

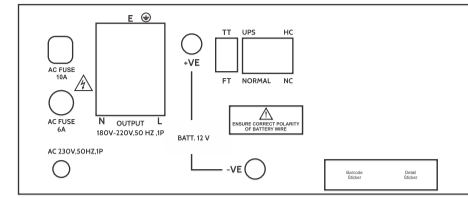
# marvel POWER INVERTER



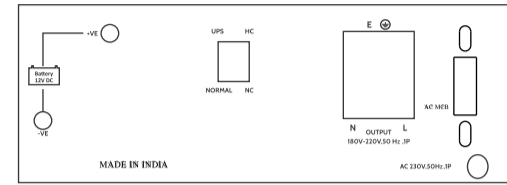
## USER MANUAL

COND000002131

### BACK PANEL



MI 1000



MI 1400

### OVERVIEW

At the very outset, allow us to congratulate you on your excellent choice of UPS. In a world of me too products, you will find Pure Sine Wave UPS a generation ahead of the entire category. That's because our break through 'chip embedded sine wave' technology delivers the same current as you get from your mains.

The distinguishing features of Pure Sine Wave UPS are:

- Sine Wave Output suitable for PC
- DSP Based Intelligent Control Circuit
- Graphical (LED) / LCD Display (Message and Faults)
- DSP Based Smart Charger
- Smarter Overload Senses & Short Circuit Protection
- Easy to Service
- Battery State Monitoring
- ASIC Technology
- Great Power Saving
- Automatic Power Factor Correction
- Future Expandability possible

This manual has been specially created to give you a thorough understanding of your UPS and its optimum use. Do spare some time to read it carefully. In case you need help at any time, please feel free to contract our dealer. Any suggestions, comments or grievances are welcomed; after all, the ultimate 'Quality Manager' of any product is the customer. Your insights guide our innovations.

### KNOWING YOUR UPS

Now let's begin the journey to explore various aspects of our Pure Sine Wave UPS Welcome abroad. In its most basic form, a UPS transforms Direct current (DC) to Alternating Current (AC). The battery pack with the UPS acts as a reserve to ensure continuous supply of power whenever mains supply from utility power is not available.

Position No.	Function	Remarks
1	Output Socket / Terminal	Coonect your load wire here to get the ouput from UPS
2	Mains Input Lead/Terminal	Used to connect UPS to Input AC Mains Supply
3	Cooling FAN Outlet	To maintain temperature by forced cooling; Avoid blockage to this point
4	Input AC Mains Circuit Breaker (Fuse / MCB)	Used for protection from overload and short circuit - AC Input Mains Supply End.
5	Battery DC Input (Wires / Terminals)	Red & Black to connect positive and negative terminals of Battery bank respectively.
6	UPS/NOR mode selection Switch	Use to select between UPS or Normal (Inverter) modes.
7	HC/NC Mode Selection Switch	Use to select between High (Fast) Charging or Normal Charging Modes
8	TT/FT Mode Selection Switch*	Use to select between Tall Tubular (TT) or Flat Tubular Battery Modes
9	Input DC Battery MCB**	Used for Protection from Overload and Short Circuit - DC Battery Supply end
10	Manual By-Pass Switch***	Use it to Bypass the UPS & Connect your load directly to AC Mains Supply.

\* For selected models only (settings will come in effect only after the Battery Reset of the UPS)

\*\* For selected models only (5KVA & above)

\*\*\* For selected models only (3.5KVA & above)

### FRONT PANEL (LED/LCD MODEL)



1000



1400

On the front panel of the UPS there is ON/OFF switch and LED/LCD display for indications.

### (FOR LED MODEL)

Graphical Representation	Colour		Status	Meaning
	1000	1400		
Mains	Orange	White	Continuous ON	Mains Available
			Blinking (with beep of buzzer)	Mains Fuse Blown / MCB Trip Fault Protection
Charge	Green	Green	Blinking	Battery Charging
			Continuous ON	Battery Charged
Backup	Orange	Blue	Continuous ON	Backup mode
Low Battery	Red	Orange	Continuous ON (with beep of buzzer)	Battery Low Warning
			Continuous ON (no beep of buzzer)	Battery Low Protection (Reset by front switch or by mains coming)
Over Load / Short Circuit	Red	Red	Blinking (with beep of buzzer)	Over Load Warning
			Continuous ON (no beep of buzzer)	Over Load Protection (Reset by front switch or by mains coming)
			Continuous ON (with beep of buzzer)	Short Circuit Protection

**Warning !** Ignoring the instructions can cause physical injury or death, or damage to the equipment.

- Improper use of these devices, non-observance of the warnings given in this manual and improper tampering with the safety functions can lead to property damage, personal injury, electric shock and, in extreme cases, death.
- Clearly identify the work location. Read the safety instructions of the work area and the component you are working on. See the subsections below and component-specific manuals.
- Disconnect and secure against re-connection. Disconnect all possible power supplies. Lock the dis-connectors in the open position and attach a warning notice to them. After disconnection of the UPS, always wait for 5 minutes to let the intermediate circuit capacitors discharge.
- Protect against any other live parts.
- Take special precautions when close to exposed conductors.
- Check the installation is dead. Always measure to ensure that there is no voltage connected.
- Carry out earthing (grounding) and short circuiting.
- Issue a permit to work

### NON-OBSERVANCE OF THIS USER MANUAL

- Trouble-free and safe operation of this inverter presumes proper, professional and workmanlike transportation, storage, mounting and installation as well as careful operation and thorough maintenance.

### SAFETY INSTRUCTIONS FOR THE UPS COMPARTMENT

**Warning !** Ignoring the instructions can cause physical injury or death, or damage to the equipment.

- Do not expose Pure Sine Wave UPS to any type of chemicals. The Pure Sine Wave UPS is designed for interior only.
- Do not disassemble the Pure Sine Wave UPS take it to a qualified Service Center when service or repair is required. Opening by unqualified personnel can lead to electrical shock or fire hazard.
- To reduce risk of electric shock, disconnect all wiring before cleaning.

## SAFETY INSTRUCTIONS FOR THE UPS COMPARTMENT

- If it is necessary to remove any battery, always remove the grounded terminal from the battery first. Make sure all the accessories are off, so as not to cause arcing.
- Be sure that the area around the battery is well ventilated.
- Clear battery terminals. Be careful not to allow corrosion to come in contact with eyes.
- Study all battery manufacturer's specific precautions and recommended rates of charge.
- Add only distilled water in each cell until battery acid reaches level specified by battery manufacturer. This helps purge excessive gas from cells. Do not overfill. For a battery without caps, carefully follow manufacturer's recharging instructions.

Company is not responsible for any kind of battery related problems.

## AC and DC Wiring Separation :

-Do not mix AC and DC wiring in the same conduit. A separate conduit should be used for each, where DC wiring must cross AC and vice-versa. Make the wires at the crossing point 90 degrees to one another.

**\*It is recommended that wiring should be point to point otherwise warranty will be void.**

## WARM UP

- Secure all the wiring with ties or other non-conductive fasteners to prevent damage.
- Check to see that UPS, front switch in the OFF position.
- Switch ON DC MCB for battery (if any).

**OPERATION :** Once the AC and DC wiring have been installed and connected, take a moment to re-examine all the connections and make sure they are secured and in the proper terminals.

Check to see that the UPS is turned off, and then apply battery (DC) power to it. Ensure that all wiring has been installed properly. It is recommended that wiring should be point to point. Next turn on the battery bank DC, disconnects or connect the proper fuse in line to the battery to complete the battery circuit.

Put ON/OFF switch to the ON position. The UPS should run a load without AC input (battery only). Place a load on the UPS and make sure it works.

To charge your batteries connect AC power to the UPS by plugging in the AC power and turning on the Main line. This shows that charger is working properly. Any AC load powered by the UPS should also work at this point since a portion of the AC power is passed through the UPS to power the loads. The delay before connecting is provided within acceptable frequency and voltage limits.

Disconnect the AC power. The UPS should transfer to backup mode immediately. This will be indicated by a clicking sound as the internal transfer relay changes position. The UPS will begin to take power from batteries and use it.

To Power the load and the load continuous to operate uninterrupted. The above steps will complete a functional test of the UPS if all area pass, the UPS is ready for use, if anything fail, figure out why before proceeding.

## CONCEPT OF CHARGING

### Five State ATM Pulse Charging

**Bulk :** Batteries are charged at maximum allowed continuous constant charging current at constant voltage for speedy charging battery up to 13.6V (For a 12V Battery)

**Boost :** The charger checks the charging current when the battery voltage reaches 13.6V for 12V batteries. The boost mode of the charger will be activated, which will boost the battery up to 20% more than its rated voltage Generally 14.4 V per 12V battery (If battery selection switch is there then 14.5 / 14.7V for Tower / Tall Tub & 14.2V for Flat Tub.) per 12V battery and charging current reduce to 50% of bulk charging (i.e 4 to 5AMP).

**Taper :** When the voltage level of battery is 20% more than its rated voltage, the taper mode of the charger will be activated, which will keep the charging current about 4AMP to achieve the specific gravity of electrolyte for fully charged battery.

**Float :** In float stage, the charger keeps the charging voltage and current level at its trickle charging set point generally 13.7V for 12V battery ; if battery Selector Switch is there then 13.8V for Tower Tub. & 13.5V for Flat Tub. per 12V battery with minimum charging current of 1.0 Amp.

**Pulse (Reset) :** To maintain the float level, the charger resets to zero current at 13.6V for some time and starts again with pulse charging for <1AMP current at same voltage. This keeps the battery in full charge condition even when not in use.

### Special Notice:

The Home UPS charger is for use with nominal battery supply voltage of 12V, 24V.

No AC or DC disconnects are provided as an integral part of this UPS. Both AC and DC disconnects must be provided as part of system installation.

No over current protection for the battery supply is provided as an integral part of this UPS Over current protection for the battery cables must be provided as part of the system installation.

No over current protection for the AC output wiring is provided as an integral part of this UPS. Over current protection for the AC output wiring must be provided as part of the system installation.

**Grounding Instructions:** This UPS must be connected to a grounded, permanent wiring system.

## SALIENT FEATURES

- DSP based Sine Wave Output
- Auto Reset
- Protection Circuit
- State-of-the-art DSP based Technology
- Automatic Low Battery Cutout (LBCO)
- Automatic High Battery Cutout
- Overload Current Cutout
- Battery Type Optimization
- Charge Rate Regulation
- Volts AC Dropout
- Reduces Power Consumption of UPS

## TROUBLESHOOTING

SYMPTOMS		REMEDY / RECTIFICATION
Mains Power is coming. Still UPS shows Mains Fuse Blown/MCB Trip		Reduce / disconnect the load and replace the glass fuse or reset the AC MCB given at rear side of UPS
Back-up mode but no output condition		Check display if low battery power is present. remove all loads and switch the power switch ON/OFF. Allow the battery to charge when the mains is resumed, before running the UPS on battery again.  Check display if overload/short circuit condition is present. Reduce load and switch the power switch ON/OFF.
UPS does not operate & no message on display		Check the battery and incoming grid supply connections.
UPS trips frequently at back-up mode		Reduce the load and reset the UPS
There is not output power	Low Battery	Check condition of batteries and recharge
	Loose or corroded battery connection	Check & Clean all Connections
	Loose AC output Connection	Check all AC output Connections
UPS shuts down after 20 seconds no display at all	Output of UPS is wired back to its own output	Check for proper AC input and output and output wiring
Low Surge Power	Weak batteries, batteries cable too long	Check whether extra cable add on battery wires, if yes then remove that
Unit Overheats	Unit is hot	Reduce Load and let the unit cool down

## GETTING STARTED

### INSTALLING YOUR UPS

#### Step:1

**Environment :** UPS are sophisticated devices and must be treated accordingly. Keep the UPS in non-condensing, well-ventilated environment, ensuring that there is no ingress of moisture of foreign material.

**Location :** UPS should be kept as close as possible to the battery in order to keep the battery cables short, however do not locate the UPS in the same compartment as non-sealed batteries. Batteries generated gases, which are very corrosive to electronic equipment and everything else.

#### Step:2

##### DC Cabling :

-Ensure that the ON/OFF switch on the front panel is in the OFF Position before you begin the installation.

-Connect the positive terminal of the battery bank to the positive (Red) wire of the UPS, it is advised to not to use any other extra cable for batteries other than those supplied By the Company.

-Connect the negative terminal of the battery bank to the negative (Black) wire of the UPS.

##### AC Cabling :

-Connect AC input supply to the Power cord of Home UPS such that the phase is connected to L (Red), neutral is connected to N (Black) and earth is connected to E (Green).

-Connect output load wires to the output socket/terminal of UPS, such that the phase is connected to L (Red), Neutral is connected to N (Black) and earth is connected to E (Green).

## TECHNICAL SPECIFICATIONS

Model	1000	1400
Voltage Range	180 VAC - 265 VAC $\pm$ 5 VAC (UPS Mode) 100 VAC - 280 VAC $\pm$ 15 VAC (NOR Mode)	
Line Low Detection	180V $\pm$ 5V (UPS Mode) / 100V $\pm$ 15V (NOR Mode)	
Line Low Comeback	190V $\pm$ 5V (UPS Mode) / 110V $\pm$ 10V (NOR Mode)	
Line High Detection	265V $\pm$ 5V (UPS Mode) / 280V $\pm$ 15V (NOR Mode)	
Line High Comeback	255V $\pm$ 5V (UPS Mode) / 270V $\pm$ 10V (NOR Mode)	
Frequency Transfer	Input Frequency 45-55 Hz	
<b>Characteristics (AC)</b>		
Inverter Full Load Power	1000VA (800W)	1400VA (1120W)
On-Line Mode	Sine Wave	
Battery Mode	Sine Wave	
On-Line Output voltage	Follow the Line Voltage	
Battery Mode Output Voltage	200 VAC $\pm$ 10%	
Transfer Time (No-Load)	$\leq$ 15 ms	
Frequency at Battery Mode	50 Hz $\pm$ 1 Hz	
<b>Characteristics (DC)</b>		
DC Supply Voltage	12 V	
Battery Boost Charge Voltage	TT Mode : 14.5 VDC $\pm$ 0.2 VDC FT Mode : 14.2 VDC $\pm$ 0.2 VDC	14.4 VDC $\pm$ 0.2 VDC
Battery Floating Charge Voltage	TT Mode : 13.8 VDC $\pm$ 0.2 VDC FT Mode : 13.5 VDC $\pm$ 0.2 VDC	13.5 VDC $\pm$ 0.2 VDC
Max. Charge Current	HC : 18A $\pm$ 1A NC : 15A $\pm$ 1.0A	HC : 24A $\pm$ 1A NC : 17A $\pm$ 1.0A
Battery Voltage Low Alarm	10.6 VDC $\pm$ 0.2 VDC	
Battery Discharge Protection	10.4 VDC $\pm$ 0.2 VDC	

## INSTALLATION DIAGRAM

