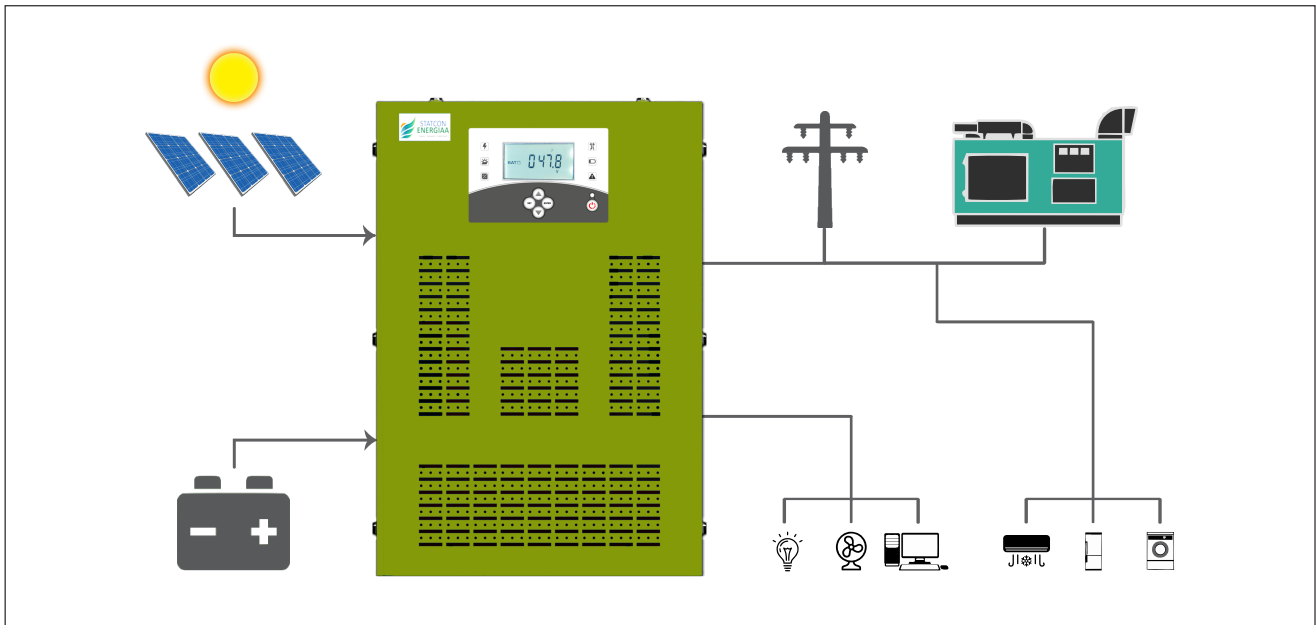


Figure 2

Congratulations on being a part of the Indian solar revolution and buying a product that helps in sustainable development, guarantees peace of mind and, more importantly, cuts a major portion of your electricity bill!

The solar Power Conditioning Unit (PCU) gives you the most savings through Solar PV + Battery + Mains.

Kindly visit www.energias.in to know more about our product range. Custom built ratings of inverter are also available on request and can be designed as per user requirements.

2.2 PRODUCT NOMENCLATURE

| | SE | OG | T | 1K00 | 1M00 | 48 | C01 | 0 |
|---------------------------------|--|----|---|------|------|----|-----|---|
| MANUFACTURER | | | | | | | | |
| SERIES | OG-OFF GRID | | | | | | | |
| MODEL TYPE | T- TOWER TYPE TT-TABLE TOP TYPE W-WALL MOUNTED TYPE F-FLOOR STAND TYPE | | | | | | | |
| VOLTAGE RATING KVA | 1K00 - 1KVA 6K25 - 6.25KVA | | | | | | | |
| MPPT RATING | 5M00 - 5KWp 1M00 - 1Kpw | | | | | | | |
| BATTERY RATING | 024 - 24 Volts 048 - 48 Volts 096 - 96 Volts | | | | | | | |
| COMMUNICATIONS | C01 - RS-232 C02 - GPRS C03 - DATA LOGGING C04 - GPRS + DATA LOGGING C05 - LAN EATHERNET | | | | | | | |
| VERSION OF PCU WITH DESCRIPTION | 0 - GLASS LCD DISPLAY LARGE 1 - 16 X 2 LCD 2 - PUMP APPLICATION WITH LARGE DISPLAY 3 - PUMP APPLICATION WITH 16 X 2 DISPLAY 4 - HV MPPT WITH BIG DISPLAY 5 - HV MPPT WITH SMALL DISPLAY 6 - POWER BOARD & CONTROL BOARD COMBINED | | | | | | | |

Figure 3

Note : Above nomenclature shall be valid only for SEOG MPPT-Based Power Conditioning Unit.

2.3 PHYSICAL APPEARANCE & TERMINATION DETAILS OF INVERTER

SEOG MPPT-Based PCU comes in sheet metal enclosure of standard sizes and colour shades depending upon the size of the machine. Any machine can be either Tower type or Table top type depending upon its capacity. All the units are for Indoor application only and should not be kept in open.

All the wire connections to unit are made from the bottom end at rear side. The terminology and sequence of terminals have been kept the same for as many models as possible for ease of understanding and has been explained below in detail.

The below chart brings out all the variants available in terms of dimensions and capacity of the machine.

| SR. NO. | RATING | DIMENSIONS (W X D X H) | ENCLOSURE TYPE | COLOUR SHADE | VIEWS |
|---------|----------------------------|------------------------|----------------|--------------|----------|
| 1 | 0.5-1 KVA Single Phase PCU | 450 X 360 X 200 | TABLE TYPE | GREEN/WHITE | Figure 4 |
| 2 | 2-4 KVA Single Phase PCU | 275 X 611 X 448.5 | TOWER TYPE | GREEN/WHITE | Figure 5 |
| 3 | 5-6 KVA Single Phase PCU | 400 X 753.5 X 650 | TOWER TYPE | GREEN/WHITE | Figure 6 |
| 4 | 5-8 KVA Single Phase PCU | 400 X 753.5 X 650 | TOWER TYPE | BLACK | Figure 7 |
| 5 | 10 KVA Single Phase PCU | 450 X 753.5 X 650 | TOWER TYPE | BLACK | Figure 7 |
| 6 | 15 KVA Single Phase PCU | 590 X 450 X 734 | TOWER TYPE | BLACK | Figure 8 |

Table 2

Note : Please note that the dimensions, enclosure type, colour shade and cable entry can be changed by the manufacturer without prior notice, owing to technological innovation.

2.3.1 SEOG - TABLE TOP TYPE MODEL : 0.5-1 KVA/24V/48V MPPT-Based PCU

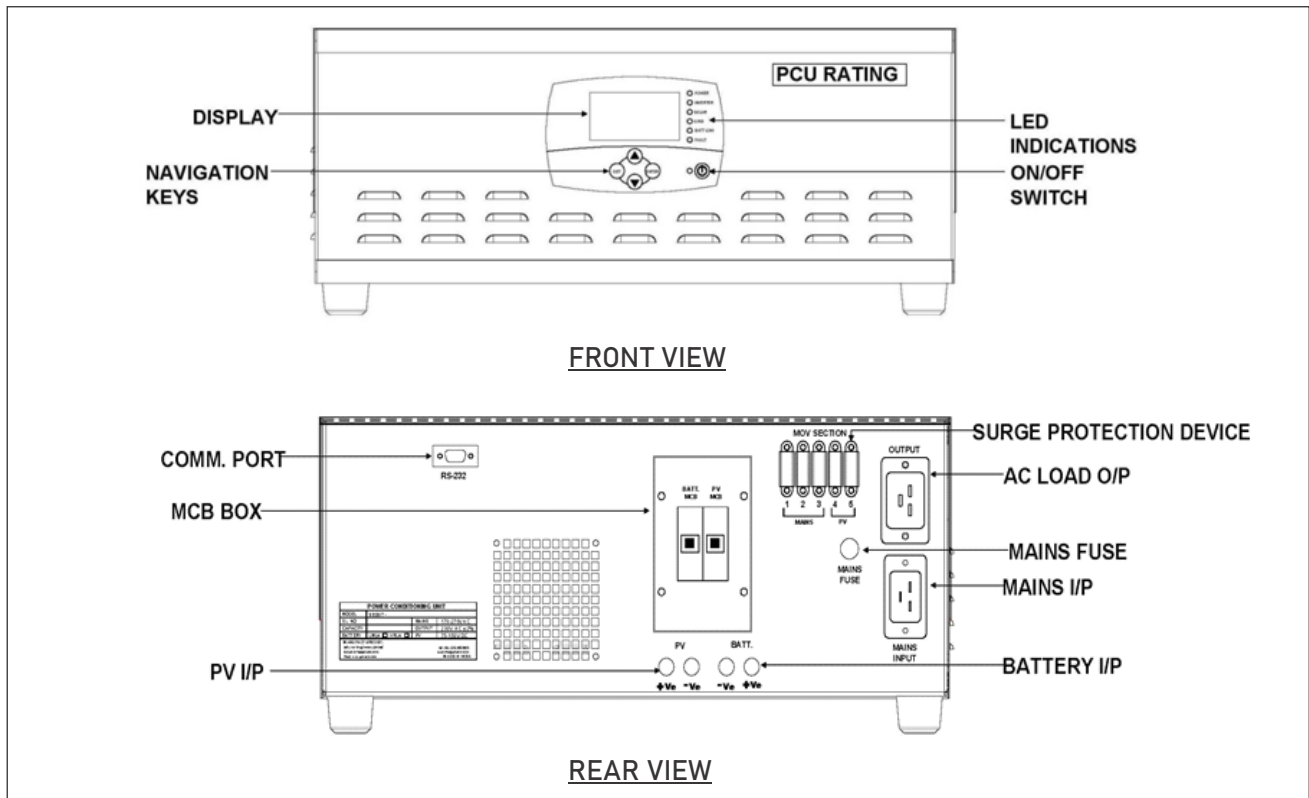


Figure 4

2.3.2 SEOG - TOWER TYPE MODEL : 2-4 KVA/48V MPPT-Based PCU

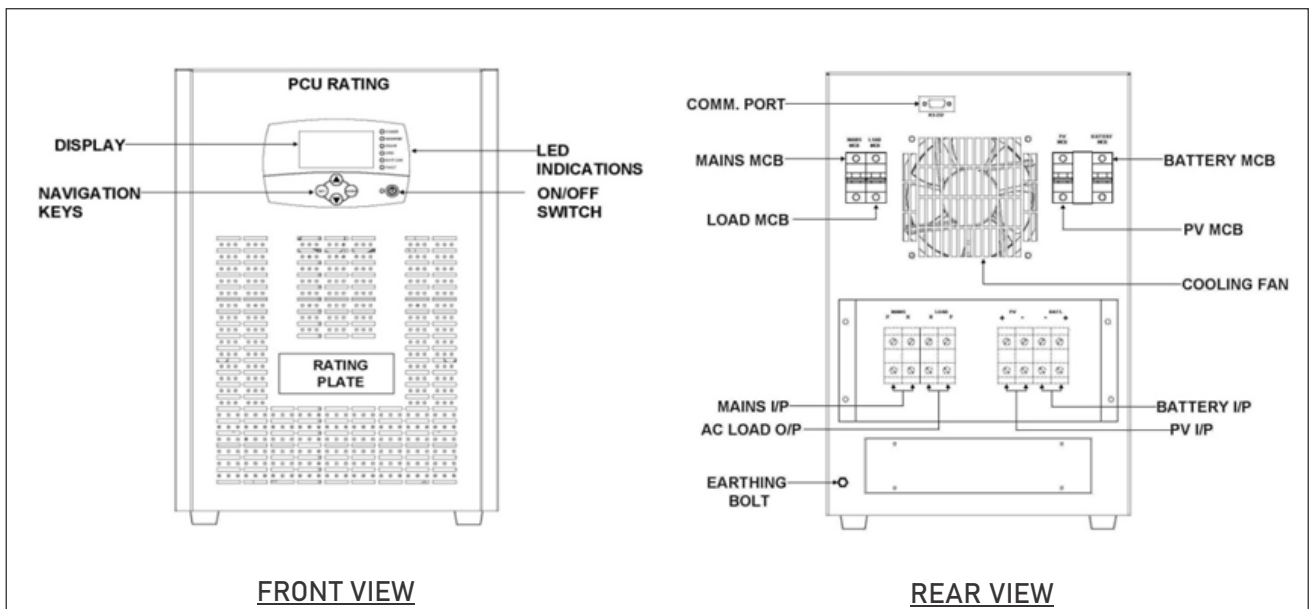


Figure 5

2.3.3 SEOG - TABLE TOP TYPE MODEL : 5-6 KVA/48V MPPT-Based PCU

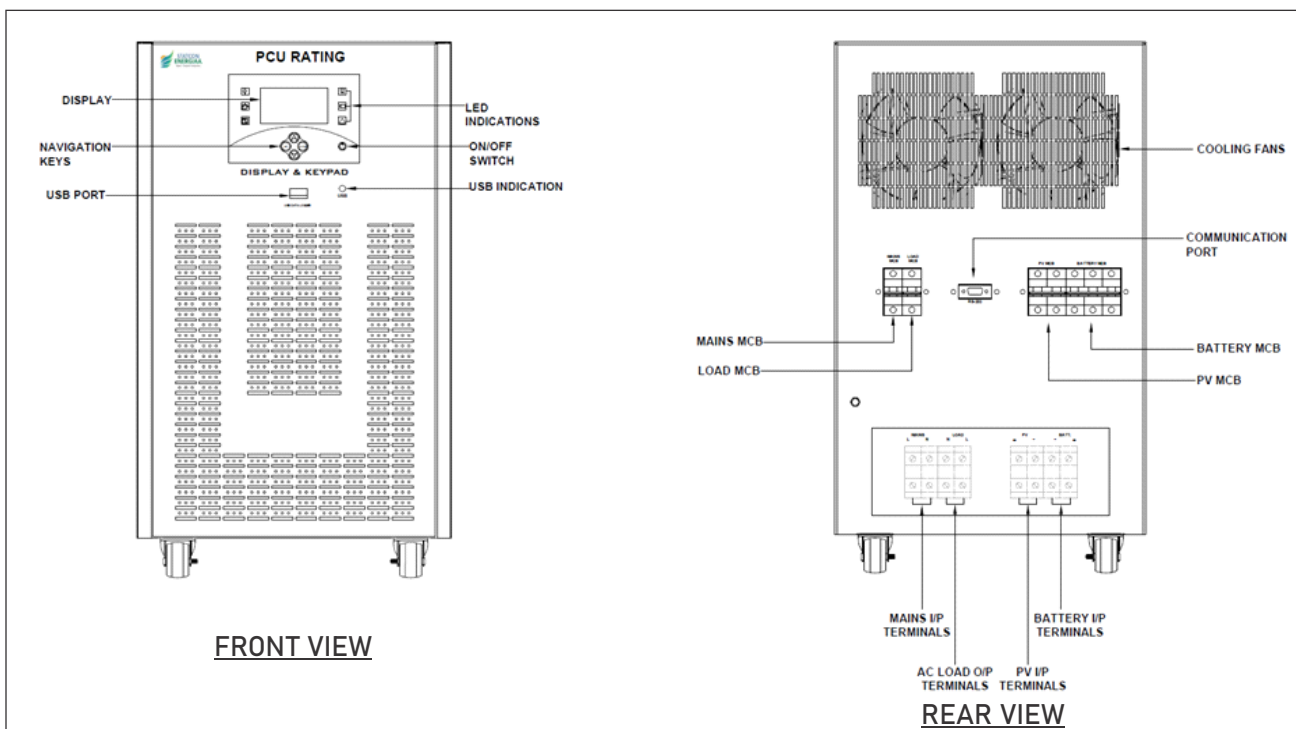


Figure 6

2.3.4 SEOG - TOWER TYPE MODEL : 10KVA/96/120V MPPT-Based PCU

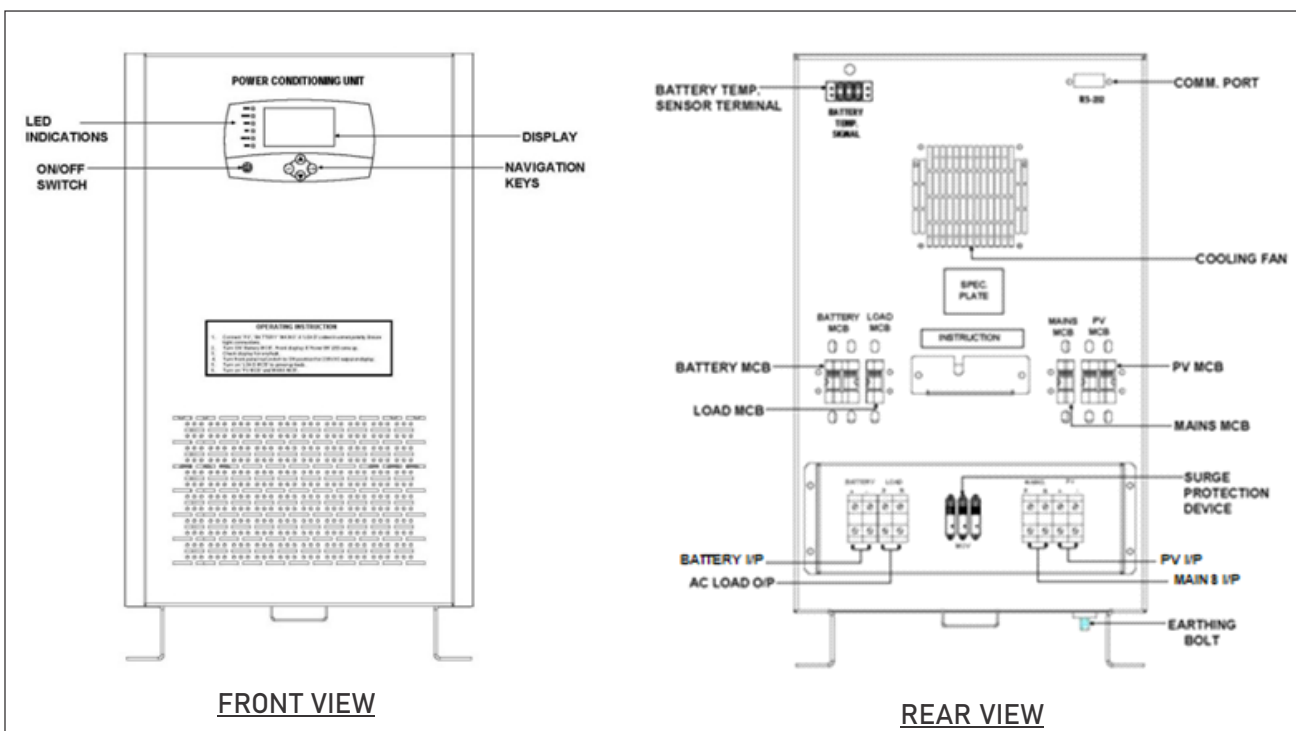


Figure 7

2.3.5 SEOG - TABLE TOP TYPE MODEL : 15KVA/240V MPPT-Based PCU

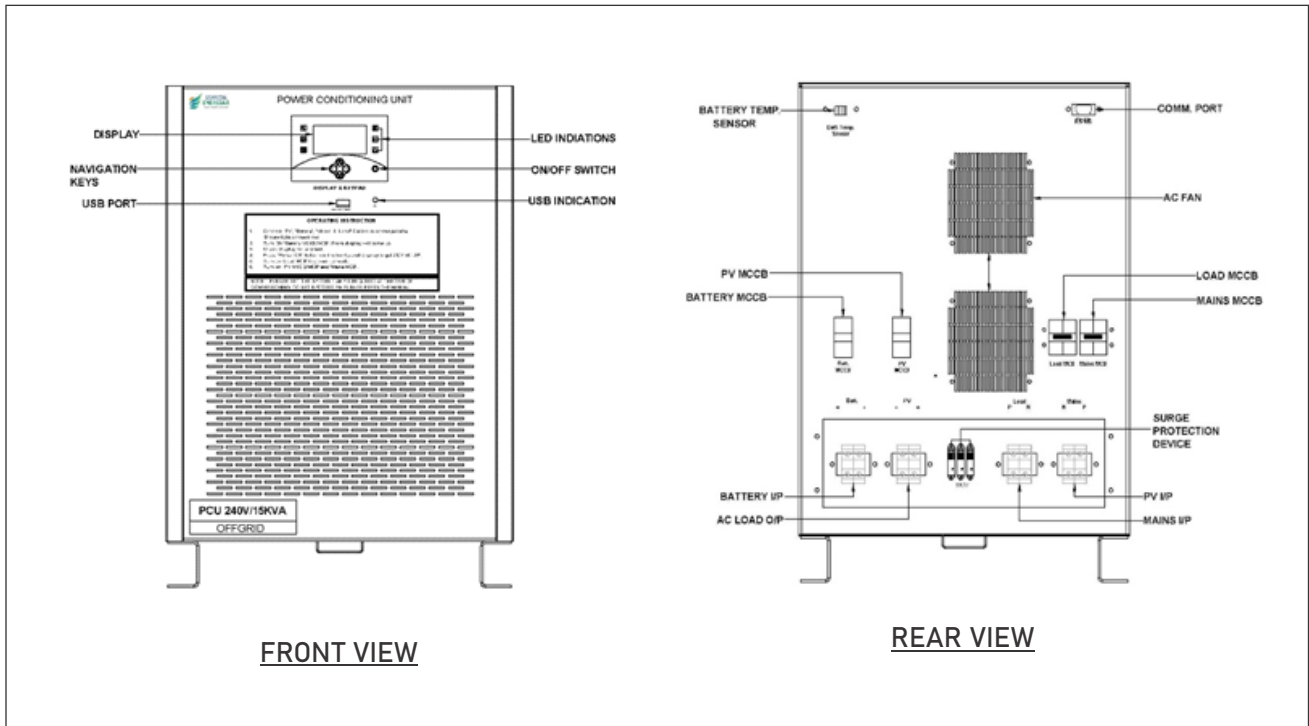


Figure 8

2.4 FEATURES

- SEOG series PCU's provide a complete solution for 230V AC, 50Hz power requirements. This series PCUs are rich in the following features:

2.4.1 5 MODE PRIORITY SELECTION AS PER USER REQUIREMENT

- ✓ MODE-1 : Solar > Grid > Battery*
- ✓ MODE-2 : Solar > Grid > Battery
- ✓ MODE-3 : Solar > Battery > Grid
- ✓ MODE-4 : Solar > Grid > Battery**
- ✓ MODE-5 : Grid > Solar > Battery

2.4.2 MONITORING

- ✓ Largest LCD display in its class for great visuals
- ✓ Inbuilt data logging capability up to 5 years (optional)
- ✓ RS 232/RS 485, GPRS, remote monitoring available (optional)

2.4.3 INDUSTRIAL GRADE INVERTER

- ✓ Designed for reliability against frequent grid variations
- ✓ Our Transformer provides galvanic isolation & has a long life
- ✓ Protective breakers at all inputs and outputs

2.4.4 PLUG IN PLAY

- ✓ Designed for screw-type/ pin type terminal blocks for all input and output
- ✓ Ideal for solar integrators due to ease of installation
- ✓ Designed for hassle free commissioning

Note: Refer the OPERATING MODES AND LOAD CHART for details (Table 5)-Page No.-19

3. INSTALLATION

3.0 LOCATION AND PLACEMENT

3.0.1 PCU

The Inverter should be placed in accordance with the following:

- ✓ Unpack PCU completely then unwrap the stretch film from PCU.
- ✓ In a well-ventilated room.
- ✓ Placed on a raised platform for better insulation from the ground, protection from water, and so on.
- ✓ Gas cylinders, spray and other inflammable items should not be placed near it.
- ✓ Should not be placed in direct sunlight, near running water or at excessively humid location.
- ✓ In case the system is not going to be installed immediately, it must be stored carefully in vertical position, as indicated on the packing and stored in a dry and sheltered room. Cover it with an envelope (paper/light material cover) so that it is protected from dust.
- ✓ If the inverter installation is over 6 months, be sure to charge batteries for at least 8 hours before the first use.

3.0.2 BATTERY

- ✓ Battery should be placed on a 3"(inch) ramp above from ground.
- ✓ Battery bank terminals should always be insulated to avoid and electrical shock.
- ✓ Batteries should preferably be placed in a separate room to avoid acidic fumes.
- ✓ Length of cable from battery to PCU should be kept to minimum to avoid the losses. Cable sizing should also be done keeping in mind to minimum the losses.

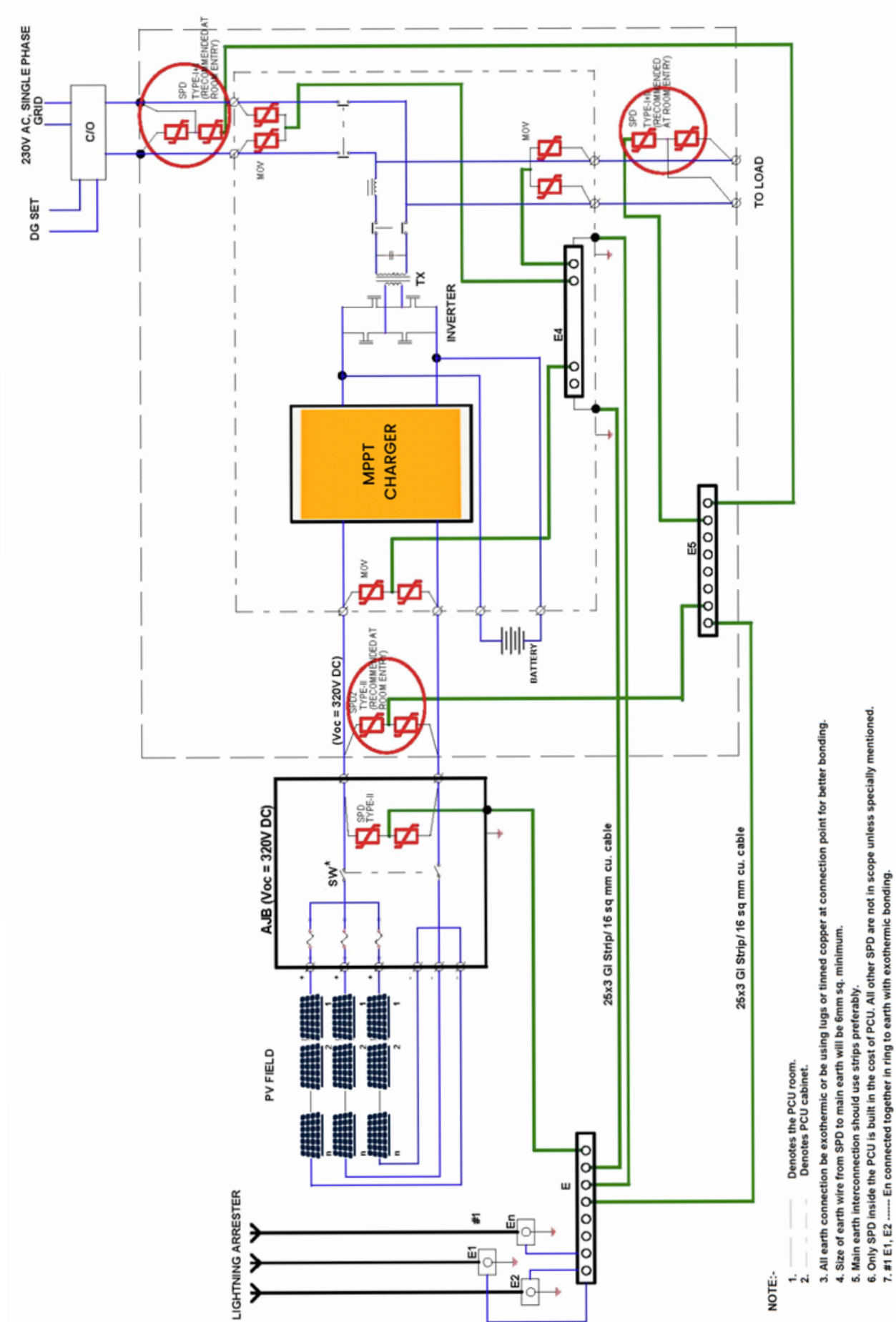
3.0.3 PV

- ✓ Place the solar panels (PV) in the direction of maximum duration time of sun.
- ✓ There should not be shadow of any object on the panel.
- ✓ Should be placed at sufficient height.
- ✓ Panel should be fixed properly.
- ✓ Since India is located in northern hemisphere so solar panel's face should true south direction.
- ✓ Solar panel tilt angle lies between 10°-30° but it should be determined according to the latitude of your position.

3.0.4 SURGE PROTECTION DEVICE (SPD)

- ✓ Surge Protection are a part of plant installations and hence, should be installed in addition to protection offered in PCU. Type and size surge protections vary from site to site and adequate consultation should be done with a subject matter expert before selection of SPD.
- ✓ Apart from SPD in AJB used for solar protection, additional SPD is recommended before PCU inside the room.
- ✓ Suitable SPD on AC side (both Grid and Load) is mandatory inside the room before PCU to avoid any damage to it caused by surges. A typical such schematic drawing can be seen in figure below for single phase PCU. An installer may contact some expert and use alternate scheme similar to this reliable working of PCU and site.

See the image below on next page:



This image shows a typical single-line diagram showing use of SPD and earth connection there of.

3.1 ELECTRICAL WIRING

WIRING AND THIMBLE/LUG SIZE CHART AS PER IS-3961-PART V

*THIMBLE/LUG DIA AT SCREW SIDE IS 6.2 MM. THIMBLE/LUG size should be same as wire size given below.

| Wire size (SQ. MM) Details | | | | |
|----------------------------|------------|-----------|---------|--------------|
| PCU Models | Mains Wire | Load Wire | PV Wire | Battery Wire |
| 24V/500VA | 1.5 | 1.5 | 2.5 | 6 |
| 24V/1kVA | 1.5 | 1.5 | 6 | 10 |
| 24V/1.5kVA | 2.5 | 1.5 | 10 | 16 |
| 48V/1kVA | 1.5 | 1.5 | 2.5 | 6 |
| 48V/2kVA | 2.5 | 1.5 | 6 | 10 |
| 48V/3kVA | 4 | 2.5 | 10 | 16 |
| 48V/4kVA | 6 | 2.5 | 16 | 25 |
| 48V/5kVA | 6 | 4 | 16 | 25 |
| 48V/6kVA | 10 | 6 | 25 | 35 |
| 96V/4kVA | 10 | 2.5 | 6 | 10 |
| 96V/5kVA | 10 | 4 | 10 | 16 |
| 96V/6kVA | 10 | 4 | 10 | 16 |
| 96V/7.5kVA | 10 | 6 | 16 | 25 |
| 96V/8kVA | 10 | 6 | 16 | 25 |
| 120V/4kVA | 6 | 2.5 | 6 | 10 |
| 120V/5kVA | 10 | 4 | 10 | 16 |
| 120V/6kVA | 10 | 4 | 10 | 16 |
| 120V/7.5kVA | 16 | 6 | 16 | 25 |
| 120V/8kVA | 16 | 6 | 16 | 25 |
| 120V/10kVA | 25 | 10 | 25 | 35 |
| 240V/15kVA | 25 | 16 | 16 | 16 |

Table 3

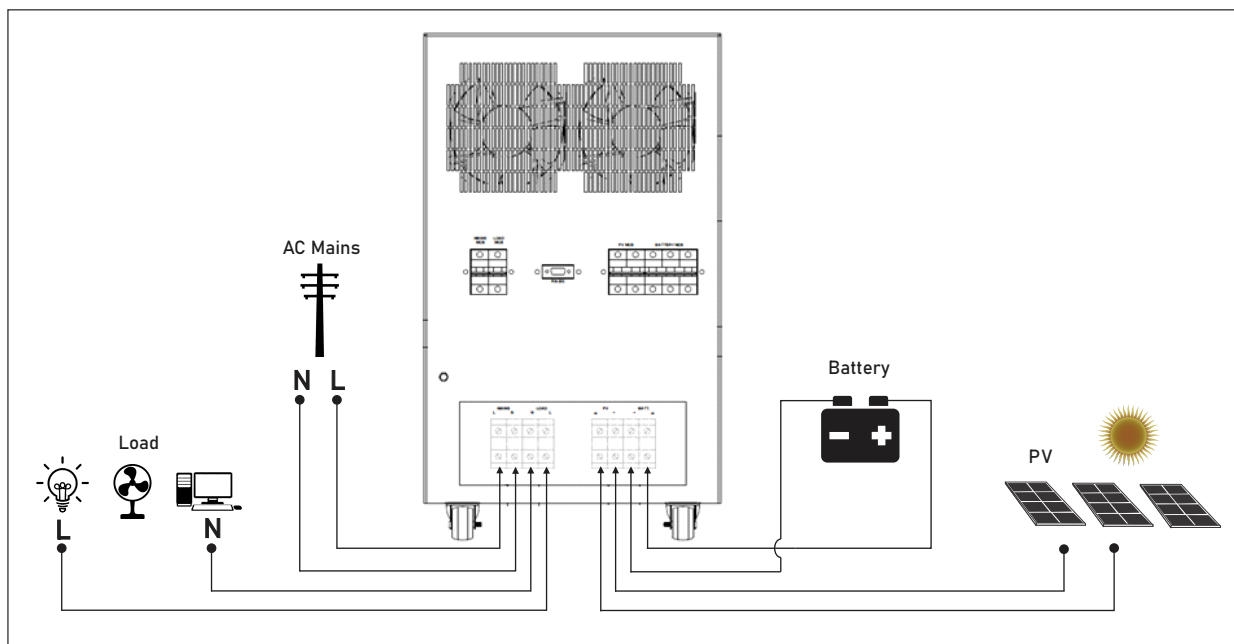


Figure 9



ENSURE THAT ALL THE MCB's ARE IN OFF POSITION BEFORE STARTING THE CONNECTION.

3.2 ELECTRICAL CONNECTIONS

3.2.1 CONNECTION TO THE BATTERY

- ✓ Connect the +ve terminal of the battery to the 'BATT+' terminal of PCU.
- ✓ Connect the -ve terminal of the battery to the 'BATT-' terminal of PCU.
- ✓ Keep wire to be of minimum possible length.
- ✓ Follow the wire size and lug details as per given in Table 3.



BEFORE CONNECTING BATTERY WIRES MAKE SURE THAT ALL MCB's ARE IN OFF POSITION.

3.2.2 CONNECTION TO AC SUPPLY IN

- ✓ Use a 2-core cable for connection of load to PCU.
- ✓ The AC Mains must be connected to the screw/plug type terminals of AC Mains of PCU.
- ✓ Connect the Phase wire of the AC Mains to the 'L' terminal of PCU.
- ✓ Connect the Neutral wire of the AC Mains to the 'N' terminal of PCU.
- ✓ Follow the wire size and lug details as per given in Table 3.

3.2.3 CONNECTION OF SOLAR MODULES (PV) : SOLAR IN

- ✓ The PV output must be connected to the 'PV' screw terminals of PCU.
- ✓ Connect the +ve terminal of the PV output to the 'PV+' terminal of PCU.
- ✓ Connect the -ve terminal of the PV output to the 'PV-' terminal of PCU.
- ✓ Follow the wire size and lug details as per given in Table 3.

3.2.4 CONNECTION OF LOAD : LOAD OUT

- ✓ Use a 2-core cable for connection of load to PCU.
- ✓ The AC load must be connected to Load terminals of PCU.
- ✓ Connect the Phase wire of the Load to the 'L' terminal of PCU.
- ✓ Connect the Neutral wire of the Load to the 'N' terminal of PCU.
- ✓ Follow the wire size and lug details as per given in Table 3.

3.3 INSTRUCTION TO FOLLOW

- ✓ Charge the batteries before first use.
- ✓ MCBs on the inverter should be OFF during connecting wires to the PCU.
- ✓ Use thimbles for proper connection of wire at screw terminals

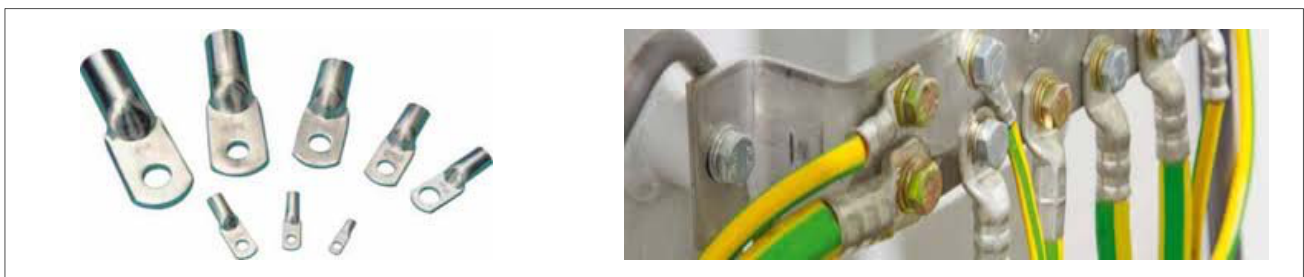


Figure 10

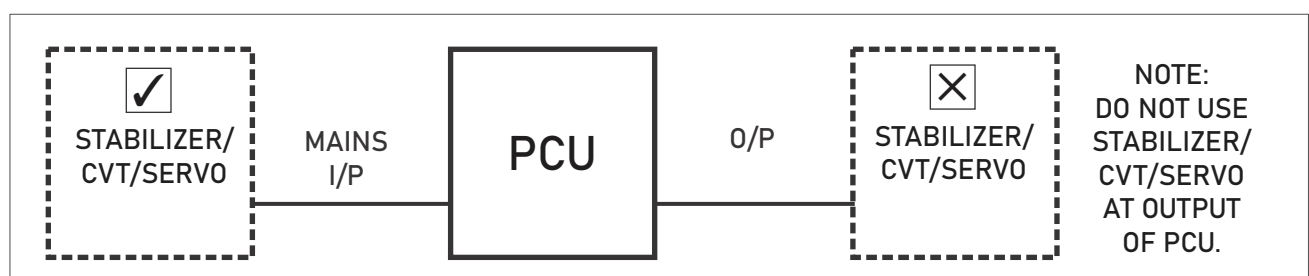


Figure 11

3.4 EARTHING

- ✓ Earthing of any equipment is required to ensure that the chassis of the equipment is at ground potential and the user does not experience any shock in case of contact.
- ✓ For SPDs to operate and protect the equipment against lightning, earthing is mandatory.
- ✓ Quality of earthing and related values are important for adequate protection and vary from site to site, and equipment to equipment.
- ✓ Earthing kit contains rod and clay-salt mixture.
- ✓ For earthing, dig a 4-5 feet hole in ground and put the rod with mixture and water.
- ✓ Connect the earth wire from house to clamp.
- ✓ It is advisable to have a proper earthing near your house or solare panels.
- ✓ Please ensure that earth connection of SPD as per section 3.0.4 above is as drawing.

3.5 STARTING UP THE PCU

- Check all the connections twice before starting the PCU.
- Ensure that:
 - Battery terminals (+ve to +ve & -ve to -ve) are connected tightly and properly.
 - Load is connected properly.
 - AC Mains is connected properly.
 - PV is connected properly.
 - Check the polarity correct.
- After checking all the connections, Switch on the Battery MCB first.
- After switching on the MCB, the display is switched ON.
- Now switch ON all the MCB's : AC Mains MCB, Load MCB and PV MCB.
- Now press the power button given below the display for a few seconds till the green LED comes ON.
- Your PCU will start now.

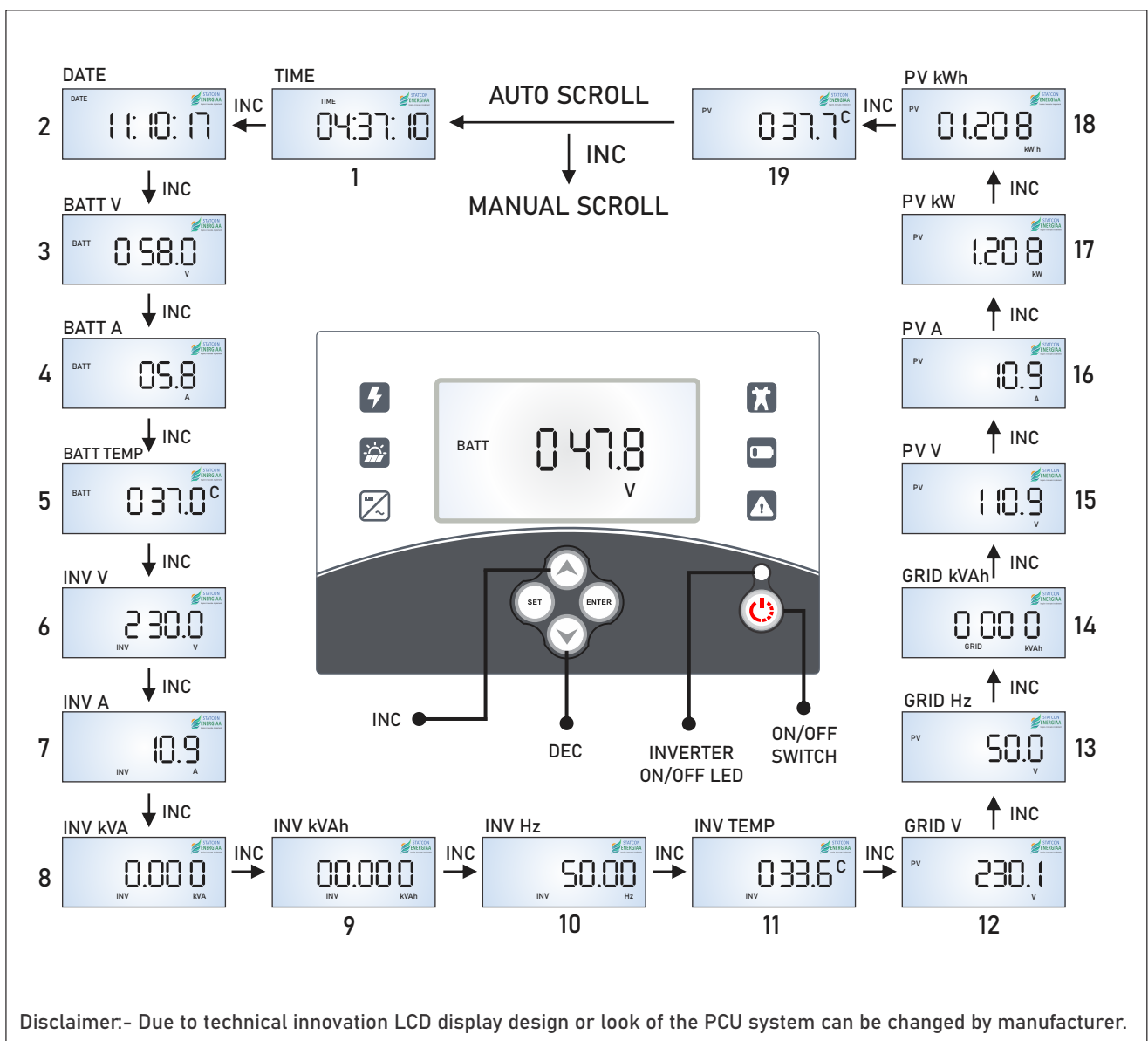
4. DISPLAY

4.0 DISPLAY OVERVIEW

- ✓ The Flow diagram of home display on the page shows the basis navigation of the display panel through the buttons provided : namely INC, DEC, SET, ENTER.
- ✓ The display automatically scrolls the parameters after the unit is switched ON.
- ✓ Various parameters are displayed one after the other with a 5 second time period for each and 10 second delay for TIME and DATE.
- ✓ Press "INC" key to see each parameter manually and now each parameter can be scrolled through one by one by pressing INC key successively.

4.1 DISPLAY PARAMETERS

- ❖ BATTERY : Voltage, Charging Current, Discharging Current, Temperature
- ❖ PV : PV Voltage, PV Current, PV Power, PV Today's kWh.
- ❖ INVERTER : Voltage Current, Frequency, Load kVA.
- ❖ GRID : Voltage, Frequency, Grid kVAh.
- ❖ Date, Time.



Disclaimer:- Due to technical innovation LCD display design or look of the PCU system can be changed by manufacturer.

Figure 12

4.3 MENU SETTING

- ✓ Long Press key SET to enter MENU setting Mode.
- ✓ In MENU press key INC successively to go in DATA LOGGING MODE, USER MODE, USER SETTING MODE, FACTORY SETTING MODE and PARAMETER CALIBRATION MODE. To exit from this mode press ENTER.

4.3.1 DATA LOGGING MODE

- ✓ Press key SET to enter in data mode when displayed on scree.
- ✓ Press key SET to see days unit generation (KWh) day wise data.
- ✓ Press key SET to see monthly unit generation (Kwh) data.
- ✓ Press key SET to see year wise (Kwh) data.
- ✓ Press key ENTER to exit this mode.

4.3.2 USER SETTING MODE

- ✓ Press key SET to enter in user mode when displayed on screen.
- ✓ After entering in user mode it will show software versions.
- ✓ PC-UEr (XX.X) and dp-UEr (X.X)
- ✓ After this, it will show rating of your PCU. e.g. 48-4 kVA.
- ✓ Press key INC to select your battery type (LM/VRLA/NI-CAD). Now press key SET to select battery capacity (Ah).
- ✓ Using INC/DEC keys, we can change battery capacity. Now press SET key to choose priority mode now.
- ✓ Press key INC/DEC to choose your source priority mode (S>G>B*/S>G>B/G>B>G/S>G>B**/G>S>B).
- ✓ Press key ENTER to save your settings. It will automatically return to main menu.

4.3.3 FACTORY SETTINGS MODE

- ✓ This mode is password protected. (to be operated only by trained personnel of company).

4.3.4 PARAMETER CALIBRATION MODE

- ✓ This mode is password protected. (to be operated only by trained personnel of company).

4.4 LED INDICATION

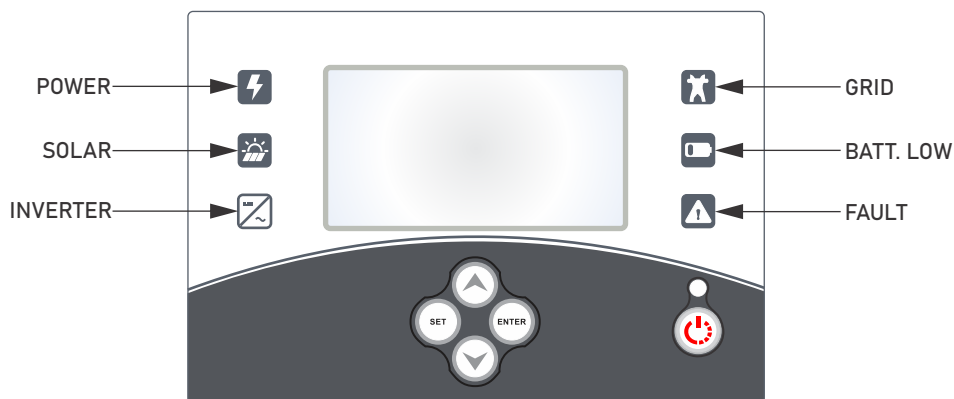


Figure 13

- ❖ POWER : This green LED indicates PCU's control circuitry is power ON.
- ❖ INVERTER ON : This yellow LED glows when AC load is on INVERTER.
- ❖ SOLAR ON : This yellow LED glows in steady state - this tells that the solar present and the charging is completed/stoped. When blinking, it tells the solar is present and the charging is in process
- ❖ GRID ON : This yellow LED glows in steady state - this tells that grid is present and the load are bypassed on GRID supply. When blinking with 1 second interval, it tells that (i)the grid is present, (ii) the grid charging is in process and , (iii) the load is running on GRID supply. When blinking with a 5 second interval, it means that the GRID supply is available and the loads are running on PV+Battery.

- ❖ **BATT LOW** : This red LED glow when your battery is low/discharged. Once Battery voltage falls below Battery Under Voltage set value; Inverter will shut down and disconnect the load to stop further discharging of battery. Next, "BATT. LOW" indication will appear on the display. Now Inverter will again given the O/P to load only when Battery Voltage rises up to more than float voltage set value.
- ❖ **FAULT** : This red LED glow if any Fault occurs.
- ❖ **INV ON/OFF** : Press and hold button to turn on your PCU, green LED nearby button will start glowing, which indicates inverter is switched ON.



PRESS AND HOLD BUTTON TO TURN ON YOUR PCU, GREEN LED NEARBY BUTTON WILL START GLOWING, WHICH INDICATES INVERTER IS SWITCHED ON.



LED OF CHARGING SOURCE WILL KEEP BLINKING DURING CHARGING.

4.5 MENU SETTING FLOW CHART

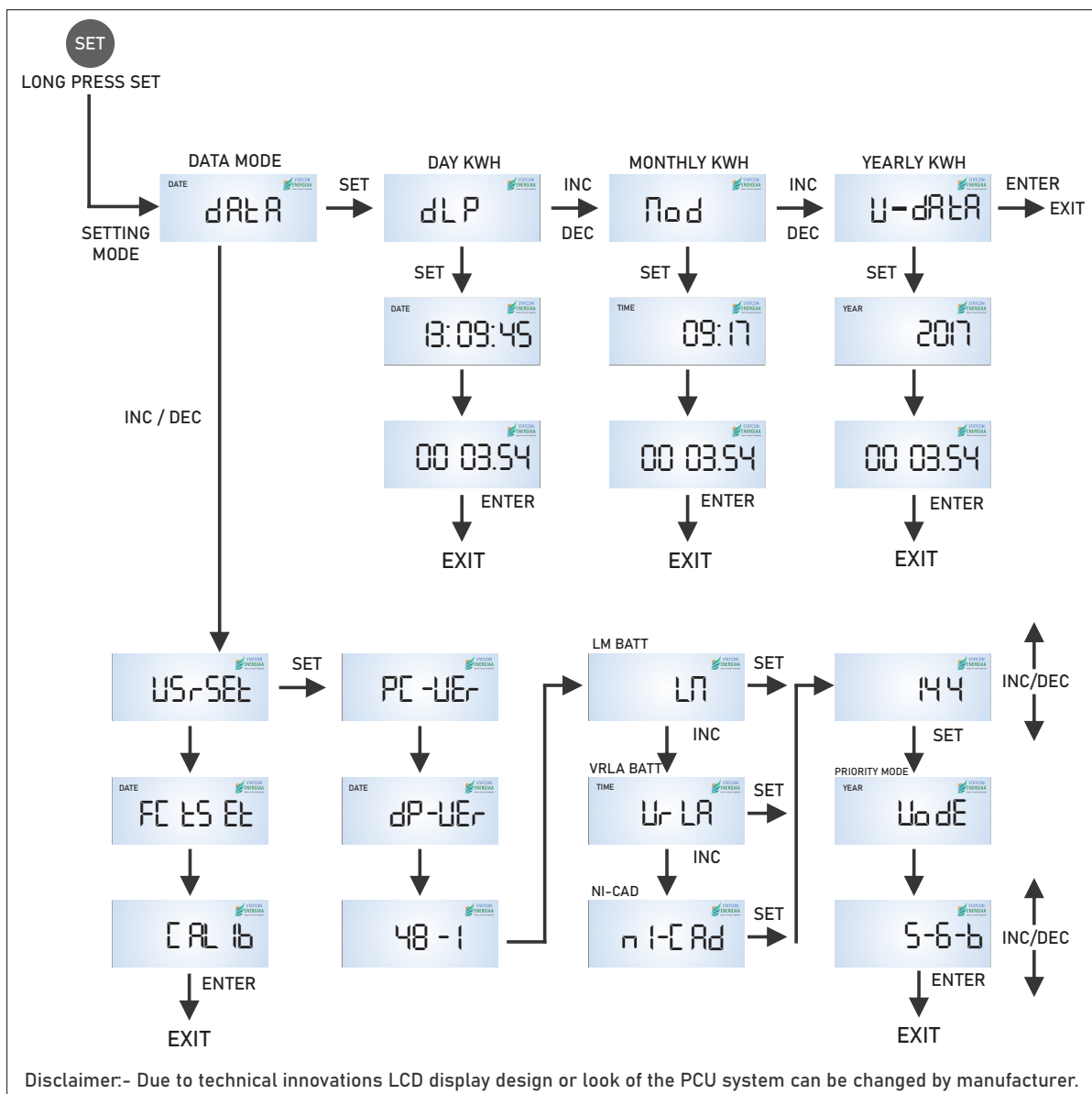


Figure 14



IN USER SETTING MODE BATTERY TYPE, BATTERY CAPACITY & PRIORITY MODE MUST BE CHOSEN PROPERLY AS PER YOUR REQUIREMENT.

4.6 FAULT ANALYSIS

4.6.1 FAULT / ALARM INDICATION VIA BUZZER

In the PCU system, if any fault/alarm occurs then an audio alarm indication is generated by a buzzer -a continuous beep sound. By pressing ENTER key after checking the fault type in LED/LCD, buzzer sound gets deactivated.

4.6.2 FAULT DISPLAY

If any fault occurs in the PCU system, predefined fault no. start display in upper right side of the LCD display with the FAULT*--- as a prefix with each fault number. The lists of fault name are given in the Table 4 as per their respective fault number/codes.

| FAULT INTERPRETATION | FAULT CODE IN DISPLAY |
|---------------------------------|-----------------------|
| SYSTEM TRIP | FAULT * 0 |
| INVERTER UNDER VOLTAGE | FAULT * 1 |
| INVERTER OVER VOLTGE | FAULT * 2 |
| BATTERY UNDER VOLTAGE | FAULT * 3 |
| BATTERY OVER VOLTAGE | FAULT * 4 |
| SYSTEM OVER TEMPERATURE | FAULT * 5 |
| BATTERY TEMP. COMPENSATION FAIL | FAULT * 6 |
| SOLAR CHARGE OVERLOAD | FAULT * 7 |
| SOLAR OVER VOLTAGE | FAULT * 8 |
| INVERTER O/P OVER LOAD | FAULT * 9 |
| BATTERY UNDER VOLTAGE ALARM | FAULT * a |
| MAINS UNDER FREQUENCY | FAULT * b |
| MAINS OVER FREQUENCY | FAULT * c |
| SYSTEM O/P SHORT CIRCUIT | FAULT* d |

Table 4

5. OPERATING MODES AND LOAD CHART

5.1 DETAILS OF PRIORITY MODES

| MODES | MEANING | REASON TO SELECT THIS MODE |
|---------------------|---------|---|
| MODE-1 | S>G>B* | Suitable for the case where customers wants no battery charging through grid supply. This mode allows the battery to discharge approx. 40%-50% then AC loads switch to grid source, if grid supply available. |
| MODE-2 (default) | S>G>B | This mode allows the battery to discharge approx. 40%-50% then A C loads switch to grid source, if grid supply available. This mode allows the battery charging through grid when battery discharge more than 80% |
| MODE-3 | S>B>G | This mode allows the battery to discharge aprox. 60%-70% then AC loads switch to grid source, if grid supply available. This mode allows the battery charging through grid when battery discharge more than 80%. |
| MODE-4 | S>G>B** | Suitable for areas where grid supply is available only for 6-8 hours in a day. So, whenever grid available it charges the battery up-to approx. 80% of its capacity to make sure to get more battery backup in night time as compared to above 3 modes. |
| MODE-5 | G>S>B | Suitable for areas when sufficient solar power is not available for long duration (i.e. in rainy days or where solar panel non available due to some reason). By selecting this mode PCU will run like conventional home inverter. |

Table 5

Note: Above stated battery's SOC in percentage is estimated (based on Battery Voltage only) but not actual. This holds true for all percentage mentioned in the table above.

5.2 WORKING OF SYSTEM

EXPLAINED FOR MODE-2 : SOLAR > GRID > BATTERY

























| SOLAR SOURCE | GRID | BATTERY VOLTAGE | AC LOAD ON | BATTERY STATUS |
|----------------------------------|------|--|---|---|
| ✓ PV POWER < AC LOAD POWER | ✓ | <= NOMINAL VOLTAGE |  +  |   |
| ✓ PV POWER > AC LOAD POWER | ✓ | > NOMINAL VOLTAGE |  |   |
| ✓ PV POWER > AC LOAD POWER | ✗ | > NOMINAL VOLTAGE |  |   |
| ✓ PV POWER < AC LOAD POWER | ✗ | <= NOMINAL VOLTAGE |  +  |   |
| ✗ | ✓ | > NOMINAL VOLTAGE |  |   |
| ✗ | ✓ | < NOMINAL VOLTAGE |  | NEITHER CHARGE NOT DISCHARGE |
| ✗ | ✓ | < NOMINAL VOLTAGE (DISCHARGED UPTO 70%) |  |   |
| ✗ | ✗ | < NOMINAL VOLTAGE |  |   |
| ✗ | ✗ | < NOMINAL VOLTAGE (DISCHARGED UPTO 100%) | OFF | NEITHER CHARGE NOR DISCHARGE |

Table 6



HERE NOMINAL VOLTAGE OF BATTERY COULD BE OF 24V/48V/96V/120V ETC.

5.3 LOAD CHART & BATTERY SIZING

PCU must be chosen as per load requirement, as this affects the life of your battery as well as the PCU. Manufacturer shall not be responsible for the selection of mode as well as the size of the PCU (that can only be determined by the installer/end-user).








| PCU Rating → | 24V-1KVA | | 48V-3KVA | | 96V-4KVA | | 96V-6KVA | |
|---|-----------------------------------|-------------|------------------------------------|-------------|-----------------------------------|-------------|------------------------------------|-------------|
| *LOADS ↓ | QTY | TOTAL WATSS | QTY | TOTAL WATTS | QTY | TOTAL WATTS | QTY | TOTAL WATTS |
|  15W | 3 | 45 | 6 | 90 | 12 | 180 | 15 | 225 |
|  40W | 1 | 40 | 3 | 120 | 6 | 240 | 10 | 400 |
|  60W | 2 | 120 | 4 | 240 | 8 | 480 | 12 | 720 |
|  150W | 1 | 150 | 2 | 300 | 3 | 450 | 4 | 600 |
|  250W | 1 | 250 | 1 | 250 | 1 | 250 | 2 | 500 |
|  350W | — | — | 1 | 350 | 1 | 350 | 2 | 700 |
|  450W | — | — | 1 | 450 | 1 | 450 | 1 | 450 |
| TOTAL | | 605W | | 1800W | | 2400W | | 3595W |
| BATTERY SIZING | 12V X 2 = 24V 70Ah X 2 = 140Ah | | 12V X 4 = 48V 100Ah X 4 = 400Ah | | 12V X 8 = 96V 70Ah X 8 = 560Ah | | 12V X 8 = 96V 100Ah X 8 = 800Ah | |

Table 7

*These ratings are based on assumption of load rating, battery rating and consumption of power by battery for charging & operation of load for 1 hours.

6. MAINTENANCE & TROUBLESHOOTING

6.1 VISUAL INSPECTION

- Inspect the inverter and the cables for visible damage and pay attention to the operating status display of the inverter.
- Before maintenance, you must disconnect AC and DC to avoid risk any shock.
- In case of any damage, notify your installer. Repair may only be carried out by authorised electricians.



PLEASE CARRY OUT VISUAL INSPECTION AT LEAST ONCE OR TWICE A YEAR.

6.1.1 CLEANING THE INVERTER EXTERNALLY

- Only use completely dry cloth/tissue to clean the inverter.
- Only the exterior of the inverter should be cleaned.
- Use a soft and dry brush to remove dust from the fan cover and from the top side of the inverter on a regular basis.



LETHAL VOLTAGES ARE STILL PRESENT IN THE TERMINALS AND CABLES OF THE INVERTER EVEN AFTER THE INVERTER HAS BEEN SWITCHED OFF AND DISCONNECTED.

6.1.2 BATTERY MAINTENANCE

- Batteries should not be discharged more than 50% of their capacity on a regular basis. Under extreme conditions (such as a severe storm or a long utility outage), cycling to a discharge level of 80% is acceptable.
- Totally discharging a battery may result in permanent damage and reduced life. Our PCUs limit the depth of discharge to 60% to prolong the life of the batteries and save on your battery costs in the long run.

6.1.3 PV MAINTENANCE

- PV Panel surface should be clean.
- PV Panel should be replaced in case of any damage of upper layer (Non reflective layer).
- PV Panel should be checked regularly to ensure that it is receiving maximum sunlight possible.

6.2 TROUBLESHOOTING



PRESS KEY ENTER WHILE IN NORMAL PARAMETER DISPLAY TO SEE THE FAULT INDICATION IN PCU.

- **FAULT * 0 (SYSTEM TRIP)** : This fault may occur due to different reasons of accompanied fault or may be due to internal issues in PCU.

REMEDY:

- ✓ Check the other faults indicated with **FAULT * 0** and refer their remedies. Immediate consultation with a service expert is required.



IN CASE OF ANY OTHER REASON CONTACT TO SERVICE ENGINEER.

- **FAULT * 1 (INVERTER OUTPUT UNDER VOLTAGE/INVERTER OUTPUT BAD)** : This fault may occur due to improper output of inverter or due to loose connections.

REMEDY:

- ✓ Check all connections of your PCU.



IN CASE OF ANY OTHER REASON CONTACT TO SERVICE ENGINEER.

- **FAULT * 2 (INVERTER OVER-VOLTAGE):** This fault occurs due to internal fault of PCU or due to loose connections.

REMEDY:

- ✓ Check all connections of your PCU.



IN CASE THESE DO NOT WORK, CONTACT THE SERVICE ENGINEER.

- **FAULT * 3 (BATTERY UNDER-VOLTAGE) :** This fault/alarm may occur due to loose connection of your battery or due to deep discharging of battery. The other reason of this fault may be due to issues related battery.

REMEDY:

- ✓ Check the connections of your battery.
- ✓ Check the settings of your PCU in USER mode.
- ✓ Check the battery voltage.
- ✓ Check the battery if required.



IN CASE THESE DO NOT WORK, CONTACT THE SERVICE ENGINEER.

- **FAULT * 4 (BATTERY OVER-VOLTAGE) :** This fault may occur due to the battery voltage exceeding your PCU rating.

REMEDY:

- ✓ Choose the battery as per your inverter rating and load.



IN CASE OF ANY OTHER REASON CONTACT TO SERVICE ENGINEER.

- **FAULT * 5 (SYSTEM OVER-TEMPERATURE) :** This fault occurs due to overheating of PCU than its nominal range. It may be due to fan failure or improper ventilation of room & the PCU.

REMEDY:

- ✓ Check the fans of your PCU.
- ✓ Check the location of PCU to suitable environment.
- ✓ Check the ventilation holes of PCU. They should not be blocked.



IN CASE OF ANY PERSISTENT ISSUE, CONTACT THE SERVICE ENGINEER.

- **FAULT * 6 (TCS_FAIL) :** Contact to service engineer.

- **FAULT * 7 (SOLAR OVERLOAD) :** This fault may occur due to exceeding the load from nominal range of your PCU or due to connecting the PV Panel of lower rating from the suggested rating of your PCU.

REMEDY:

- ✓ Check the PV rating.
- ✓ Check of load is exceeding the limit of PCU.
- ✓ Check the battery Ah setting in user mode. (It must be as your battery specification).



IN CASE OF ANY OTHER ISSUE CONTACT TO SERVICE ENGINEER.

- **FAULT * 8 (SOLAR OVER VOLTAGE) :** This fault may occur due to exceeding the PV output from nominal range of your PCU.

REMEDY:

- ✓ Check the PV output (It must be as per your PCU specification).



IN CASE OF ANY OTHER ISSUE, CONTACT TO SERVICE ENGINEER.

- FAULT * 9 (SYSTEM OVER LOAD) : This fault may occur due to exceeding the load from PCU rating.

REMEDY:

- ✓ Check the total load your are connecting to your PCU. (It should not exceed the nominal limit of PCU).



IN CASE OF ANY OTHER ISSUE, CONTACT TO SERVICE ENGINEER.

- FAULT * A (BATT_UNDER_VOLTAGE_ALARM) : This fult/alarm may occur due to low voltage. (It may be due to discharging of battery or battery damage. It may occur due to loose connection of battery terminals.

REMEDY:

- ✓ Check the battery voltage and battery connections.



IN CASE OF ANY OTHER ISSUE, CONTACT TO SERVICE ENGINEER.

- FAULT * B (MAINS UNDER FREQUENCY) : This fault may occur due to improper frequency of mains.

REMEDY:

- ✓ Check the mains supply.



IN CASE OF ANY OTHER ISSUE, CONTACT TO SERVICE ENGINEER.

- FAULT * C (MAINS OVER FREQUENCY) : This fault may occur due to improper frequency of mains.

REMEDY:

- ✓ Check the mains supply.



IN CASE OF ANY OTHER ISSUE CONTACT TO SERVICE ENGINEER.

- FAULT * D (SYSTEM SHORT CIRCUIT) : This fault may occur due to short circuiting of output terminals of PCU or due to fault in your load.

REMEDY:

- ✓ Switch off all the MCB's/disconnect the connections of PCU and check the load terminals and load.



IN CASE OF ANY OTHER ISSUE, CONTACT TO SERVICE ENGINEER.

APPENDIX-1 GENERAL FAULT AND THEIR SOLUTIONS

1. INVERTER OUTPUT VOLTAGE IS NOT AVAILABLE

| CAUSE | REMEDY |
|---|---|
| Input DC Voltage is not available | Make it available first |
| MCB switch is kept in OFF position | Check the position of MCB and keep it at ON position |
| Battery connected in reverse polarity | Check the position of ON/OFF switch and keep it at ON position |
| System is trip DC under voltage condition | Assure input DC range is above the DC under voltage cut setting |

2. SOLAR CHARGING IS NOT AVAILABLE

| CAUSE | REMEDY |
|--|--|
| PV voltage is not available | Make it available first |
| PV MCB switch is kept in OFF position | Check the position of PV MCB and keep it at ON position |
| ON/OFF switch is kept in OFF position | Check the position of ON/OFF switch and keep it at ON position |
| PV is connected in reverse polarity | Check the PV connection polarity |
| Check the input PV range is within the specified range | Input PV range should be within the specified range |

3. MAINS CHARGING IS NOT HAPPENING

| CAUSE | REMEDY |
|--|--|
| Mains MCB switch is kept in OFF position | Check the position of mains MCB and keep it at ON position |
| ON/OFF switch is kept in OFF position | Check the position of ON/OFF switch and keep it at ON position |
| Relay and contactors may be faulty | Check relay and contactors are operated |
| Mains voltage is not available | Make it available first |

4. OUTPUT FLUCTUATION

| CAUSE | REMEDY |
|---|--|
| Inappropriate connection of output terminal | Tightly and correctly connect the output terminals |

APPENDIX-2 TECHNICAL SPECIFICATIONS



LOW VOLTAGE MPPT PCU SEOG SERIES SINGLE PHASE



Residences



Petrol Pumps



Schools



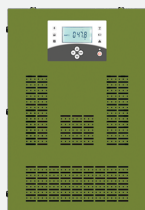
Hotels



Rural Micro Grids



Small Offices



With Energiaa's range of SEOG series 1P inverters, gone is the time where the entire family had to sit in one room in case of a power cut. Now run your heavy loads with powerful designs from Statcon Energiaa, India's most popular Off Grid Solar Inverters that help to save on your electricity costs. Smart management of renewable Solar Power, Grid supply, and Battery allows it to deliver power seamlessly, significantly reducing diesel consumption and electricity bill

| RATINGS | 1KVA/24V | 1KVA/48V | 2KVA/48V | 3KVA/48V | 4KVA/48V | 5KVA/48V | 6KVA/48V | 8KVA/48V |
|-------------------------------------|--|-----------------|-----------------|-----------------|--|-----------------|-----------------|-----------------|
| Model No. | SEOG-024-1K0-1P | SEOG-048-1K0-1P | SEOG-048-2K0-1P | SEOG-048-3K0-1P | SEOG-048-4K0-1P | SEOG-048-5K0-1P | SEOG-048-6K0-1P | SEOG-048-8K0-1P |
| A. MPPT CHARGER | | | | | | | | |
| Type (Buck) | MPPT | | | | | | | |
| Nominal Capacity (KWp) | 1 | 1 | 2 | 3 | 4 | 5 | 6 | 8 |
| Max PV Strings in parallel | 2 | 1 | 2 | 3 | 4 | 5 | 6 | 8 |
| No of MPPT Channel | 1 | | | | | | | |
| Max. Open Circuit Voltage (Voc) | 90 | 190 | | | | | | |
| MPPT Tracking Range (Vmp) | 35-72 | 75-160 | | | | | | |
| Max Output Current (A) | 40 | 20 | 40 | 60 | 80 | 100 | 120 | 160 |
| Peak Efficiency | ≥92% | | | ≥94% | | | | |
| B. SOLAR INVERTER | | | | | | | | |
| Nominal Capacity | 1KVA | 1KVA | 2KVA | 3 KVA | 4 KVA | 5KVA | 6KVA | 8KVA |
| Output Current (A) | 3.5 | 3.5 | 7.0 | 10.4 | 13.9 | 17.4 | 20.8 | 27.8 |
| Battery Voltage (V) | 24 | 48 | | | | | | |
| Output Voltage/ Freq/Phase | 230V(± 2%)/50Hz/1P | | | | | | | |
| Power Factor | 0.8- unity | | | | | | | |
| Peak Efficiency | ≥85% | ≥88% | | | | | | |
| Over Loads: 60 sec/ 30 sec/ 5 sec | 101-110%/111-125%/126-150% | | | | | | | |
| Auto Bypass Feature | Provided | | | | | | | |
| C. GRID CHARGER | | | | | | | | |
| Grid Voltage Range (V) | 230V (+10% & -20%) | | | | | | | |
| Grid Freq Range(Hz) | 50Hz (+5% & -5%) | | | | | | | |
| Max Grid Import Power | 1.5KVA | 1.5KVA | 3KVA | 4.5 KVA | 6 KVA | 7.5KVA | 9KVA | 12KVA |
| D. PROTECTIONS & DISPLAY PARAMETERS | | | | | | | | |
| | PROTECTIONS | | | | LCD PARAMETERS | | | |
| PV Side | • Reverse Polarity, PV Overload, Surge Protection (MOV) | | | | • Voltage, Current, Power , Energy | | | |
| Battery Side | • Reverse Polarity, O/U Voltage, Current Limit | | | | • Voltage, Current, Battery Charging/Discharging | | | |
| Grid Side | • O/U Voltage, O/U Frequency , Surge Protection (MOV) | | | | • Voltage, Current, Frequency | | | |
| Load Side | • O/U Voltage, Overloads, Short Circuit , Surge Protection (MOV) | | | | • Voltage, Current, Frequency, Power | | | |
| Miscellaneous | • Over Temperature | | | | • Mode of Operation, Faults | | | |
| E. MISCELLANEOUS | | | | | | | | |
| Switchgear Protection | MCB/MCCB provided in PV, Battery, Load & Grid path. | | | | | | | |
| LED Indications | Power On, Inverter ON, Solar Present/Charging, Load On Grid/Charging, Battery Low, System Trip | | | | | | | |
| Remote Monitoring | Optional through GPRS based Modem | | | | | | | |
| Degree of Protection | Indoor Type (IP-20) | | | | | | | |
| Operating Temperature | 0-50 degrees (without Derating) | | | | | | | |
| Type of Cooling | Forced Cooled(Temp. Controlled) | | | | | | | |
| Humidity | Max. 95% Non -Condensing | | | | | | | |
| Altitude | 1000m above sea level | | | | | | | |
| Color Shade | | | | | | | | |
| Weight | 25 kg approx. | | 34 kg approx. | 38 kg approx. | 42 kg approx. | 55 Kg approx. | 65 Kg approx. | |
| Dimensions(H X W X D) | 175 X 450 X 360 | | 400 X 275 X 550 | | | 475X300X680 | | |

HIGH VOLTAGE 5-15 KVA SEOG SERIES SOLAR MPPT PCU



Residences



Petrol Pumps



Schools



Hotels



Rural Micro Grids



Small Offices

HIGH VOLTAGE 5-15 KVA SEOG SERIES SOLAR MPPT PCU Built for high performance against tough grid conditions, SEOG high voltage series provides the most economical power saving solutions. Be it the heavy loads of a Petrol pump, or the 24 hour demand of your office loads, or your school that is looking to adopt the use of Solar, this renewable machine will take good care of the energy requirement. Smart management of renewable Solar Power, Grid supply, and Battery allows it to deliver power seamlessly, significantly reducing diesel consumption and electricity bill.



| RATINGS | 5KVA/96V | 6KVA/96V | 8KVA/96V | 5KVA/120V | 8KVA/120V | 10KVA/120V | 12.5KVA/120V | 15KVA/240V |
|-------------------------------------|--|-----------------|-----------------|-----------------|--|------------------|------------------|------------------|
| Model No. | SEOG-096-5K0-1P | SEOG-096-6K0-1P | SEOG-096-8K0-1P | SEOG-120-5K0-1P | SEOG-120-8K0-1P | SEOG-120-10K0-1P | SEOG-240-15K0-1P | SEOG-240-15K0-1P |
| A. SOLAR CHARGE CONTROLLER | | | | | | | | |
| PV Nominal Capacity (Total KWp) | 5 | 6 | 8 | 5 | 8 | 10 | 12.5 | 15 |
| Max PV Strings in parallel | 4 | 5 | 6 | 4 | 6 | 6 | 6 | 5 |
| Charge Controller Type (Buck) | MPPT | | | | | | | |
| No of MPPT Channel | 1 | | | | | | | |
| MPPT Voltage Range | 140-299 | | | 165-299 | | | 365-560 | |
| Max. Open Circuit PV Volts (Voc) | 360 | | | | | | 700 | |
| Max SCC O/P Amps | 50 | 60 | 80 | 40 | 64 | 80 | 50 | 60 |
| Peak Charging Efficiency | ≥94% | | | | | | | |
| B. SOLAR INVERTER | | | | | | | | |
| Nominal Capacity (Total) | 5KVA | 6KVA | 8KVA | 5KVA | 8KVA | 10KVA | 12.5KVA | 15KVA |
| Output Amps per Phase | 17 | 21 | 28 | 17 | 27 | 35 | 43 | 52 |
| Nominal Battery Voltage | 96 | | | 120 | | | 240 | |
| Output Voltage/ Frequency/Phase | 230V/50Hz/1P | | | | | | | |
| Power factor | 0.8- unity | | | | | | | |
| Peak Efficiency | ≥90% | | | | | | | |
| Over Loads: 60 sec/ 30 sec/ 5 sec | 101-110%/110-125%/126-150% | | | | | | | |
| Auto Bypass Feature | Provided | | | | | | | |
| C. GRID CHARGER | | | | | | | | |
| Grid Voltage Range | 230V (+10% & -20%) | | | | | | | |
| Grid freq Operating Range(Hz) | 50Hz (+5% & -5%) | | | | | | | |
| Max Grid Import Power | 7.5KVA | 9KVA | 12KVA | 7.5KVA | 12KVA | 15KVA | 19KVA | 22.5KVA |
| D. PROTECTIONS & DISPLAY PARAMETERS | | | | | | | | |
| PROTECTIONS | | | | | LCD PARAMETERS | | | |
| PV Side | <ul style="list-style-type: none">Reverse Polarity, PV overload, Surge Protection (MOV)Reverse Polarity, O/U Voltage, Current LimitO/U Voltage, O/U Frequency, Surge Protection (MOV)O/U Voltage, Overloads, Short Circuit, Surge Protection (MOV)Over Temperature | | | | <ul style="list-style-type: none">Voltage, Current, Power , EnergyVoltage, Current, Battery Charging/DischargingVoltage, Current, FrequencyVoltage, Current, Frequency, PowerMode of Operation, Faults | | | |
| Battery Side | | | | | | | | |
| Grid Side | | | | | | | | |
| Load Side | | | | | | | | |
| Miscellaneous | | | | | | | | |
| E. MISCELLANEOUS | | | | | | | | |
| Switchgear Protection | MCB/MCCB provided on PV, Battery, Load & Grid path. | | | | | | | |
| LED Indications | Power On, Inverter ON, Solar Present/Charging, Load On Grid/Charging, Battery Low, System Trip | | | | | | | |
| Remote monitoring | Optional through GPRS based Modem | | | | | | | |
| Degree of Protection | Indoor Type (IP-20) | | | | | | | |
| Type of Cooling | Forced Cooled(Temp. Controlled) | | | | | | | |
| Operating temperature | 0-50 degrees (without Derating) | | | | | | | |
| Humidity | Max. 95% Non -Condensing | | | | | | | |
| Altitude | 1000m above sea level | | | | | | | |
| Color Shade | | | | | | | | |
| Weight | 94 kg approx. | 99 kg approx. | 110 kg approx. | 94 kg approx. | 106 kg approx. | | | 138 Kg approx |
| Dimensions(H X W X D) | 652 X 375 X 825 | | | 590 X 400 X 700 | | | 650 X 450 X 753 | |

APPENDIX-3 TERMS AND CONDITIONS OF WARRANTY

Statcon Energiaa Pvt. Ltd. (henceforth SEPL, the company, manufacturer, Statcon Energiaa Pvt. Ltd.) warrants to the end-purchaser, provided the purchaser is able to provide valid and legal invoice receipt as well as warranty card duly signed by the dealer/ manufacturer. If any defect(s) should be found in SEPL's manufactured PCUs within the warranty period, SEPL's only obligation is to repair or replace, at its sole discretion, any part shown to be defective, with a new part or equivalent at no cost to the owner for parts or labour. Such defective parts, which have been replaced, shall become the property of SEPL. The owner/end-customer is responsible for any repair or replacement that are not covered under this warranty. Products once sold will not be replaced or bought back.

The product warranty period will be preferred as per sales agreement with terms and conditions, the regular warranty period for the products is 27 months from the date of dispatch from manufacturer or 24 months from date of purchase, whichever is earlier, unless mentioned differently by SEPL in the signed Warranty Card (not applicable for spares or consumables). Consumables items in the products like string fuses, SPD, MOV, switches, plugs, timer, door locks, sockets etc. are excluded from warranty will be replaced on a company-defined chargeable basis. Warranty on items such as contactors, relays, switchgears and circuit breakers are covered for one year only. The warranty will be valid only if the product is used within its manufacturer-advised specification, as stated in product manual supplied along with the product. The warranty for the replaced components will lapse along with that of the main instrument. SEPL reserves the right to make changes in design and specification without notice and without obligation to install changes in unit previously supplied. Repairs are performed at site for ratings ≥ 3 kVA. For ratings below 3 kVA, units will be replaced at our nearest available service centre.

Warranty for spares order will be separate. the warranty will automatically terminate upon the expiry of the warranty period, even in case of the product not being in use in the specified period. The purchaser shall intimate any change of address to the concerned authorised Service Centre and the warranty will be applicable only after the inspection of the unit and clearance of the product condition by authorised Service Centre personnel. Only authorised representative/ dealers of the company, across India, can provide free service under the terms of warranty, if found otherwise, the warranty will stand null and void. For a warranty claim to be valid, the warranty card of the respective product bearing the date of manufacturing/ purchase must be fully legible and the end customer invoice, must be available. SEPL' HBD, ECO HBD, ESS, SEOG MPPT series of PCUs are used with battery only, and SEPL shall, in no way, be responsible for cases like battery failure, poor battery back-up, poor solar generation, or an increase in electricity bills. Also SEPL will not be responsible for the poor quality of site-workmanship (installer-workmanship), plant electrical wiring, load-segregation, lightning/ surge protection devices on the site (essential elements for solar site), proper earthing and earth arrangement and fluctuation and/or voltage surge on the Grid/Mains side.

The company will not be held liable in any condition for any loss, injury or damage caused to life or property, or death and disability caused to any form of life for any reason whatsoever. In any situation whatsoever, any claims arising out of this will not exceed the basic cost of the said Inverter/PCU as per SEPL's invoice for the said serial number. In case of sale of non-manufactured items (as part of combo billing or other-wise). SEPL's liability is only limited to the extent of forwarding any warranty-related issues to the respective manufacturer of the product, who will be directly giving service and will be liable. for this, the original warranty card of the respective item's manufacturer will be supplied. The company expressly denies the right of any person to incur or assure, on behalf of it, within the warranty period, a product exhibits a defect which compromises its functioning (a warranty claim), the company will at its discretion, either repair the product at the premises, or replace its part(s) (if deemed necessary by the manufacturer) with a used or new one, of equivalent type and age.

Purely aesthetic defects which have not effect on product functionality or operability are not covered under the warranty. This includes sound, weight, lack of wheels, display brightness level, buzzer, and so on. If SEPL decides that a defective product is to be repaired at the end-customer's premises, it will arrange for the repair on a mutually decided date with the end-customer and/or Installer.

The company then sends an authorised service engineer to the customer's premises at the arranged date and time. SEPL reserves the right to decide as to whether the out of warranty repair work should be carried out at the company's service centre, at site or any other place. the freight incurred for to end for dispatch of the defective material will have to be borne by the customer, and the transit risk for the material will rest with the purchaser. The warranty is valid only for end-customer residing in India and within a 100km radius of the

distributor purchased from, unless a written letter or email by the manufacturer is provided for longer distances. Selling in war-prone areas, hill-terrain regions without informing the manufacturer will lead to lack of servicing from the manufacturer.

Place not covered under warranty – Andaman & Nicobar Island, Kerala, Leh, Tamil Nadu, Andhra, Tripura, Mizoram, or any other place not accessible by Indian Railways or Govt. buses. Claims, if any, to this warranty shall be made only before courts having jurisdiction in Gautam Buddha Nagar, Uttar Pradesh.

The warranty will not apply if the original enclosure is found opened or tampered with, Warranty in case of defect caused by household pets, rats, cockroaches or other animals or insects is invalid. The warranty will be invalidated if defects arise, in company's assessment. due to accident, abuse, misuse, neglect, improper transport, improper installation (if not undertaken by the company or its representative), fire, flood, water seepage, other acts of God (force majeure), natural calamities and any other un-authorized repairs done. Such repair expenses will have not be borne by the purchaser, Services given for the same will be paid services. It is mandatory that said PCU is stored/kept under use a dust-free and covered area with free airflow available. It is not designed for use in open under the sun, unless very specifically deigned manual. Intimation installation so as to avoid installation-authorization and for claiming this warranty.

Warranty of your PCU shall become null and void in the following cases:

- Force majeure (for example: storm damage, lightning, fire, thunderstorm, flood, Covid-19 related lockdowns, earthquakes etc.
- Incorrect use or operation/ installation and commissioning (for example: loose connection of AC and DC wires, unclean panels, fluctuating or low voltage from grid, overload at customer end, improper string connection, angle of panels, low gravity of batteries, improper maintenance of batteries etc.)
- Failure to comply with the operating, installation and /or maintenance manual.
- Heavy soiling with dirt or dust, or water/ moisture inlet into the product.
- Transportation damage, where transport has not been done by the manufacturer.
- Changes to the product or repair attempts without prior approval/ authorisation from SEPL.
- Failure to comply with the applicable safety regulations.
- The CU is not concerned properly and/or is used incorrectly.
- The content (e.g., the date of purchase, credential etc.) of the warranty card and invoice are found to be tampered with.
- The serial number on the barcode is not same as on the PCU.

APPENDIX-4 SERVICING AND CUSTOMER CARE

In the unlikely event that you encounter any technical issues with one of our products, please contact our servicing customer support in one of the following ways:

1. Email us at servicing@energiaa.in
2. Call us at 1800-891-3319 (toll free)
3. Message us on Energiaa Care WhatsApp: +91-9821396421
4. Scan the QR Code below and directly message us on WhatsApp:



5. Visit us at www.energiaa.in for updated servicing contact details and to know more about our product range.



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