

USER'S MANUAL (IFU)

MAK SERIES DIGITAL INVERTER

SU-Kom
powered by innovation

Salient Features

- Micro Controller Based PWM Technology Using MOSFETs.
- FUZZY Logic Control- a Unique and Advanced Technology which Protects the Battery.
- Reduces Frequency of Water Topping and Enhances Battery Life.
- Mains Fuse Blown Sensing Circuit.
- Great Power Saving.
- Soft Start Capability For Starting Heavy Loads.
- Software Controlled Auto Reset Feature for Overload, Short Circuit.
- High and Low Input Voltage Protection for the Connected Appliances.
- User Friendly Graphical Display.

GLOBAL CERTIFICATIONS:

ISO 9001 : 2000
ISO 14001:2004

R&D
Recognised
by
MINISTRY OF SCIENCE & TECHNOLOGY
GOVERNMENT OF INDIA

Before connecting, operating, or adjusting this unit, please read this instruction booklet carefully .

Customer Care : +91 - 11 - 44231111

CONTENT

❁ INTRODUCTION & SAFETY INSTRUCTIONS.....	1
❁ FRONT PANEL.....	2
❁ BACK PANEL & TROUBLE SHOOTING.....	3
❁ TECHNICAL SPECIFICATIONS.....	4

Welcome to **Su-Kam**

Dear Customer,

Congratulations!

We thank you for your trust in Su-Kam products. We take pride in our reputation for product quality and industry proven performance. We are confident that you will be fully satisfied with its performance and that it will serve your power back-up needs. This Digital Inverter has been developed using state-of-the-art Micro controller based technology and FLC (Fuzzy Logic Control) based battery charger.

Su-Kam is committed to continual product improvement and feel the best way to accomplish this task is by listening to our valued customers. This commitment gets strengthened every time you buy a Su-Kam product.

Please read this manual to become familiar with its features and various applications.

IMPORTANT SAFETY INSTRUCTIONS & PRECAUTIONS

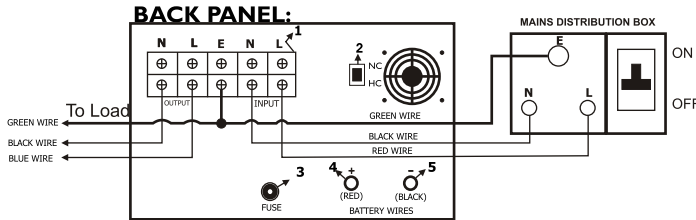
Before proceeding further kindly go through the safety instructions carefully.

1. Before using the Inverter read all instructions and cautionary markings on the Inverter, the Batteries, all appropriate section of this instruction manual.
2. Do not expose Inverter to rain, liquids of any type. The Inverter is designed for interiors only.
3. Do not disassemble the Inverter, take it to a Su-Kam Engineering Service Center when service or repair is required.
4. To reduce risk of electric shock, disconnect all the wiring before cleaning.
5. Do not cover your Inverter with any cover or cloth.
6. Do not install this Inverter on or near flammable materials (plywood, Chemicals, gasoline etc.).
7. Be extra cautious when working with metal tools on and around batteries. It could short-circuit the batteries or other electrical parts, producing a spark that could cause an explosion.
8. Never disconnect the battery cables while the Inverter is working.
9. We recommend that you have point to point wiring of the Inverter.
10. This Inverter must be connected to a proper earth, permanent wiring system.

FRONT VIEW:

On the front panel of the digital Inverter there is one Power Active switch and a graphical symbol panel, for indications.

1. **MAINS ON** : It's indicate that incoming mains is available display glow continuously. If mains fuse blown then display blinking with buzzer beep.
2. **INV. ON** : It's indicate that incoming mains is not available and the output is from Battery.
3. **BATT. CHARGING / CHARGED** : This white graphical glows intermittently during charging and glows continuously when battery is charged.
4. **O.L. / SHORT CIRCUIT** : This graphical symbol, shows that either Short circuit has occurred or there is overload on the Battery mode. The Digital Inverter resets itself automatically and makes 8 attempts in case of overload and 4 attempts in case of short circuit. During overload or short circuit this graphical symbol glows and the buzzer gives a intermittent beeps.
5. **LOW BATT.** : Inverter will shut down automatically after a few minutes. During this stage the graphical symbol glows and the buzzer gives continuous beep. Your battery is discharged.
6. **POWER ACTIVE SWITCH** : The ON/OFF switch in the front is to be pressed inside to ensure that the Inverter switch on in the event of mains failure and connected load is run by Inverter.



Warning: Product may get damaged if not connected as per wiring diagram.

TROUBLE SHOOTING

Symptoms	Rectifications
Main power is coming. Inverter shows mains fuse blown on its display panel.	Reduce the load and replace or reset the fuse of specified ratings given at rear side of the inverter.
No power during backup mode.	(1) Check if low battery graphic symbol is glowing, switch OFF the inverter by power active switch. Allow the battery to charge when the mains is resumed before running the Inverter on battery again.
Inverter does not operate.	(2) Check if overload/short circuit graphic symbol is glowing. Reduce load and reset the Inverter by Power Active switch.
Inverter trips frequently at backup mode.	Check the battery connections and the mains connections
	Reduce the load and restart Inverter through Power Active Switch.

Symptoms	Problem	Remedy
There is no output power	(1) Low Battery.	Check condition of batteries and recharge.
	(2) Loose or corroded batt. Connections.	Check and clean all connections.
	(3) Loose AC output connection.	Check all AC output connections.
System shuts down after 20 sec no display at all	Output of inverter is wired back to its own input.	Check for proper AC input and output wiring.
Low/High AC output voltage	Measuring with the wrong type Voltmeter.	Meter must be a true RMS reading meter.
Low surge power	Weak batteries, battery cable too long.	Refer to cable and battery recommendations in this manual.

*Back Panel
& Trouble
Shooting
(3)*

TECHNICAL SPECIFICATIONS

MODEL	MAK	MAK	MAK
CAPACITY	650VA/12V	850VA/12V	1500VA/24V

MAINS MODE

Mains A.C. Range	105 - 285V \pm 10V
Mains Output Frequency	Same as Input (45 - 55 Hz)
Battery Charging Range	140 - 285V
Battery Charging Current (NC Mode)	9.0 \pm 1.0 Amp.
Battery Charging Current (HC Mode)	13.0 \pm 1.0 Amp.

BATTERY MODE

Output Voltage	200 - 230V \pm 25V
Output Frequency	50.0 Hz. \pm 0.1 Hz
Battery Boost Voltage	13.9V \pm 0.2V each Battery
Battery Float Voltage	13.6V \pm 0.2V each Battery
Battery Lower Voltage Limit	10.2V \pm 0.2V each Battery (Depending on Load)
Overload	Above 110%
Short Circuit Protection	>250% Load (Few msec)

Dimension (W XDX H) in mm	272 x 275 x 122	272 x 275 x 122	395 x 306 x 168
Weight(Kg)	8.3	9.3	17.2
Recommended Battery Capacity	100Ah - 200Ah		

SU-KAM OFFICES ADDRESSES

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PKG-ML- 156