PVblink
INVERTER

shine 24

**THE MOST POWERFUL
SOLAR MPPT INVERTER
RUNNING ON JUST
2 BATTERIES**

PVblink
INVERTER

- Runs 1 HP Pump + ALL household loads*

- High-quality IGBT-based MPPT design

- Quick Battery Charging from Solar/ Grid: upto 65A/ 18A

- Can connect to PV Modules upto 2000W - Poly/ Mono/ Mono Perc

- Also Works for non-Solar home applications

- Compact, no-plastic, all-metal shell for toughness & long life

- 'LOADS' OF SMARTNESS: Multiple modes of operation, reduced gridconsumption, PV-generation data stored

PRODUCT MANUAL

Contents

Copyright Declaration

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 SHINE SERIES MPPT-Based PCU. This operating manual is applicable for bullet series PCU provided in writing by PVblink Technology Pvt. Ltd. (hence for the 'PVblink Technology Pvt. Ltd.' or the company').

Sr. No.	Model
1	Shine24

Table 1

Keep this manual close to the PCU 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, de-energize the system & remove the battery fuse from fuse holder or disconnect the battery connection.
✓ 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:

✓ Earthing 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
✓ User Manual
✓ Spare Fuse (Battery + Mains)
✓ Interconnecting Cables with Lugs

2. INTRODUCTION

2.1 PRODUCT DESCRIPTION

The SHINE SERIES 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 1 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.
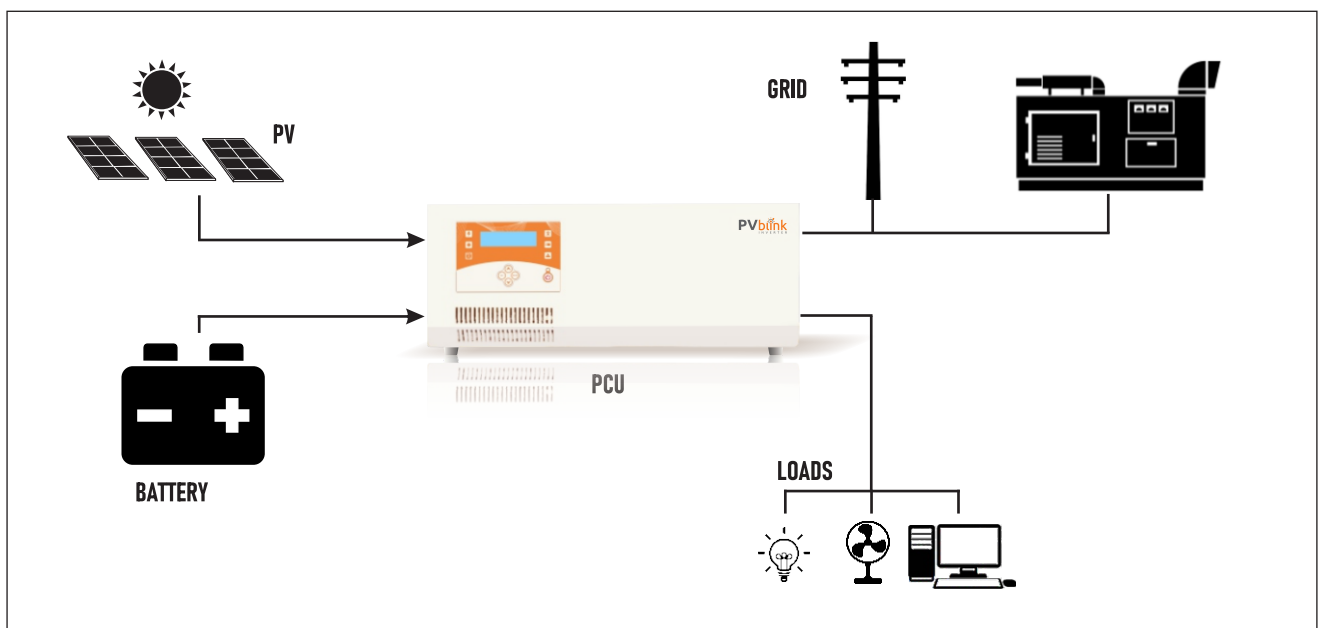
Figure 1

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.energiaa.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 PHYSICAL APPEARANCE & TERMINATION DETAILS OF INVERTER

SHINE SERIES MPPT-Based PCU comes in sheet metal enclosure of standard sizes with table top mounting and colour shades as mention in Table 2.
This unit is for Indoor application only and should not be kept in open.
All the wire connections to unit are made from the rear side.

SR. NO.	PRODUCT	DIMENSIONS (W X D X H)	ENCLOSURE TYPE	COLOUR SHADE	VIEWS
1	Shine 24	415 X 375 X 175	TABLE TOP TYPE	WHITE	Figure 2

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.

2.2.1 TABLE TOP TYPE MODEL : SHINE 24

FRONT VIEW

REAR VIEW
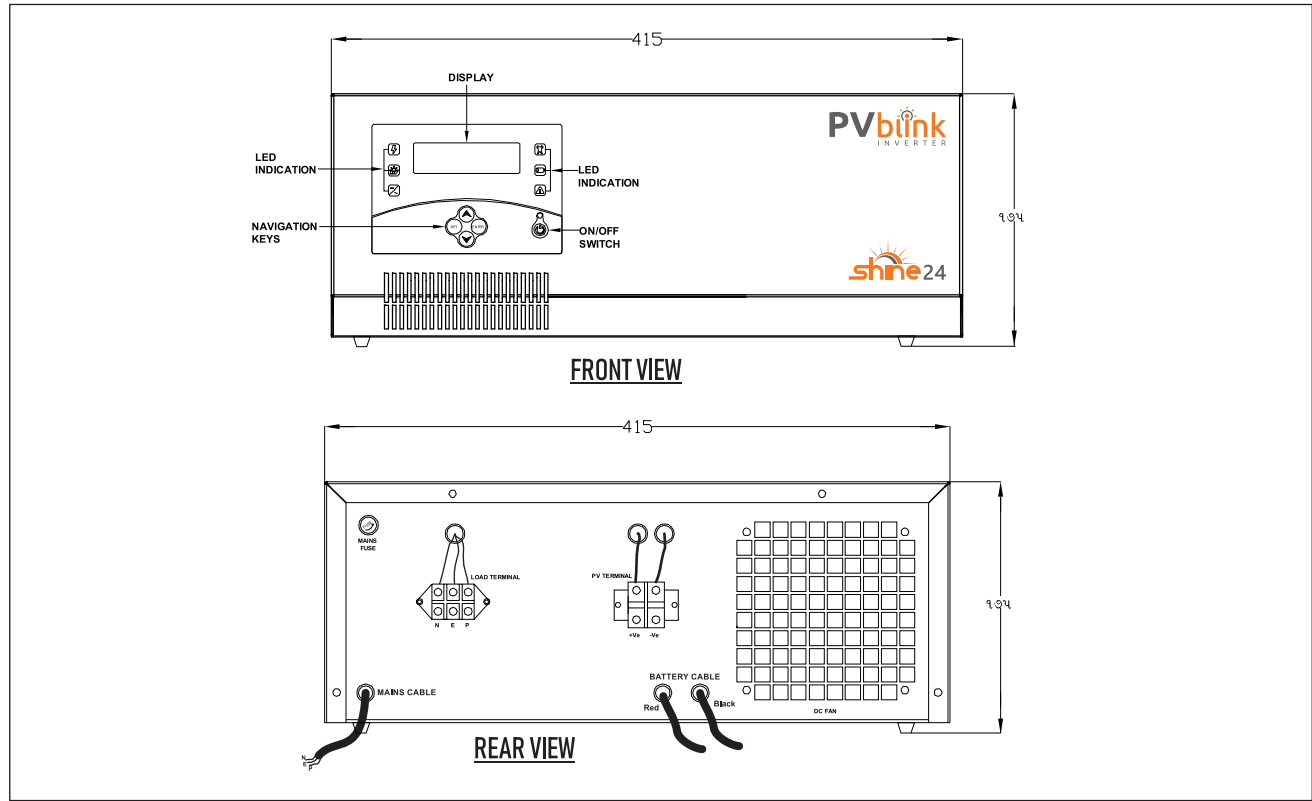
Figure 2

2.3 FEATURES

➢ Shine series PCUs provide a complete solution for 220V AC, 50Hz power requirements. This series PCUs are rich in the following features:

2.3.1 5 MODE PRIORITY SELECTION AS PER USER REQUIREMENT

✓ MODE-1 : Super Saver 40
✓ MODE-2 : Super Saver 50
✓ MODE-3 : Super Saver 60
✓ MODE-4 : Backup Mode
✓ MODE-5 : No Solar Mode

2.3.2 MONITORING

✓ 16x2 LCD display in its class for great visuals.

2.3.3 INDUSTRIAL GRADE INVERTER

✓ Designed for reliability against frequent grid variations.
✓ Our Transformer provides galvanic isolation & has a long life.

2.3.4 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

3. INSTALLATION

3.1 LOCATION AND PLACEMENT
3.1.1 PCU

The Inverter should be placed in accordance with the following:
✓ Unpack PCU completely then unwrap the stretch film from PCU.
✓ Keep it 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 proper 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.

3.1.2 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 (refer the table 3 for cable sizing).

3.1.3 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.

3.1.4 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 on next page:

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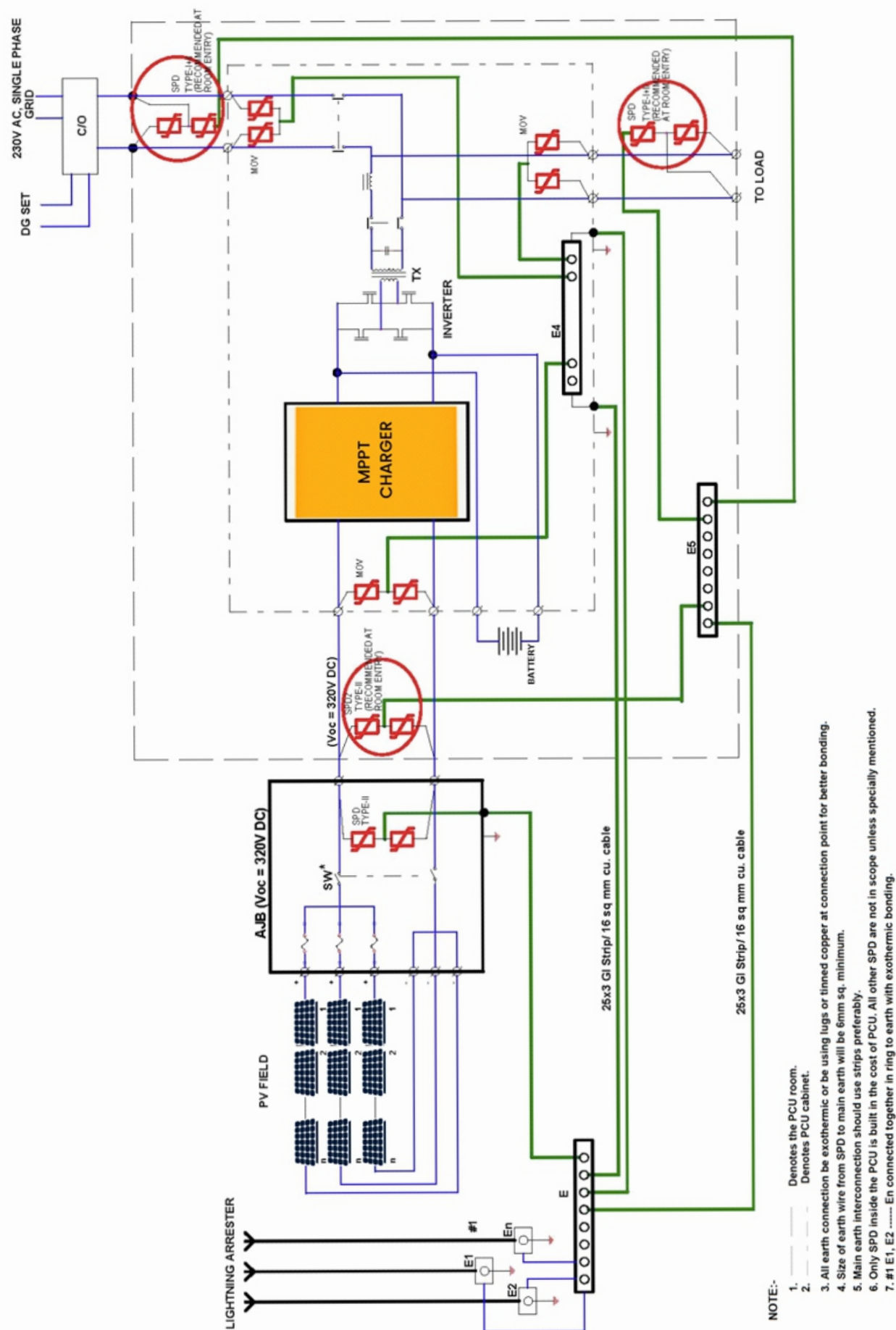
3.2 ELECTRICAL WIRING

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

THIMBLE/LUG size should be same as wire size given below.

Wire size (SQ. MM) Details				
PCU Model	Mains Wire	Load Wire	PV Wire	Battery Wire
Shine 24	2.5	1.5	10	16

Table 3
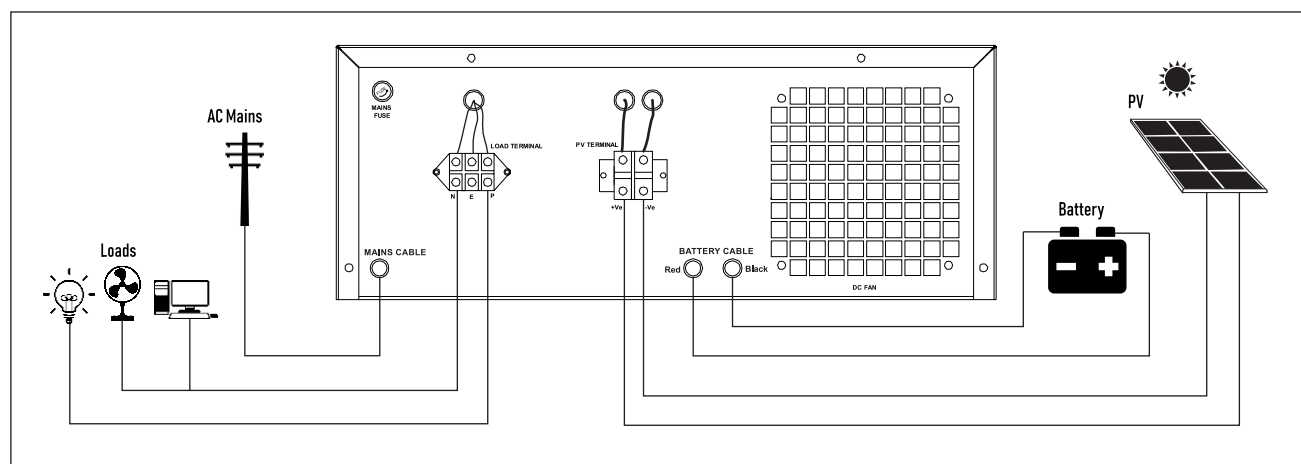
Figure 3

3.3 ELECTRICAL CONNECTIONS

3.3.1 CONNECTION TO THE BATTERY

✓ Connect the +ve terminal of the battery to the red wire from (BATT+) terminal of PCU.
✓ Connect the –ve terminal of the battery to the black wire from (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 OTHER CONNECTION NOT DONE.

3.3.2 CONNECTION TO AC MAINS SUPPLY IN

✓ 3 core mains cable from mains terminal is for mains input supply.
✓ Connect red wire to 'P' of the Phase point of mains supply socket.
✓ Connect the black wire 'N' of the neutral point of mains supply socket.
✓ Connect the green wire 'E' of the earth point of mains supply socket.
✓ Make sure that socket/terminal/wire rating should be such a way to handle ac power without any damage.

3.3.3 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.

3.3.4 CONNECTION OF LOAD : LOAD OUT

✓ Use a 3-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 'P' terminal of PCU.
✓ Connect the Neutral wire of the Load to the 'N' terminal of PCU.
✓ Connect the Earth wire of the Load to the 'E' terminal of PCU.
✓ Follow the wire size and lug details as per given in Table 3.

3.4 INSTRUCTION TO FOLLOW

✓ Charge the batteries before first use.
✓ Use thimbles for proper connection of wire at screw terminals

Figure 4
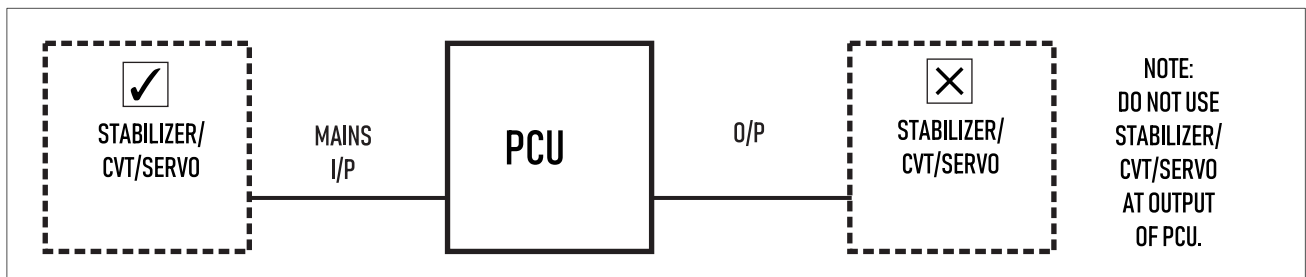
Figure 5

3.5 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 earting 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 above is as drawing.

3.6 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 connecting the PCU with battery display switched ON.
➢ Now press the power button given below the display for a few seconds till the yellow LED comes ON.
➢ Your PCU will start now.

3.7 LED INDICATION & KEYPAD DETAILS
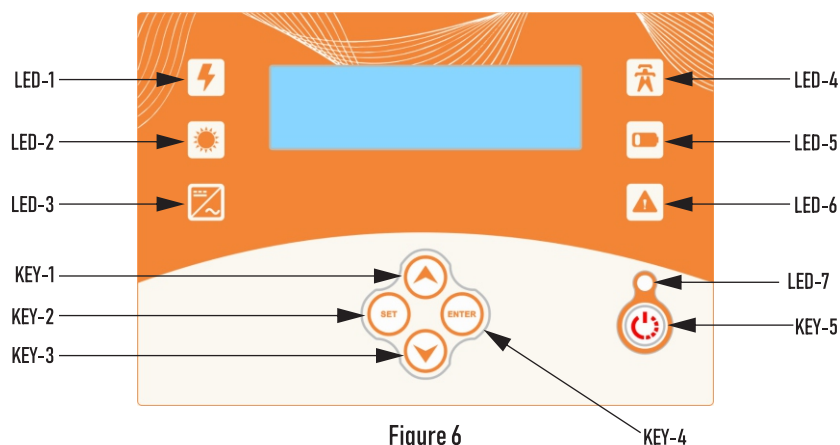
Figure 6

LED	INDICATION NAME	COLOUR	IF LED OFF	IF LED BLINKING	IF LED CONSTANT ON
LED-1	POWER ON	BLUE	POWER OFF	NA	POWER ON
LED-2	SOLAR ON	YELLOW	SOLAR OFF	CHARGING	SOLAR ON
LED-3	INVERTER ON	GREEN	INVERTER OFF	NA	INVERTER ON
LED-4	GRID ON	YELLOW	GRID OFF	GRID CHARGING	LOAD BYPASS TO GRID
LED-5	LOW BATTERY	RED	BATTERY OK	BATTERY LOW ALARM	BATTERY LOW CUT
LED-6	FAULT	RED	NO FAULT	NA	FAULT
LED-7	SWITCH ON	YELLOW	SWITCH OFF	NA	SWITCH ON

Table 4

- ✓ KEY-1 : INC Key use to change the value of parameters.
- ✓ KEY-2 : SET key use to select the parameters.
- ✓ KEY-3: DEC Key use to change the value of parameters.
- ✓ KEY-4: ENTER Key use to accept/exit.
- ✓ KEY-5: ON/OFF Key use to switch ON/OFF and reset the system.

📝 PRESS AND HOLD ON/OFF KEY TO TURN ON YOUR PCU, YELLOW LED NEARBY KEY WILL START GLOWING, WHICH INDICATES INVERTER IS SWITCHED ON.

📝 LED OF CHARGING SOURCE WILL KEEP BLINKING DURING CHARGING.

4. DISPLAY

4.1 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

✓ Press "INC" key to change from auto scroll to manual to see each parameter manually scrolled can be done through one by one by pressing INC key successively.

✓ To enable auto scroll key press ENTER key.

4.2 DISPLAY PARAMETERS

❖ BATTERY : Voltage, Charging Current, Discharging Current, Status.

❖ PV : PV Voltage, PV Current, PV Power, PV Today's kWH, PV Total kWH.

❖ INVERTER : Voltage, Current.

❖ GRID : Voltage, Frequency.

❖ LOAD : Voltage, Load %, Load Frequency.

❖ SYSTEM STATUS : Priority Mode, Working Mode, Grid charging Enabled/Disabled, Switched ON/OFF.
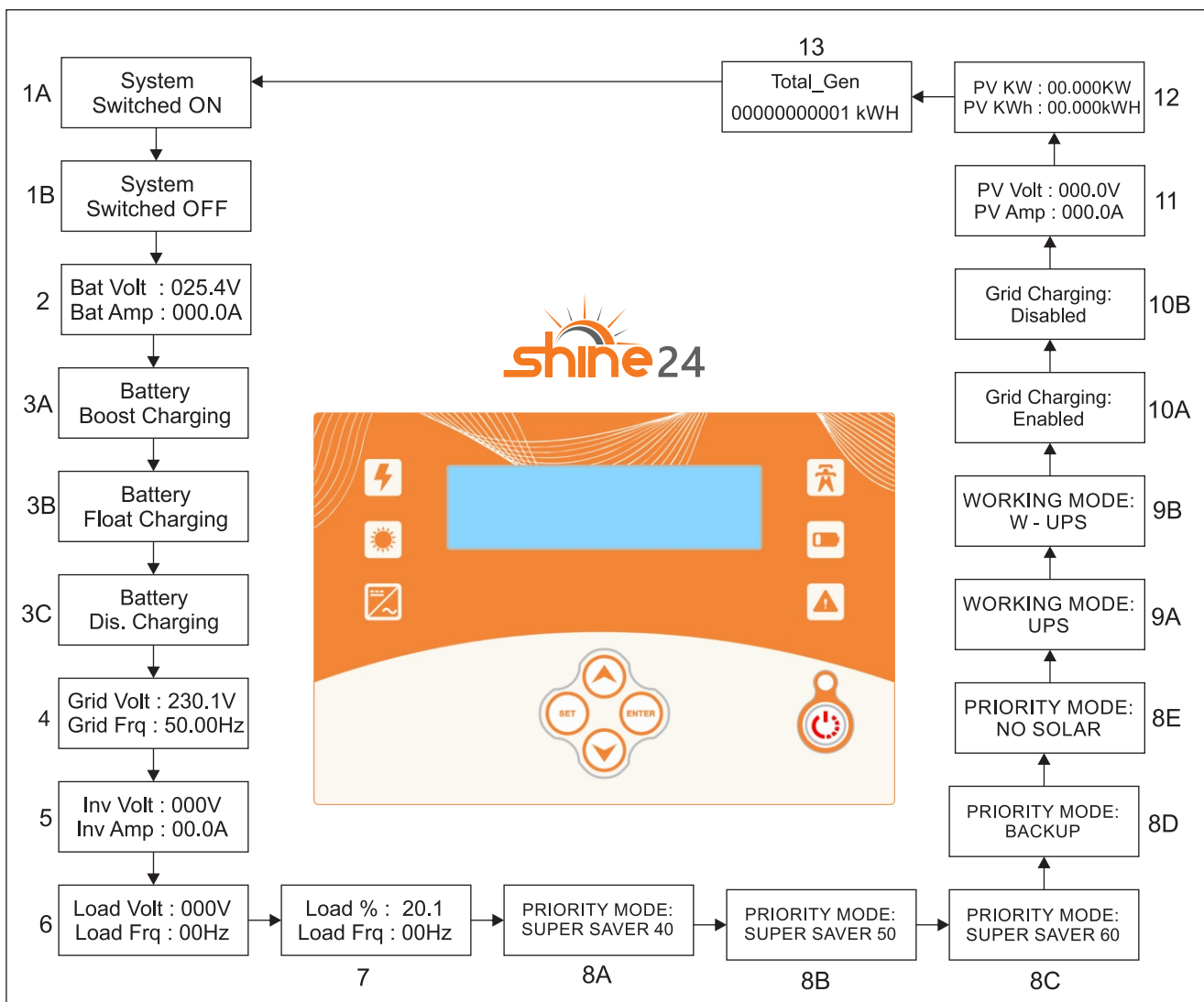
Figure 7

4.3 MENU SETTING

✓ Long Press SET key to enter MENU setting Mode.

✓ In MENU press INC key successively to go in USER LOGIN, FACTORY LOGIN and CALIBRATION LOGIN. To exit from this mode press ENTER key.

4.3.1 USER LOGIN

✓ Press SET key to enter in user login when displayed on screen.

✓ After entering in user login it will show software versions and system rating.

✓ Press SET/INC/DEC key to select your battery type, Priority mode, Battery AH, working mode, Grid charging Enabled/Disabled as per figure 8.

4.3.2 FACTORY SETTINGS MODE

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

4.3.3 PARAMETER CALIBRATION MODE

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

4.4 MENU SETTING FLOW CHART
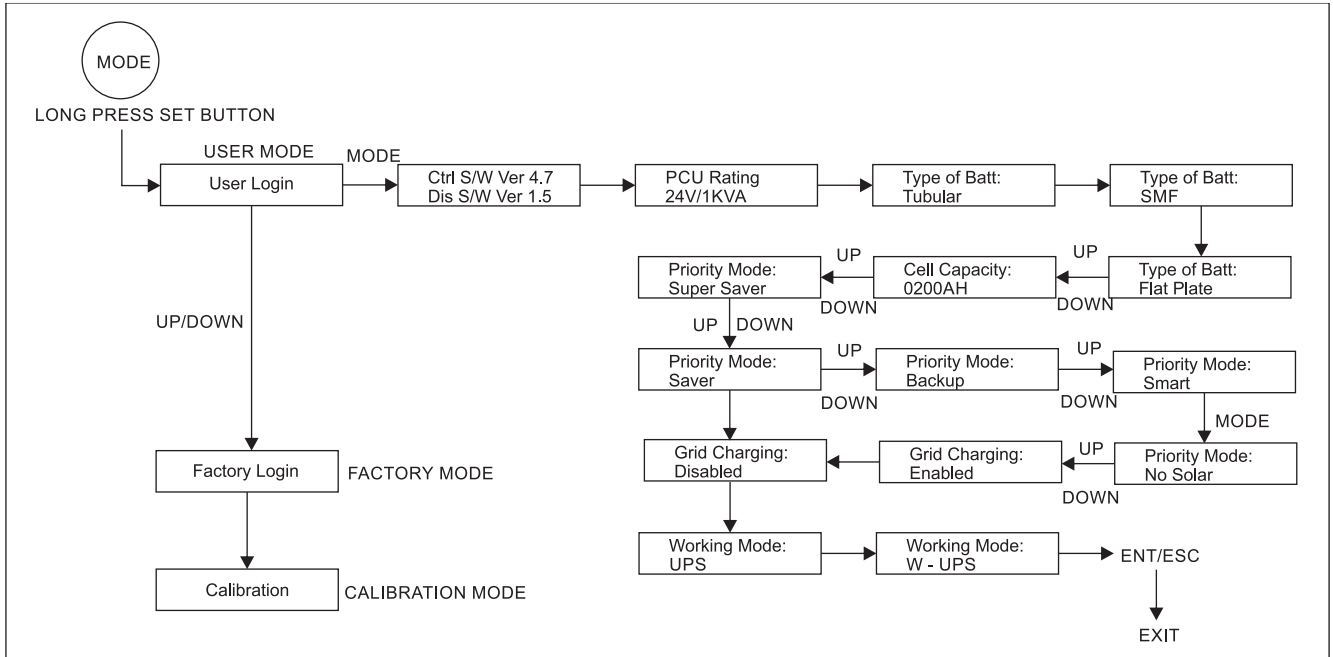
Figure 8

✎ IN USER LOGIN BATTERY TYPE, BATTERY CAPACITY, PRIORITY MODE etc. MUST BE CHOSEN PROPERLY AS PER REQUIREMENT.

4.5 FAULT ANALYSIS

4.5.1 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 till one minute. By pressing ENTER key after checking the fault type in LCD, buzzer sound gets deactivated.

4.5.2 FAULT DISPLAY

If any fault occurs in the PCU system, predefined fault start displaying after pressing ENTER key.

FAULT NAME IN DISPLAY	FAULT DESCRIPTION
SYSTEM TRIP/OFF	When system Shuts Down due to any fault/internal error
INVERTER UNDER VOLTAGE	When Inverter O/P Voltage goes below inverter under voltage set value
INVERTER OVER VOLTGE	When Inverter O/P Voltage goes above inverter over voltage set value
BATTERY UNDER VOLTAGE	When Battery Voltage goes below the battery under voltage set value
BATTERY OVER VOLTAGE	When Battery voltage goes above the battery over voltage set value
SOLAR CHARGE OVER LOAD	When Over Rated PV panel connected to the system
PV OVER VOLTAGE	When PV panel or PV string voltage connected beyond the maximum allowe PV voltage range value
SYSTEM OVER LOAD	When Inverter O/P Load goes above the rated system
GRID UNDER FREQUENCY	When Grid/DG supply frequency goes below the under frequency set value
GRID OVER FREQUENCY	When Grid/DG supply frequency goes above the over frequency set value
SHORT CIRCUIT	It Indicates that Inverter O/P short circuited
SYSTEM OVER TEMPRATURE	When temperature of inverter system goes above the safe range
GRID BACK FEED	When Grid supply connected to the load point directly
MAINS OVER VOLTAGE	When mains voltage goes above the set grid over voltage value
MAINS UNDER VOLTAGE	When mains voltage goes below the set grid under voltage value

Table 5

5. OPERATING MODES

5.1 DETAILS OF PRIORITY MODES

MODES	EXPLANATION OF MODE / REASON TO SELECT THE MODE
Super Saver 40	Solar+Battery will run loads till battery reaches 40% DOD. At 40% DOD, grid will bypass to load, and solar power if available will charge the battery. Grid charging of battery will start if battery reaches 60% DOD. (only applicable if grid charging is enabled)*
Super Saver 50	Solar+Battery will run loads till battery reaches 50% DOD. At 50% DOD, grid will bypass to load, and solar power if available will charge the battery. Grid charging of battery will start if battery reaches 70% DOD. (Only applicable if grid charging is enabled)*
Super Saver 60	Solar+Battery will run loads till battery reaches 60% DOD. At 60% DOD, grid will bypass to load, and solar power if available will charge the battery. Grid charging of battery will start if battery reaches 80% DOD. (Only applicable if grid charging is enabled)*
Backup Mode	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 more than 80% of its capacity to make sure to get more battery backup in night time as compared to above 3 modes.*
No Solar	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 6

Note: *Above stated battery's DOD % & charged % is estimated (based on Battery Voltage only) but not actual. This holds true for all percentage mentioned in the table above and everywhere in manual.

6. MAINTENANCE & TROUBLESHOOTING

6.1 VISUAL INSPECTION

➤ Inspect the PCU and the cables for visible damage and pay attention to the operating status display of the PCU.
➤ 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 eletricians.

✒ 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 PCU.
➤ Only the exterior of the PCU should be cleaned.
➤ Use a soft and dry brush to remove dust from the fan cover and from the top side of the PCU on a regular basis.

⚠ LETHAL VOLTAGES ARE STILL PRESENT IN THE TERMINALS AND CABLES OF THE PCU EVEN AFTER THE PCU 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 deep depth of discharge 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.

➤ SYSTEM TRIP/OFF : 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 system trip/off refer their remedies. Immediate consultation with a service expert is required.

✒ IN CASE OF ANY OTHER REASON CONTACT TO SERVICE ENGINEER.

➤ PCU 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.

➤ 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.

➢ 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.

➢ 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.

➢ 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 enviroment.
✓ Check the ventilation holes of PCU. They should not be blocked.

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

➢ SOLAR OVERLOAD : This fault may occur due to connecting the PV Panel of higher rating from the suggested rating of your PCU.

REMEDY:
✓ Check the PV rating.

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

➢ SOLAR OVER VOLTAGE : This fault may occur due to exceeding the PV input voltage from the suggested PV range.

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

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

➢ 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.

➢ BATT_UNDER_VOLTAGE_ALARM : This fault/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.

➢ 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.

➢ 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.

➢ SYSTEM SHORT CIRCUIT : This fault may occur due to short circuiting of output terminals of PCU or due to fault in your load.

REMEDY:

- ✓ Disconnect the connections of PCU and check the load terminals and load.

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

➢ SYSTEM OVER TEMPERATURE : This fault may occur due to cooling/ventilation may not proper in the place where PCU system installed.

REMEDY:

- ✓ Install the PCU in proper ventilated area.

📝 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
Battery connected in reverse polarity	Check and connect in correct polarity
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
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
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

Parameter	RATING
Models	Shine 24
Nominal DC voltage	24 Volt
MPPT CHARGER	
Type of charger	MPPT
No of MPPT channels	One
Switching element	IGBT
Max. connected PV modules	2000 Watts
Max. MPPT output current	65 Amps
Max. battery charging current (Settable)	65 Apms
Max. open circuit PV voltage	105 Volts
MPPT voltage range	35-84 Volts
Min. PV voltage	28 Volts
Max. input PV current	50 Amps
Recommended PV configuration (for polycrystalline)	2 Series x 3 Parallel
Recommended PV configuration (for Mono/ Mono perc)	1 Series x 5 Parallel, 2 Series x 2 Parallel
MPPT peak efficiency	93%
SOLAR INVERTER	
Input power at peak load	2100 Watts
Discharging battery current at peak load	87 Amps
Switching element	MOSFET
Nominal battery voltage	24
Nominal output voltage	220 V
Nominal output frequency	50
Output voltage range (at nominal battery voltage)	180-220 Volts
Max. output nominal current	8 Amps
Overloads	100-125% (120 Seconds), 126-150% (5 Seconds), 151-200% (2.5 Seconds), >200% (Immediate)
Overload restart (not applicable for UPS mode)	3 Times auto restart and then manual reset
Controller type	DSP based
Output type	Pure sine wave
Input source	PV/Battery
Peak inverter efficiency	>85%
Total harmonic distortion	less than 5%
Changeover time in UPS mode	less than 15 msec
Changeover time in wide range mode	less than 25 msec
UPS mode (for IT loads)	Provided
Wide grid operation mode (for non IT loads)	Provided
BATTERY	
Battery under cut alarm	21.1 Volts (auto adjustable)
Battery under cut	20.5 Volts (auto adjustable)
Load dependent battery undercut feature	Provided
Float charging voltage (factory settable)	26.4V (tubular)/27V (SMF)/ 26.8V (flat plate)
Boost charging voltage (factory settable)	29.4 (tubular)/27.6V (SMF)/ 27.4V (flat plate)
GRID CHARGER	
Grid operating voltage range (UPS mode)	120-280 Volts (+/- 10V)
Grid under cut recovery voltage (UPS mode)	135 Volts (+/- 5V)
Grid over cut recovery voltage (UPS mode)	265 Volts (+/- 5V)
Grid operating voltage range (wide range mode)	180-260 Volts (+/- 10V)

PARAMETER	RATING
Grid under cut recovery voltage (wide range mode)	195 Volts (+/- 5V)
Grid over cut recovery voltage (wide range mode)	245 Volts (+/- 5V)
Load output voltage during byass mode	Same as input voltage
Grid input frequency range	47-53 Hz
Load output frequency during byass mode	Same as input frequency
Max battery charging current from grid	18 Amps (settable)
Battery charging from grid enable/ disable	Provided
Input source supported	Grid/Diesel generator
DISPLAY/PROTECTIONS/INDICATIONS	
Protections	PV: Reverse polarity, Battery reverse power, PV power limit Battery: Under voltage cut, Over voltage cut, Reverse polarity, Overcharge limit (BCL), Battery fuse Grid: Over voltage, Under voltage, Over frequency, Under frequency, Grid fuse Load: Overload, Short circuit, Over heat, Output low, Grid back feed, Prevent bypass in Ph-Ph condition
Display parameters	PV: Voltage, Amps, Power, Total KWH generation. Battery: Voltage, Amps, Charge/Discharge status Grid: Voltage, Frequency. Load: Voltage, Load%, Frequency. System: Operation modes (UPS/Wide range), Priority selection, Grid Charging enable / Disable, Battery status (Charging/Discharging)
Display faults	PV: PV over voltage, PV over load Battery: Battery under voltage, Battery over voltage Grid: Grid under voltage, Grid over voltage Load: Overload, O/P short circuit System: Over temperature
Audio buzzer	Overloads, Short circuit, Low battery alarm, Battery under cut, Change in grid status (beep)
Front panel LED	Power on, Inverter on, SPV present/ SPV charging, Grid present/ Grid charging, Battery under cut/ Alarm, Fault
Front panel switches	Reset for system On/Off, Up, Down, Back, Enter
Display type	16 x 2 Alpha numeric display with backlight
ENVIRONMENT	
Operating temperature	0-50 degrees ambient
Storage temperature	0-50 degrees ambient
Max. relative humidity @25°C (non condensing)	95%
Degree of protection	IP20
Dimensions(LxWxH)*	415 X 357 X 160 (in mm)
Cooling	Temp controlled fan cooled
Terminations	PV: 25mm2 Screw type terminal blocks Battery: 1mtr Cable lengths with ring type lugs Load: 6mm2 Pin type terminal block (3 Way) Grid: 1mtr 3 Core cable.
Accessories supplied	Manual, Battery fuse (3 Nos), Grid fuse (1 Nos), Warranty card, Battery connecting cable

*Specifications are subject to change without prior notice due to constant improvement in design and technology.

The above models are compatible with lead-acid batteries only.

APPENDIX-3 TERMS AND CONDITIONS OF WARRANTY

PVblink Technology Pvt. Ltd. (henceforth PVblink Technology Pvt. Ltd., the company, manufacturer, PVblink Technology 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 PVblink Technology Pvt. Ltd.'s manufactured PCUs within the warranty period, PVblink Technology Pvt. Ltd.'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 PVblink Technology Pvt. Ltd.. 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 PVblink Technology Pvt. Ltd. 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. PVblink Technology Pvt. Ltd. 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. PVblink Technology Pvt. Ltd.'s HBD, ECO HBD, ESS, SEOG series, BULLET series of PCUs are used with battery only, and PVblink Technology Pvt. Ltd. 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 PVblink Technology Pvt. Ltd. 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 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 PVblink Technology Pvt. Ltd.'s invoice for the said serial number. In case of sale of non-manufactured items (as part of combo billing or other-wise). PVblink Technology Pvt. Ltd.'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 no 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 PVblink Technology Pvt. Ltd. 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 arrange date and time. PVblink Technology Pvt. Ltd. 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 and 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.

Places 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 in 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-authorised 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 and supplied, which shall be mentioned in the technical specification of the product manual. Intimation to manufacturer is mandatory in case of change of location of the initial inverter installation so as to avoid installation-authorisation and for claiming this warranty.

Warranty of your PCU shall become null and avoid 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 PCU is not connected 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 WARRANTY CARD

Please find attached a Warranty Card at the end of this manual. Kindly ensure you keep it safe as this will the only way to claim your warranty against this product. Please make sure your installer/dealer fills the warranty card and gives you the customer copy. In case of any issues regarding the warranty claims, you can contact PVBlink Technology Pvt. Ltd. our customer support.

Office : 1007, Fortune Business Hub, Nr. Shell Petrol Pump, Science City Road,
Sola, Ahmedabad, Gujarat-380060.
Contact: +91 78618 68893
Website: www.pvblink.com
Email: info@pvblink.com
All Right Reserved
PVBlink Technology PVT. LTD.

PVblink
INVERTER