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5KVA - 10KVA Online UPS

Uninterruptible Power Supply

User's Manual



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Please comply with all warnings and operating instructions in this manual strictly. Save this manual properly and read carefully the following instructions before installing the unit. Do not operate this unit before reading through all safety information and operating instructions carefully.

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1. SAFETY AND EMC INSTRUCTIONS

Please read carefully the following user manual and the safety instructions before installing the unit or using the unit!

1-1. Transportation and Storage



Please transport the UPS system only in the original package to protect against shock and impact.



The UPS must be stored in the room where it is ventilated and dry.

1-2. Preparation



Condensation may occur if the UPS system is moved directly from cold to warm environment. The UPS system must be absolutely dry before being installed. Please allow at least two hours for the UPS system to acclimate the environment.



Do not install the UPS system near water or in moist environments.



Do not install the UPS system where it would be exposed to direct sunlight or nearby heater. Do not



block ventilation holes in the UPS housing.

1-3. Installation



Do not connect appliances or devices which would overload the UPS (e.g. big motor-type equipment) to the UPS output sockets or terminal.



Place cables in such a way that no one can step on or trip over them.



Do not block air vents in the housing of UPS. The UPS must be installed in a location with good ventilation. Ensure enough space on each side for ventilation.



UPS has provided earthed terminal, in the final installed system configuration, equipotential earth bonding to the external UPS battery cabinets.



The UPS can be installed only by qualified maintenance personnel.



An appropriate disconnect device as short-circuit backup protection should be provided in the building wiring installation.



An integral single emergency switching device which prevents further supply to the load by the UPS in any mode of operation should be provided in the building wiring installation.



Connect the earth before connecting to the building wiring terminal.



Installation and Wiring must be performed in accordance with the local electrical laws and regulations.

1-4. Operation



Do not disconnect the earth conductor cable on the UPS or the building wiring terminals in anytime since this would cancel the protective earth of the UPS system and of all connected loads.



The UPS system features its own, internal current source (batteries). The UPS output sockets or output terminal blocks may be electrically live even if the UPS system is not connected to the building wiring outlet.



In order to fully disconnect the UPS system, first press the “OFF” button and then disconnect the mains.



Ensure that no liquid or other foreign objects can enter into the UPS system. The



UPS can be operated by any individuals with no previous experience.

1-5. Standards

* Safety	
IEC/EN 62040-1	
* EMI	
Conducted Emission	Category C3
Radiated Emission	Category C3
*EMS	
ESD.....	Level 4
RS.....	Level 3
EFT	Level 4
SURGE.....	Level 4
CS.....	Level 3
Power-frequency Magnetic field	Level 4
Low Frequency Signals..... :IEC/EN 61000-2-2	
Warning: This is a product for commercial and industrial application in the second environment-installation restrictions or additional measures may be needed to prevent disturbances.	

2. INSTALLATION AND OPERATION

2-1. Unpacking and Inspection

Unpack the package and check the package contents. The shipping package contains:

- One UPS
- One user manual (Download on official website)
- One RS-232 cable (optional)
- Battery interconnection links (optional)
- Input Output Cables (optional)

NOTE: Before installation, please inspect the unit. Be sure that nothing inside the package is damaged during transportation. Do not turn on the unit and notify the carrier and dealer immediately if there is any damage or lacking of some parts. Please keep the original package in a safe place for future use.

2-2. Inner Front Panel View

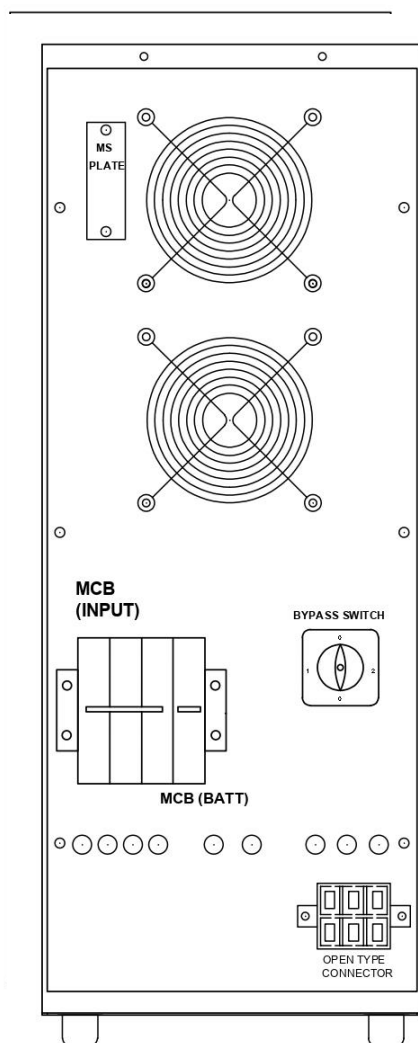


Diagram1: 5KVA (B)/40KVA (B) inner Front Panel

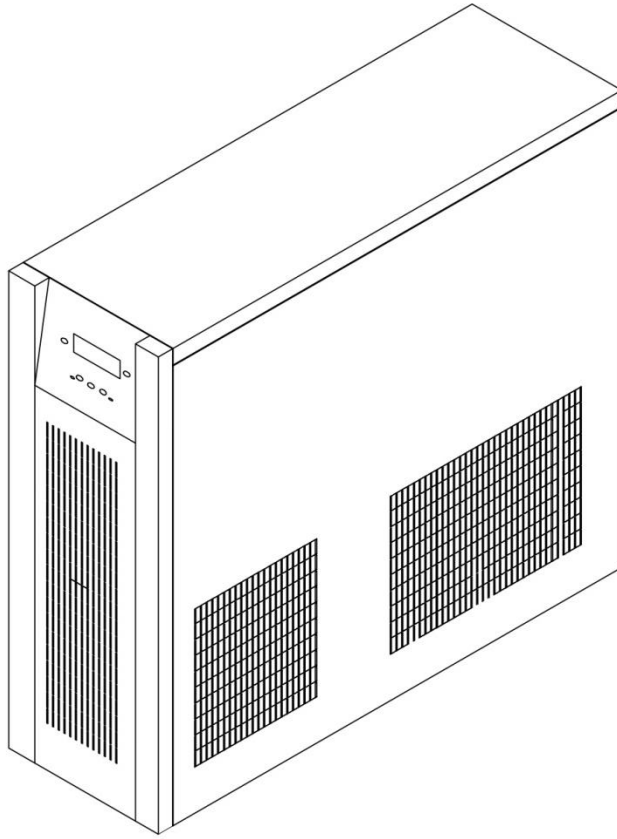


Diagram 3: 5KVA/40KVA ISO View

2-3. UPS Installation

Installation and wiring must be performed in accordance with the local electric laws/regulations and execute the following instructions by professional personnel.

1) Make sure the mains wire and breakers in the building are in compliance with the standard of rated capacity of UPS to avoid the hazards of electric shock or fire.

NOTE: Do not use the wall receptacle as the input power source for the UPS, as its rated current is less than the UPS's maximum input current. Otherwise the receptacle may be burned and destroyed.

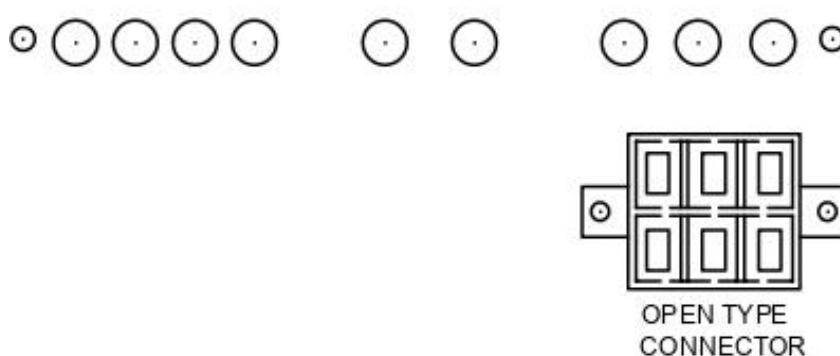
2) Switch off the mains switch in the building before installation.

3) Turn off all the connected devices before connecting to the UPS.

4) Prepare wires based on the following table:

UPS rating	Battery cable Rating			Input Cables Rating	Output Cable rating
KVA	96 VDC	120 VDC	192 VDC	P+N	P+N
5	16SQMM	-	-	4 SQMM	4 SQMM
7.5	-	35SQMM	16SQMM	10 SQMM	10 SQMM
10	-	35SQMM	16SQMM	16 SQMM	16 SQMM

5) Open the front door panel of UPS. Then connect the wires according to the following terminal block diagrams: (Connect the earth wire first when making wire connection. Disconnect the earth wire last when making wire disconnection!)



Terminal Block wiring diagram

NOTE 1: Make sure that the wires are connected tightly with the terminals.

NOTE 2: Please install the output breaker between the output terminal and the load, and the breaker should be qualified with leakage current protective function if necessary.



Warning: (Only for standard model)

- Make sure the UPS is not turned on before installation. The UPS should not be turned on during wiring connection.
- Do not try to modify the standard model to the long-run model. Particularly, do not try to connect the standard internal battery to the external battery. The battery type and voltage and numbers may be different. If you connect them together, it maybe causes the hazard of electric shock or fire!



Warning: (Only for long-run model)

- Make sure a DC breaker or other protection device between UPS and external battery pack is installed. If not, please install it carefully. Switch off the battery breaker before installation.



Warning:

- For standard battery pack, there are one DC breaker to disconnect the battery pack and the UPS. But for other external battery pack, make sure a DC breaker or other protection device between UPS and external battery pack is installed. If not, please install it carefully. Switch off the battery breaker before installation.

NOTE: Set the battery pack breaker in “OFF” position and then install the battery pack.

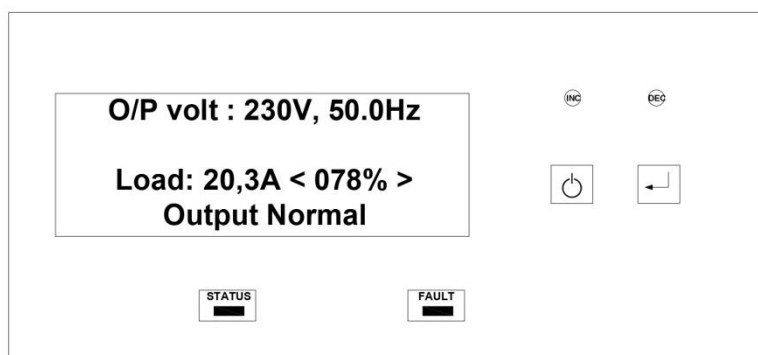
- Pay highly attention to the rated battery voltage marked on the rear panel. If you want to change the numbers of the battery pack, please make sure you modify the setting simultaneously. The connection with wrong battery voltage may cause permanent damage of the UPS. Make sure the voltage of the battery pack is correct.
- Pay highly attention to the polarity marking on external battery terminal block, and make sure the correct battery polarity is connected. Wrong connection may cause permanent damage of the UPS.
- Make sure the protective earth ground wiring is correct. The current spec, color, position, connection and conductance reliability of wire should be checked carefully.
- Make sure the utility input & output wiring is correct. The current spec, color, position, connection and conductance reliability of wire should be checked carefully. Make sure the L/N terminal is correct, not reverse or short-circuited.

3. OPERATIONS

3-1. Button Operation

Button	Function
ENTER	➤ Enter Key: Press this button to confirm the selection in setting menu.
ON / OFF	➤ Turn ON & OFF the UPS Inverter Section
INC	➤ Increment parameter in setting
DEC	➤ Decrement parameter in setting

3-2. LED Indicators and LCD Panel



LED Indicators:

There are 2 LEDs on front panel to show the UPS working status:

Green Continuous Glow → UPS ON Load on Mains.

Green Flashing → UPS ON Load on Battery.

Red Flashing → Any Fault Warning condition. (Ex- O/L, B/L, High Temperature)

Red Continuous Glow → UPS Tripped (B/L, O/L, O/P Low, O/P high, O/T)

Fault Parameters :

O/L Warning, B/L Warning, O/L Trip, B/L Trip, O/P Low, O/P High, I/P Low, I/P High, Temperature Warning, High Temperature

LCD display Parameter:

Sr. No.	Parameter
1	Input voltage
2	Battery voltage
3	Battery current
4	Output voltage
5	Output current
6	Output connected load
7	Power factor
8	Output frequency
9	Load On Battery

3-3. UPS Operation

1. Turn on the UPS with utility power supply (in AC mode)

- 1) After power supply is connected correctly, set the breaker of the battery pack at “ON” position (the step only available for long-run model). Then set the input breaker at “ON” position. At this time the fan is running and the UPS supplies power to the loads via the bypass. The UPS is operating in Bypass mode.

NOTE: When UPS is in Bypass mode, the output voltage will directly power from utility after you switch on the input breaker. In Bypass mode, the load is not protected by UPS. To protect your precious devices, you should turn on the UPS. Refer to next step.

- 2) Press and hold the “ON” button for 0.5s to turn on the UPS .
- 3) A few seconds later, the UPS will enter to AC mode. If the utility power is abnormal, the UPS will operate in Battery mode without interruption.

NOTE: When the UPS is running out battery, it will shut down automatically at Battery mode. When the utility power is restored, the UPS will auto restart in AC mode.

2. Turn on the UPS without utility power supply (in Battery mode)

- 1) Make sure that the breaker of the battery pack is at “ON” position (only for long-run model).
- 2) Press and hold the “ON” button for 0.5s to turn on the UPS, and the buzzer will beep once.
- 3) A few seconds later, the UPS will be turned on and enter to Battery mode.

3. Connect devices to UPS

After the UPS is turned on, you can connect devices to the UPS.

- 1) Turn on the UPS first and then switch on the devices one by one, the LCD panel will display total load level.
- 2) If it is necessary to connect the inductive loads such as a printer, the in-rush current should be calculated carefully to see if it meets the capacity of the UPS, because the power consumption of this kind of loads is too big.
- 3) If the UPS is overload, the buzzer will beep twice every second.

- 4) When the UPS is overload, please remove some loads immediately. It is recommended to have the total loads connected to the UPS less than 80% of its nominal power capacity to prevent overload for system safety.
- 5) If the overload time is over acceptable time listed in spec at AC mode, the UPS will automatically transfer to Bypass mode. After the overload is removed, it will return to AC mode. If the overload time is over acceptable time listed in spec at Battery mode, the UPS will become fault status. At this time, if bypass is enabled, the UPS will power to the load via bypass. If bypass function is disabled or the input power is not within bypass acceptable range, it will cut off output directly.

4. Charge the batteries

- 1) After the UPS is connected to the utility power, the charger will charge the batteries automatically except in Battery mode or during battery self-test.
- 2) Suggest to charge batteries at least 10 hours before use. Otherwise, the backup time may be shorter than expected time.
- 3) Make sure the battery numbers setting on the control board (Please refer to the section 3-4-12 for detailed setting) is consistent to real connection.
- 4) The charging current can be changed from 0.5A to 6A via LCD or software. Please make sure that the charging current is suitable to battery specification.

5. Battery mode operation

- 1) When the UPS is in Battery mode, the buzzer will beep according to different battery capacity. If the battery capacity is more than 25%, the buzzer will beep once every 4 seconds; If the battery voltage drops to the alarm level, the buzzer will beep quickly (once every sec) to remind users that the battery is at low level and the UPS will shut down automatically soon. Users could switch off some non-critical loads to disable the shutdown alarm and prolong the backup time. If there is no more load to be switched off at that time, you have to shut down all loads as soon as possible to protect the devices or save data. Otherwise, there is a risk of data loss or load failure.
- 2) In Battery mode, if buzzer sound annoys, users can press the Mute button to disable the buzzer.
- 3) The backup time of the long-run model depends on the external battery capacity.
- 4) The backup time may vary from different environment temperature and load type.
- 5) When setting backup time for 16.5 hours (default value from LCD panel), after discharging 16.5 hours, UPS will shut down automatically to protect the battery. This battery discharge protection can be enabled or disabled through LCD panel control. (Refer to 3-7 LCD setting section)

6. Turn off the UPS with utility power supply in AC mode

- 1) Turn off the inverter of the UPS by pressing "OFF" button for at least 0.5s, and then the buzzer will beep once. The UPS will turn into Bypass mode.

NOTE 1: If the UPS has been set to enable the bypass output, it will bypass voltage from utility power to output sockets and terminal even though you have turned off the UPS (inverter).

NOTE 2: After turning off the UPS, please be aware that the UPS is working at Bypass mode and there is risk of power loss for connected devices.

- 2) In Bypass mode, output voltage of the UPS is still present. In order to cut off the output, switch off the input breaker. A few seconds later, there is no display shown on the display panel and UPS is complete off.

7. Turn off the UPS without utility power supply in Battery mode

- 1) Turn off the UPS by pressing "OFF" button for at least 0.5s, and then the buzzer will beep once.
- 2) Then UPS will cut off power to output and there is no display shown on the display panel.

8. Operation in warning status

- 1) When Fault LED flashes and the buzzer beeps once every second, it means that there are some problems for UPS operation. Users can get the fault code from LCD panel.
- 2) Some warning alarms can't be muted unless the error is fixed. Please refer to section 3-3 for the details.

9. Operation in Fault mode

- 1) When Fault LED illuminates and the buzzer beeps continuously, it means that there is a fatal error in the UPS. Users can get the fault code from display panel.
- 2) Please check the loads, wiring, and ventilation, utility, battery and so on after the fault occurs. Don't try to turn on the UPS again before solving the problems. If the problems can't be fixed, please contact the distributor or service people immediately.
- 3) For emergency case, please cut off the connection from utility, external battery, and output immediately to avoid more risk or danger.

10. Operation of changing battery numbers

- 1) This operation is only available for professional or qualified technicians.
- 2) Turn off the UPS. If the load couldn't be cut off, you should remove the cover of maintenance bypass switch on the rear panel and turn the maintenance switch to "BPS" position first.
- 3) Switch off the input breaker, and switch off the battery breaker (only available for long-run model), or disconnect battery wire for standard model.
- 4) Modify the battery pack for the setting number carefully. After complete it, put the cover back, and switch on the battery breaker for long-run model.
- 5) Switch on the input breaker and the UPS will enter Bypass mode. If the UPS is in maintenance Bypass mode, turn the maintenance switch to "UPS" position and then turn on the UPS.

4. STORAGE AND MAINTENANCE

4-1. Storage

Before storing, charge the UPS at least 7 hours. Store the UPS covered and upright in a cool, dry location. During storage, recharge the battery in accordance with the following table:

Storage Temperature	Recharge Frequency	Charging Duration
-25°C - 40°C	Every 3 months	1-2 hours
40°C - 45°C	Every 2 months	1-2 hours

5-2. Maintenance



The UPS system operates with hazardous voltages. Repairs may be carried out only by qualified maintenance personnel.



Even after the unit is disconnected from the mains, components inside the UPS system are still connected to the battery packs which are potentially dangerous.



Before carrying out any kind of service and/or maintenance, disconnect the batteries and verify that no current is present and no hazardous voltage exists in the terminals of high capability capacitor such as BUS-capacitors.



Only persons are adequately familiar with batteries and with the required precautionary measures may replace batteries and supervise operations. Unauthorized persons must be kept well away from the batteries.



Verify that no voltage between the battery terminals and the ground is present before maintenance or repair. In this product, the battery circuit is not isolated from the input voltage. Hazardous voltages may occur between the battery terminals and the ground.



Batteries may cause electric shock and have a high short-circuit current. Please remove all wristwatches, rings and other metal personal objects before maintenance or repair, and only use tools with insulated grips and handles for maintaining or repairing.



When replace the batteries, install the same number and same type of batteries.



Do not attempt to dispose of batteries by burning them. This could cause battery explosion. The batteries must be rightly disposed according to local regulation.



Do not open or destroy batteries. Escaping electrolyte can cause injury to the skin and eyes. It may be toxic.



Please replace the fuse only with the same type and amperage in order to avoid fire hazards.



Do not disassemble the UPS system.

5. SPECIFICATIONS

TECHNOLOGY		Double conversion with the latest MPWM technology using AG PFC 101 5KVA-10KVA			
MODEL		AG PFC101, Solar compatible.			
RATING		1Ø Input - 1Ø Output			
CAPACITY		5KVA / 10KVA			
DC BUS		5KVA	6KVA	7.5KVA	10KVA
INPUT					
Input Voltage		230VAC, 1Ø			
Input Voltage Window		170VAC - 270VAC			
Input Frequency		50Hz ± 10%			
Power walk in		Soft start for 0-20 seconds power walk-in.			
Input PFC		0.99 on full load			
Input current harmonic distortion(THDi)		<7% @100 % Load			
RECTIFIER					
Voltage Regulation		(±) 1%			
Ripple Voltage		<2% without Battery			
BATTERY-		SMF			
Charger Type		CCCV			
Charging Current Standard		0-10A			
INVERTER					
Inverter Type		IGBT based MPWM with instantaneous Sinewave Control			
Power Factor		0.8 lag			
Nominal Voltage		230V/50Hz			
Regulation		(±) 1%			
Total Harmonic Distortion	Linear Load	<2%			
	Non Linear Load	<4%			
Over Load Capacity		125% -1 Minute : 150% 10 Seconds			
Transient Response		Output remains within +/- 5% & recover to normal within 20 msec			
Bypass		Auto bypass			
EFFICIENCY					
Efficiency- 100 % load		>85% - 90%			
Crest Factor		3:1			
Mode of Operation		Designed for Continuous operation			
ISOLATION		True Online with complete galvanic isolation for comprehensive power protection			
LCD Display shows the following parameters		• Input Voltage • Output Voltage • Load percentage • Output Frequency • Battery Voltage			
Fault status display with latch		• Mains on • Charger on • Inverter on • Battery Low •Overload • Inverter Trip			
PROTECTIONS		• Advanced Electronic Protection for device safety, backed up with MCB's/ MCCBs & fast acting fuses			
		• High speed pulse by pulse electronic device protection • Electronic over current trip with reset.			
		• Input Under Voltage / Over Voltage • Rectifier Over Voltage			
		• Over Temperature • Over load • Battery low • Short circuit • High voltage transient protection & ESD protection as per IEC 62040-2			
ALARMS		• Input low/ fail • Output Overload • Over Temperature • Battery low			
Enclosure Protection		IP-20			
Cooling		Forced air			
Acoustic Noise level		<60db @ 1.5 meter			
Operating ambient Temperature		0 to 40 ° C			
Humidity		Up to 95% RH Non condensing			
Dimensions in mm D x H x W/ Wt. in Kg		550* 550* 200 / 45kgs 550* 550* 200 / 50kgs 550* 550* 200 / 55kgs 600* 650* 240 / 70kgs			
Altitude		< 3000 Feet above sea level (without derating)			
TESTING STANDARD		As per IEC 62040-3			



POWER SOLUTIONS

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We Also Manufacture – Online UPS, Static Voltage Stabilizers, Isolation Transformer, Battery charger, frequency converters, static switch & customized power supplies.



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