

LEVELUPS

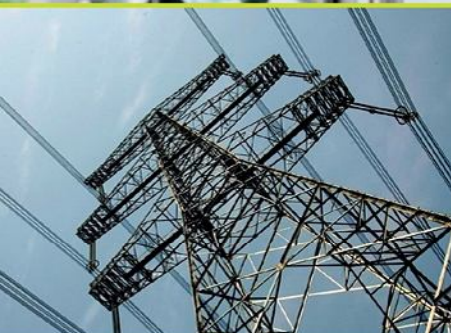
Series

**THREE LEVEL
ONLINE UPS
10-800kVA**
Three Phase / Three Phase

96%
Efficiency
at half load

Three Level Rectifier &
Inverter Technology
Ultra High Energy Efficiency

real source of power



- True Three Level Rectifier & Inverter Technology
- Output Power Factor 1 (kVA=KW)
- On Line-Double Conversion Technology (Class VFI-SS-111)
- IGBT PWM Rectifier & Inverter Technology
- DSP Control
- Ultra High Efficiency up to 96%
- Low Input Current THD (<3%)
- High Input Power Factor (>0.99)
- Dual Input
- Optional DC/DC Charger/Booster
- Wide Input Voltage Range (Optional)
- Advanced Battery Management
- Short Circuit and Overload Protection
- Paralellable Modules up to 8 units
- 500 Real Time Event Log with Detailed Parameters
- Static&Manual Bypass Operation
- Overload and Short Circuit Protection
- Small Footprint and Easy Maintenance
- Advanced Communication Capabilities
- Perfect Generator Compatibility

10kVA • 15kVA • 20kVA • 30kVA • 40kVA • 60kVA • 80kVA • 100kVA • 120kVA • 160kVA • 200kVA • 250kVA • 300kVA • 400kVA • 500kVA • 600kVA • 800kVA

Greater Power Higher Efficiency

LevelUps Series uninterruptible power supply (UPS) with Innovative 3 Level Technology is a true on-line double conversion, three-phase UPS system that provides one of the highest level energy efficiencies in the industry.

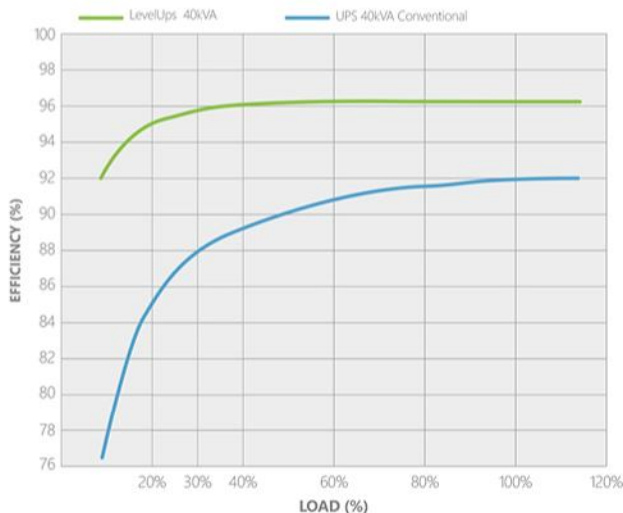
Three Level UPS Series

With its latest Three level inverter & rectifier design LevelUps Series brings the newest power conversion technology and delivers efficiency up to 96% at 50-75% load operation which is the most common operating range. This ultra high system efficiency provides considerable cost savings in comparison to the traditional transformerless Ups's with 93% efficiency.

High Efficiency & Low Total Cost of Ownership

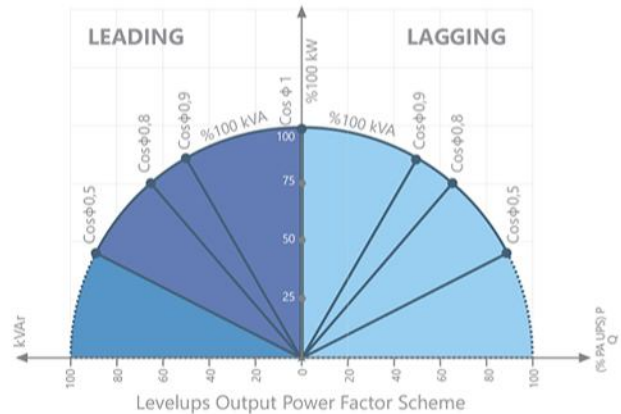
LevelUps Series consumes less energy to supply the loads thanks to its high efficiency up to 96%. High Efficiency rate provides ;

- Reduced energy loss
- Reduced electricity usage and air conditioning requirements
- Reduction in operating cost of Ups



High Output Power Factor 1

Output Power factor of 1 (kVA=kW) rate provides up to 25% more active power than a traditional UPS. Suitable for modern power supply application with unit or capacitive power factor (e.g. new servers generation) without any reduction in active power from 1 leading to 1 lagging.



DSP Power Factor Corrected IGBT Rectifier

IGBT based power factor correction technology provides Input Power Factor close to 1 (≥ 0.99) and keeps Input Current Total Harmonic Distortion (THDi) less than 3%, that helps to avoid the disturbance.

Digital Control System

All of the control functions for LevelUps Series UPS including power-on, start-up control, input stage power factor control, battery charging and boosting control, output stage ac voltage regulation and shut-down control, can be realized by using a single DSP control board.

Low Input Current THD

(THDi) less than 3% avoids the disturbance to connected loads.

High Input Power Factor

0.99 Input power factor ensures clean and sinusoidal input current. The high input power leads to reduced electricity pay-out, minimizes cable, switchboard, fuse and generator requirements, thus reducing investment cost.

Dual Input Operation

LevelUps Series can operate with either single or dual power inputs. Dual Input feature increases availability by allowing UPS to be connected to two separate power sources. In dual configuration the rectifier is fed from utility (main source) and the static and maintenance by-pass are fed from a secondary source.

Advanced Battery Management

LevelUps Series guarantees enhanced battery life and maximizes battery performance, life span and reliability through intelligent precision charging. Temperature Compensated Battery Charging monitors performing measurement of external and internal battery temperature and adjusting the charge current rate accordingly.

Advanced battery management provides real-time information about battery capacity and back up time, this information can be seen on LCD panel. The Ups tests the batteries at adjustable periods without switching off the system, the test periods can be set by users.

EPO (Emergency Power Off)

EPO function is designed to switch off the UPS in emergency conditions (fire, flood, etc.). The system will turn off the rectifier, inverter and will stop powering the load immediately (including the inverter and bypass) also the battery stops charging or discharging.

Static & Manual (Maintenance) Bypass

LevelUps Series includes standard static and manual bypass. Static bypass provides safe failure to mains if the UPS is overloaded or develops a fault condition. Where EMI filters are used to help to neutralize spikes and electrical noise, the load may be routed through bypass to provide further protection. Manual bypass function is intended only for maintenance work, this bypass supply is incorporated into the LevelUps design. Manual bypass is used to power down the UPS without interrupting the power to the load. With this feature it is completely safe for the technical personnel to work on the faulty UPS.

Auto Restart

When the main and bypass sources fail, the UPS draws power from the battery system to supply the load until the batteries are depleted. When UPS will reach its end of discharge, it will shut down. The UPS will automatically restart and enable output power:

- After utility power is restored
- After the "Auto Start Delay Time" is expired (the default delay is 5 minutes).

Perfect Generator Compatibility

LevelUps Series is perfectly compatible with diverse sources, especially with generators. When generator power is used, thanks to its robust IGBT rectifier, it ensures clean, uninterrupted power to protected equipment. With high input power factor performance of LevelUps series it is enough to choose generator with power only %20 higher rated than the UPS. LevelUps Series has the ability to adjust power walk-in from 5 to 15 seconds, along with reduced input current distortion.

Reverse Energy Tolerance for Regenerative Loads

LevelUps can be used with regenerative loads, such as synchronous motors. The regenerative loads pump the energy back to mains, traditional Ups systems burn this feedback energy and this causes lower efficiency. LevelUps Series Ups with IGBT rectifier are able to absorb intermittent load generated power. Additionally, this reverse power tolerance permits execution of important system operations like closed transition transfers of the UPS load directly to an engine generator source.

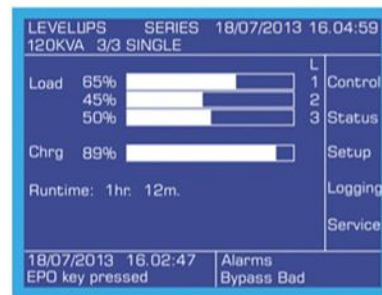
Flexibility

LevelUps is compatible with wide range of application. Flexibility achieved through many choices, including type of battery, single or multi-unit configuration, accessories and options.

- Frequency converter mode
- Optional temperature sensor for external battery cabinets (to assist the recharge voltage compensation)
- Additional battery chargers to optimize charge time
- Separated bypass
- Optional backfeed protection
- Isolation transformers to vary neutral connectivity in the event of separate power sources or for galvanic isolation between input and output
- Battery cabinets of different sizes and capacities, for providing extended runtimes.

Advanced User Interface

LevelUps has Large and user-friendly 320x240 touch panel LCD display that provides operating information in four different languages. Thanks to this advanced touch panel LCD display all parameters of working device can be monitored and controlled. UPS is capable of recording up to 500 events.



Parallel Operation

LevelUps Series features easy and simple scalability and redundancy. It is ready to grow with your business demands. Different power rated units and any number of UPS can be connected in parallel.

Power Increase: The UPS's can be connected in parallel to increase total capacity of the system. If one of the devices goes out of order, the critical loads are transferred to by-pass.

Parallel Operation Features :

- Internal standard parallel microprocessor for all models.
- Up to 8 units paralleable
- Parallel connection with ring cable
- Optional Loop BUS connection
- Autosensing disconnected parallel cable
- Equal current share with DSP control
- Easy power upgrade without any interruption
- All parallel systems can be controlled from the front panel of one unit
- Full synchronization of parallel units
- Isolated parallel operation card
- Static by-pass for all units



MODEL																		
Capacity	10kVA	15kVA	20kVA	30kVA	40kVA	60kVA	80kVA	100kVA	120kVA	160kVA	200kVA	250kVA	300kVA	400kVA	500kVA	600kVA	800kVA	
Power Watt	10kW	15kW	20kW	30kW	40kW	60kW	80kW	100kW	120kW	160kW	180kW	225kW	270kW	360kW	450kW	540kW	720kW	
INPUT																		
Input Voltage Range	220/380VAC -15% +18% 3P+N+PE Optional 220/380VAC -37% +22% 3P+N+PE																	
Input Power Factor	At Full Load >0.99																	
Input Frequency Range	45 - 65 Hz (Selectable)																	
Rectifier	IGBT																	
Total Harmonic Distortion (THDi)	<3%																	
OUTPUT																		
Output Voltage Range	220 / 380VAC, 230 / 400VAC and 240/ 415VAC 3P+N ±1% Static,																	
Recovery	0% - 100% - 0% Load, Maximum Output Tolerance 5%, 1% Back to Band <40ms																	
Efficiency	96%, Eco Mode 98%																	
Output Frequency Range	50Hz ±0.5% Synchronous With the Network / 50Hz ±0.2% Battery Mode																	
THD (THDv)	Lineer Load <2% Non-Linear Load <5%																	
Crest Factor (CF)	3:1																	
Overload Capacity*	At 125% Load 10min, at 150% Load 1min																	
BATTERY																		
Quantity (12V DC VRLA)	2x31																	
Charge Value (C)	Nominal 0,1 C, Adjustable																	
Battery Power	25% of The Device Power																	
Internal Battery	64 x 7Ah or 9Ah								Not Available									
COMMUNICATION																		
Communication Port	RS232 Standart, RS485 and SNMP Adapter Option																	
Dry Contact	Optional																	
Protocol	SEC, TELNET																	
STANDARDS																		
Quality	ISO 9001 - ISO 14001 - ISO 18001																	
Performance	EN62040 -3 (VFI-SS-111)																	
EMC/LVD	EN62040 - 2 / EN62040 -1 EN60950																	
GENERAL																		
Running Temperature	For UPS 0°C~40°C For Battery 0°C~25°C																	
Storage Temperature	For UPS 15°C ~45°C For Batteries -10°C~60°C																	
Protection Class	IP20																	
Chassis	Anti-Static Paint Protection																	
Humidity	0-95%																	
Altitude	<1000m, Correction Factor 1. <2000m, Correction Factor >0.92, <3000m; Correction Factor >0.84																	
Alerts	500 Event Log.																	
Parallel Operation	Parallel Power Increase up to 8pcs.																	
EPO (Emergency Power Off)	Standard																	
Isolation Transformer	Optional																	
Net Weight (kg)	100	100	107	118	125	260	270	350	355	450	485	650	700	850	1350	1400	1850	
Dimensions (WxDxH) (mm)	490 x 805 x 1190				763x771x1555			810x820x1705			830 x 870 x 1800			1480 x 850 x 1790			1830 x 863 x 1904 x 2010 x 1904	

*under certain conditions

3 Phase in / 1 Phase Out Version is Available. (10 to 30kVA)

Makelsan reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on Makelsan products previously or subsequently sold. Makelsan does not guarantee the items of the accuracy and completeness.