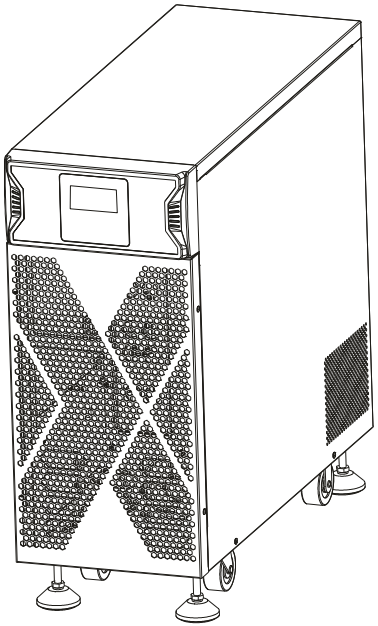
INTEGRITY MAX L/T UPS Line



NPTU2000-O-N
NPTU3000-O-N

Table of Contents

1. Safety Instructions and Storage/ Battery Care

SAVE THESE INSTRUCTIONS - This manual contains important instructions that should be followed during installation and maintenance of the UPS and batteries.

Read the instructions carefully to become familiar with the equipment before starting to install.
Notify the carrier and dealer if there is any damage.

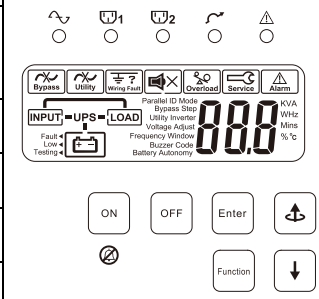
- Adhere to all national and local electrical codes.
- Always check that the supply source voltage is same as the UPS operating voltage
- This UPS is intended for indoor use only.
- Do not operate this UPS in direct sunlight, in contact with fluids, or where there is excessive dust or humidity.
- Be sure the air vents on the UPS are not blocked. Allow adequate space for proper ventilation. Keep rear panel 20cm from wall or any obstructions.
- For a UPS with a factory installed power cord, connect the UPS power cable directly to a wall outlet. Do not use surge protectors or extension cords.
- The battery typically lasts for two to five years. Environmental factors impact battery life. Elevated ambient temperatures, poor quality utility power, and frequent short duration discharges will shorten battery life.
- The equipment and batteries are heavy. Remove the batteries before installing the UPS and practice safe lifting techniques adequate for the weight of the equipment.
- Before installing or servicing the equipment check that the Disconnecting from the AC mains and load. The UPS contains internal batteries and may present a shock hazard even when disconnected from the branch circuit (mains).
- Doing wiring, maintenance service and batteries replacement should be performed or supervised by personnel knowledgeable about batteries and the required precautions.
- When replacing batteries, replace with the same type and number of batteries or battery packs.
- CAUTION: Do not dispose of batteries by burning them. The batteries may explode.
- CAUTION: Do not open or mutilate batteries. Released electrolyte is harmful to the skin and eyes, and may be toxic.
- CAUTION: A battery can present a risk of electrical shock and high short-circuit current through conductive materials could cause severe burns. The following precautions should be observed when working on batteries:
  - Before installing or replacing the batteries, remove jewelry such as wristwatches and rings, or other metal objects.
  - When working on batteries should wear rubber gloves and boots. Also, must use tools with insulated handles, and do not lay tools or metal parts on top of batteries.
  - Remove battery grounds during installation and maintenance to reduce likelihood of shock.
  - Remove the connection from ground if any part of the battery is determined to be grounded.
- External battery cabinet installation instructions, please refer to Battery Bank Installation User's MANUAL

2. UPS Functional Descriptions

2.1 Front Panel Display

2.1.1 Tower < Convertible Type (Rack / Tower)> LCD panel

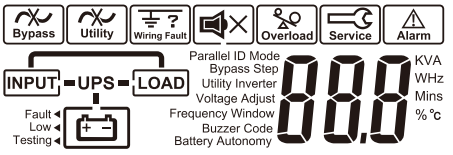
LCD Panel	
Symbol	**Description**
ON	UPS On/Alarm Silence
OFF	UPS OFF Switch
Function	Special functions log in/out
Enter	To re-confirm the change of UPS Setting
↓	Go to next page
↑	Go to previous page or change the setting of the UPS.
∿	Green LED steadily lights up to indicate that the Utility input voltage is within the window. (In standby mode: 90Vac~150Vac) (In Line mode: 55Vac~150Vac)
⏦1 ⏦2	Green LED lights up to indicate there is an output available at the Programmable Outlet 1 & Programmable Outlet 2.
↷	Amber LED lights up to indicate the Bypass Input is normal.
⚠	UPS Fault LED



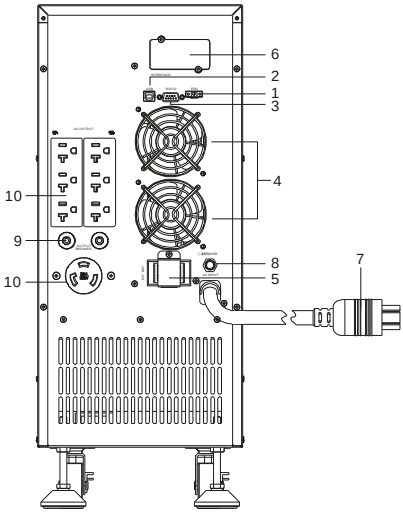
◎ Manual Bypass： press "ON ON-KEY" and "↑ Up-KEY" key simultaneously for approx. 3 seconds to transfer from "Inverter to Bypass" (the bypass led continuously “blink“ and the buzzer will beep intermediately or "Bypass to Inverter")

2.1.2 LCD display description

LCD Panel	
Sign	**Description**
Wiring Fault	Site Wiring Fault
Buzzer Silent	Buzzer Silent
Overload	UPS Overloading
Service	UPS Working in specified mode*
Alarm	UPS Fault or Abnormal Warning
INPUT UPS LOAD	UPS Flow Chart
888 KVA WHz Mins % ℃	3-Digit Measurement Display
	Indicates the item to be measured
Fault ◀	Battery Abnormal
Low ◀	Battery Low
Testing ◀	Testing



2.2 Rear Panel



1. Emergency Power Off (EPO) / Remote ON/OFF (ROO) Dry contact signal inputs
2. USB port
3. RS-232 port
4. Fan
5. External battery connector
6. Slot for optional communication cards*
7. AC power connection socket
8. Utility input circuit breaker
9. Output circuit breaker for two outlets
10. AC outlets(Program Relay)

* Remark: Optional function

2.3 Communication Port Explanation
The UPS is equipped with a true RS-232 communication port as standard to provide communication with bundled UPS monitoring software for remote monitoring of the UPS status using a PC.

You may use optional interfaces cards for R2E (RS-232), RSE (RS-485), USE (second USB), DCE (Dry Contact), and SNMP. However, the R2E card, RSE card and USE card must not be used simultaneously.

When the optional interface cards are used together with the onboard USB port the EPO signals will get highest priority, then the SNMP/WEB card, then the shutdown command at the DCE, R2E, RSE, and USE cards, and then finally the onboard USB port gets the lowest priority.

2.3.1 EPO/ROO
Pin Assignments:

Function setting :

1. EPO NC → Shutdown UPS (default)
2. EPO NO → Shutdown UPS
3. ROO NC → Start-up UPS
4. ROO NO → Start-up UPS

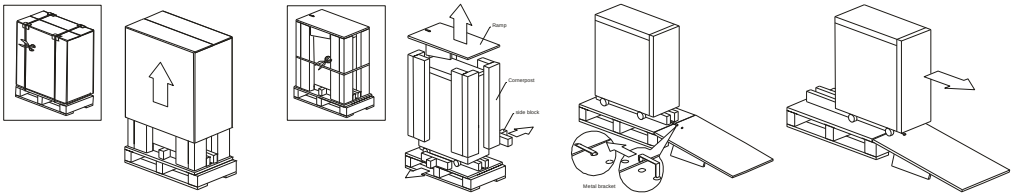
(this function setting by setting tool)

3. Installation and Operation
Please read the Safety Instruction guide (pages 2) before installing the UPS.

3.1 Unpacking
Inspect the UPS upon receipt. The packaging is robust, but accidents and damage may still occur during shipment. Notify the forwarder and dealer if there is damage.

The packaging is recyclable and reusable.
1. The UPS is heavy. Always practice safe lifting techniques adequate for the weight of the equipment. Remove the packing and the plastic cover before lifting the UPS out of the box.

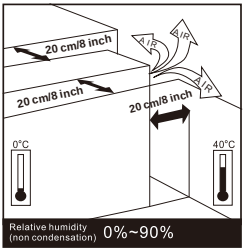
Step1 Step2 Step3 Step4



2. The standard package also consist of the following items:
   A. User Manual
   B. USB Cable

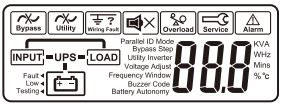
3.2 Selecting Installation Position
The UPS is heavy. Select a location sturdy enough to support the UPS weight.
To ensure proper operation and long operating life, position the UPS according to the following requirements.

1. Keep at least 20 cm (8 inches) side and rear clearance away from walls or any obstructions.
2. Ensure the air vents on UPS are not blocked. Allow adequate space for proper ventilation.
3. Ensure that the installation site is free from excessive dust and the ambient temperature and humidity are within the specified limits.
4. Do not place the UPS in a dusty or corrosive environment or near any flammable objects.
5. This UPS is not designed for outdoor use.



3.3 Operation

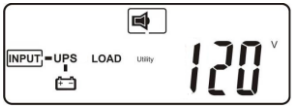
3.3.1 LCD Panel



Line mode start up

1. Please ensure the outlet of power source is proper grounded.
2. Ensure the voltage rating of power source is matched with UPS spec.
3. Plug in UPS to the AC source
4. UPS will start initializing after AC input power is available 5 seconds. LED/LCD indicator will be all lit and dim once and fan will start spinning. Full LCD display looks as below figure:

   Press UPS [ON] button and hold untill twice beep heard, UPS begins starting procedures for 5 seconds. LCD display will show as below figure-A and then figure-B sequentially. When you see figure-B means the starting up procedure is finished

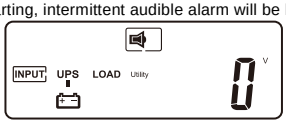


A

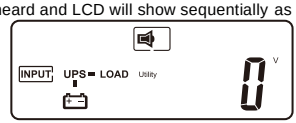
B

Start-up in Battery Mode (Cold Start)

1. Ensure the internal battery is available or external battery set well connected to UPS. Press and hold [ON] key for 3 seconds until twice beeps heard, release button and press [ON] for 3 seconds until twice beeps heard again to confirm cold start procedure. If the 2nd button confirmation not be finished within 10 seconds after 1st twice beeps, UPS will not cold start and shut off after 10 seconds.
2. 5 seconds after cold starting, intermittent audible alarm will be heard and LCD will show sequentially as below figure-D and figure-E.



D

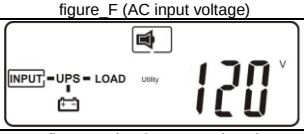
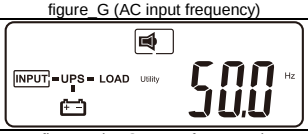
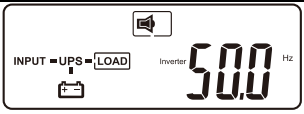


E

Note: Ensure that the UPS batteries are pre-charged for at least four hours by simply connecting the AC power cord to the utility receptacle.

Operation of measurements display

UPS measurements can be checked after UPS started by pressing select key [↓]. The display sequence are as below figure-F~M.

figure_F (AC input voltage)	figure_G (AC input frequency)
	
figure_H (UPS output voltage)	figure_I (UPS output frequency)
	
figure-J (UPS loading percentage)	figure-K (UPS output current)

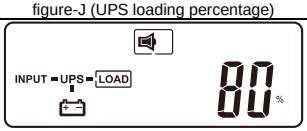
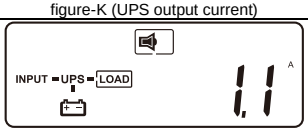
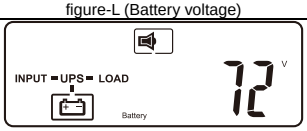
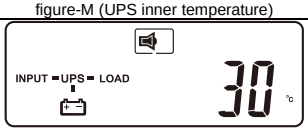

	

figure-L (Battery voltage)	figure-M (UPS inner temperature)
	

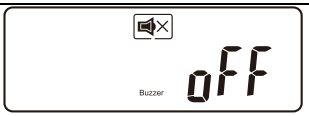
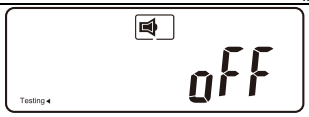
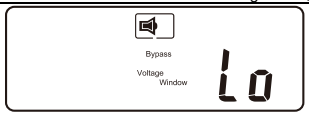
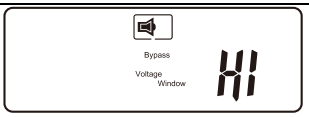
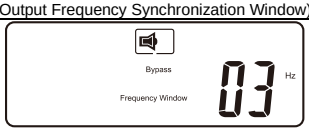
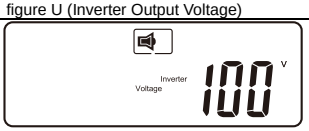
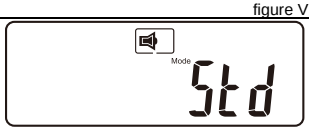
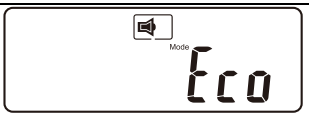
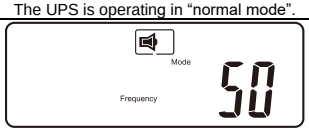
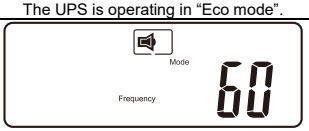
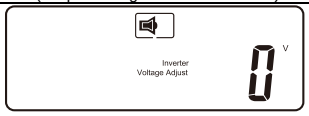
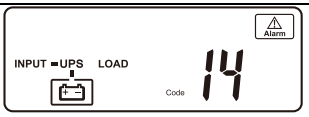
UPS Locked up

UPS UPS will locked up when encountering abnormal or failure condition. Refer to the LCD display as shown below figure-N.

The procedures to release UPS from locked up status as below:
(a) Check and record the error code.
(b) Check user's manual to understand possible cause, solve the problem or call service provider.
(c) Press OFF key [OFF] and hold for 5 seconds until twice beep heard.
(d) Unplug AC input power cord or turn off power source switch.
(e) After UPS completely shut off, UPS is unlocked.

UPS Default Data and Special Function Execution

After the UPS completely starts up, press the [Function] key to change the LCD display to figure Q1. Press the [↓] key to scroll through the UPS setting pages. The LCD will display in sequence figure Q1~W.

figure Q1,2 (buzzer)			
Q1	 Buzzer "On"	**Q2**	 Buzzer "Off"
figure R1,2 (Self-test)			
R1	 Self-test is not "On".	**R2**	 Self-test is "On".
figure S1,2 (Bypass Voltage Windows)			
S1	 Bypass Voltage is adjusted to wide range.	**S2**	 Bypass Voltage is adjusted to narrow range.
figureT (Output Frequency Synchronization Window)		figure U (Inverter Output Voltage)	
T	 Frequency Window is +/-3 Hz.	**U**	 Inverter output voltage
figure V1~4 (UPS Operation Mode)			
V1	 The UPS is operating in "normal mode".	**V2**	 The UPS is operating in "Eco mode".
V3	 The UPS is operating in "CVCF 50 Hz mode".	**V4**	 The UPS is operating in "CVCF 60 Hz mode".
figure W (Output Voltage Micro Tune Value)			
W	 Output Voltage Adjustment (-6.0V ~ +6.0V)	**N**	

3.3.2 UPS Default Settings and their alternatives

Make sure the UPS is not "On". Press the on [ON] and scroll down [↓] keys simultaneously for approximately three seconds. The buzzer will sound twice, and the LCD will display figure Q1, indicating that the UPS is in setting mode.

To scroll through the options refer to section 0

Except for Buzzer (figures Q1 and Q2) and Self-test (figures R1 and R2) all of the other default settings may be changed by pressing the scroll up key.

Figures S1 and S2 indicate the bypass input acceptable window. It follows the inverter output voltage. (i)Bypass Sensitivity Low: many selectable output voltages±15% and (ii)Bypass Sensitivity High: many selectable output voltages±10%.

Figure T indicates the bypass frequency window of the Inverter Output. The acceptable setting values are ±3 Hz and ±1 Hz.

Figure U indicates the acceptable Inverter Output Voltage. Possible values are 100, 110 or 120 VAC.

Figures V1, V2, V3 and V4 indicate the operation modes of the UPS. Possible values are Online, Eco (Economical) mode, fixed 50 Hz Output, and fixed 60 Hz Output.

Figure W indicates the adjustment of the Inverter Output, which may be set to -6.0V ~ +6.0V.

After changing settings you must scroll to the "End" screen and then press the enter key to save all of your changes.

* Press the Enter key to save changes.

Turn off the Utility Input breaker.

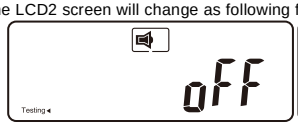
Your setting changes are now complete.

Turn UPS off

1. Line mode(AC input available) : Press Off key and hold until twice beeps heard, UPS output will shut off. UPS will stay in standby mode, fan(s) keep spinning and battery will be remained recharging if AC input still available after output is off, otherwise it will be shutdown completely.
2. Backup mode (AC input not available): Press Off key and hold until twice beeps heard, UPS output will shut off. 10 seconds later, fan stop spinning and UPS shutdown completely.

Self-Test (Line mode only)

This function is for checking battery capacity of battery pack in AC mode. It will perform backup mode test for 10 seconds after receiving self-test command by front panel. You can press Function key, next page key and then previous page key to perform the 10 seconds self-test. The LCD2 screen will change as following figures.



3.3.3 Beep Codes

The following table contains common UPS statuses with their beep codes.

UPS Status	Beep Code
UPS faulty, Inverter shut down. All functions inhibited.	Long Continuous Beep
Control keypad error	Long Continuous Beep
UPS faulty, loads continue to be supplied via Inverter or Bypass.	Single beep every two seconds
In battery mode	Single beep once per second
Battery low	Quick and short successive beeps
Confirm RS-232 port receiving	two quick and short beeps
Service mode okay	one quick and short beep

4. UPS System Block Diagram

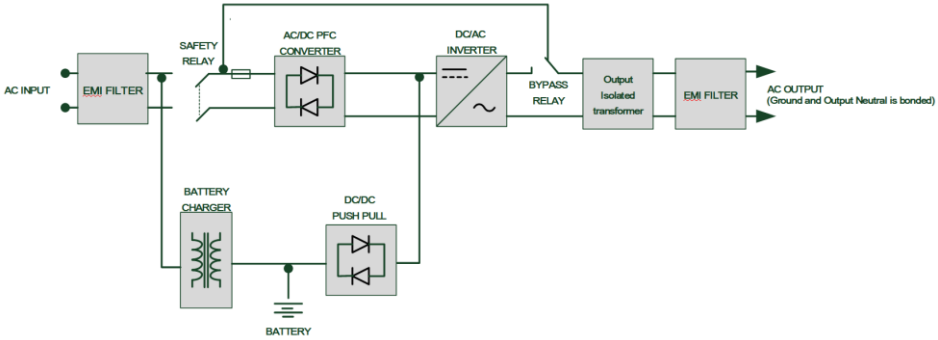


Figure 4.1

Figure 4.1 illustrates the True On-Line Double Conversion architecture of the UPS system. The major modules consist of:

1) An AC-to-DC power converter (rectifier) with PFC control circuit
2) A DC-to-AC high frequency inverter
3) An intelligent battery charger
4) A bank of stationary, maintenance-free batteries
5) A DC-to-DC push/pull converter control circuit
6) A static bypass loop
7) Output Isolated transformer
8) Input and output EMI filters

5. Maintenance Guide

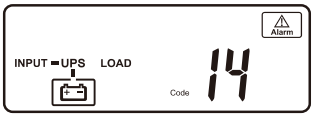
5.1 Troubleshooting

If the UPS malfunctions during operation please check that all lines are connected properly and that the utility specifications are correct. Refer to the table below to troubleshoot. Should the problem persist please contact your local dealer for assistance.

Situation	Check Items	Solution
Fault ⚠ LED Read the error code (see next page) displayed by the combination of LEDs, and verify the fault as follows.	1. Er05,Er39	1. Check the battery connection. Measure battery voltage to ensure that batteries are charged and healthy. Recharge batteries for 8 hours if necessary. Simulate utility outage to verify that UPS is able to provide DC backup. Otherwise consult your local dealer right away.
	2. Overload	2. Disconnect some non-critical loads from the UPS output until the overload ceases. Check if there is any short circuit between cables due to broken cable insulation. Replace the cables if necessary.
	3. Er11 (UPS Over Temperature)	3. Remove any objects obstructing the ventilation louvers. Verify that the cooling fans are working properly. Contact your local dealer to replace the fans if necessary.
	4. Site wiring/Ground fault	4. Check if the "L" and "N" phases of the utility AC source have been wrongly wired or if the Ground-Neutral voltage exceeds the limits.
	5. Er14 (Fans out of order)	5. Verify that the ventilating fans are functioning properly. Do not attempt to replace the fans yourself. Contact your local dealer for replacement.
	6. Other error codes	6. Consult your local dealer for assistance.
UPS fails to provide battery backup or its backup time is shorter than its intended performance.		If the backup time remains unsatisfactory after 8 hours of charging please contact your local dealer for battery replacement.
UPS is normal, but there is no output to the load.	Check that all power cords are properly connected.	If the problem persists consult your local dealer for technical assistance.
The UPS switches into battery mode and then back into utility mode when a connected device is turned on, or the UPS switches back and forth between battery and utility modes.	A power strip is connected to the UPS. See if there is any damage to the utility wall receptacle or if the cord plug is faulty.	1. Do not use the power strip. 2. Replace the wall receptacle/cord plug.
Strange noise or smell		Shut down the whole system immediately. Disconnect the power from the UPS and contact your local dealer.
UPS is unable to provide backup power.		Check that the battery connectors are fully engaged. Allow the batteries to recharge if they are weak. If the problem persists after recharging the batteries, consult your local dealer for assistance.

Checking error code on LCD panel：

If UPS is in abnormal condition，common alarm sign ⚠ will light up and come with audible alarm. The LCD screen will shows information of alternate normal and error code. You can follow section 5 and 5.2 up for troubleshooting.



5.2 Error Codes and Their Meanings

Code	Meaning
Er05	Battery weak or faulty
Er06	Output short-circuited
Er07	EPO mode
Er11	UPS over-temperature
Er12	Inverter overload
Er14	Fan errors
Er39	When UPS start process, Utility Voltage less than 90V and Battery no connection.
Er28	Bypass overload

5.3 Maintenance

1. Clean the dust from the ventilation openings and intakes on the rear panel.
2. Turn off the UPS and wipe the casing with a damp cloth. Be careful to avoid getting water in the UPS.
3. Periodically unplug the power cord of the UPS from the wall receptacle to test the condition of the batteries. Be sure you have saved your data in any open computer applications before you proceed with this battery test.

6. Communication Software

6.1 Hardware Setup

1. Connect to either RS-232 communication or USB communication.
2. Connect a male RS-232 connector or a USB cable* to the UPS communication port. Connect the female RS-232 connector or the other end of the USB cable to the computer.

***Note: RS-232 and USB cables are optional.**

6.2 Software Installation

Please refer to the software user's manual.

7. Specifications Convertible Type

	Model name		NPTU2000-O-N	NPTU3000-O-N
Capacity	VA / W		1920VA / 1728W	2700VA / 2430W
	Power Factor		0.9	
	Battery Number		6	
Input	Voltage Rating		55-150 V_{AC} (90-150 V_{AC}: 0 ~ 100% Load / 75-90 V_{AC}: 0 ~ 75% Load / 50-75 V_{AC}: 0 ~ 60% Load)	
	Frequency Rating		44-66 Hz (Auto Sensing)	
	Phase		Single phase with ground	
	Power Factor		≧ 0.98 (Nominal voltage for 100% linear load)	
	Total Harmonic Distortion		I_{THD} < 7% (Nominal voltage with <1% V_{THD} for 100% linear load)	
	Input Connection		NEMA 5-30P	
Output	Output Voltage		120V_{AC} / 110V_{AC} / 100V_{AC} *120V_{AC} : 1920VA / 1728W *110V_{AC} : 1760VA / 1584W *100V_{AC} : 1600VA / 1440W	120V_{AC} / 110V_{AC} / 100V_{AC} *120V_{AC} : 2700VA / 2430W *110V_{AC} : 2475VA / 2227W *100V_{AC} : 2250VA / 2025W
	Voltage Regulation		within ± 2% until low-battery warning	
	Frequency (Synchronized Range)		3 Hz or 1 Hz (selectable)	
	Frequency (Battery Mode)		50/60 Hz ±0.1	
	Current Crest Ratio		3:1	
	Total Harmonic Distortion		Linear Load: V_{THD} ≦ 3% PF=0.9 Non-Linear Load: V_{THD} ≦ 6% PF=0.7 Non-Linear Load: V_{THD} ≦ 12%	
	Output Waveform		Pure sine wave	
	Outlets		(3+3) NEMA 5-20R (programmable) + NEMA L5-30R	
Battery	Battery Number		6	
	Battery Voltage		72 V_{DC}	
	Battery Type		12V_{DC} lead-acid battery (Selected and Installed by customer)	
	Charging Current	Standard	1.4A ± 0.2A (@120V_{AC} Input)	
	Recharge time		90% ≤ 6 hours,	
Protection	Full Protection		Output Over Load, Output Over Voltage & Output Low Voltage, Over Temperature, Output Short circuit, Utility Surge Protection, EPO, Site Wiring Fault, Over Discharge	
DC start			Yes	
Self diagnostics			Upon Power-on, Front Panel Setting & Software Control, 24 hours routine check	

Physical	Dimensions (W x H x D)	inches	8.9 x 22 x 22.8
		mm	227 x 560 x 580
	Weight	lbs	67.4(without Battery) / 101.3(with Battery)
		kg	30.6 (without Battery) / 46(with Battery)
Audible Alarm	Battery Mode		Sounds once every 1.5 seconds (Sounds once every 0.2 seconds for low-voltage battery alarm)
	General Alarm		Sounds once every 3 seconds
	Overload		Continuously Sounds
	Fault		Continuously Sounds
Front Panel	LCD (Standard)		Normal, Battery, Bypass, Self-Test, Battery Weak & Bad, Site Wiring Fault , Fault, Overload, and Load/Battery Level
	Button		ON / OFF / Enter / Function / Up / Down
Environmental	Operating Temperature		Operating: 0ºC ~ 40ºC (32ºF to 104ºF) / Storage: -10ºC ~ 50ºC (14ºF to 122ºF)
	Noise Level (100% Load)		Line Mode (Battery Full Charged) ≤ 55dBA ; Backup Mode ≤ 65dBA at 1 meter from front of unit
	Relative Humidity		0-90% (without condensation)
Interface	Standard		RS-232, USB, EPO
	Option		2nd RS232, USB, EPO/ROO, Dry Contact Relay, SNMP/WEB Card,
	Compatible Platforms		Microsoft Windows series, Linux, Mac, etc.
Standards and Certifications	Safety		UL 1778
	FCC		FCC Part15 Class A
	Markings		UL, cUL

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