

MASTERLINE SERIES

THREE-PHASE UPS

From 60 to 200 kVA / kW





MASTERLINE SERIES

Compact, high performance three phase power protection with excellent efficiency and scalable runtime for any type of it load, tertiary application, lighting or bulding and other business critical applications.

The Multiline Series UPS brings the latest power conversion technology to the marketplace, using a three level design with a multi mode architecture with latest generation components. These UPS aim to be functional, safe, easy to install and use.



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| <ul style="list-style-type: none"> Three Level Technology Output Power Factor 1 (kVA=kW) On Line-Double Conversion Technology (Class VFI-SS-111) IGBT PWM Rectifier & Inverter Technology Multi Processor Digital Control High Efficiency up to 96% Higher efficiency with eco-mode (up to 98%) Low Input Current THD ($\leq 3\%$) High Input Power Factor (> 0.99) Low output voltage THD ($\leq 2\%$) Short response time ($\leq 2\text{ms}$) Automatic soft-start Cold start Dual Input Advanced Battery Management | <ul style="list-style-type: none"> • DC/DC Charger/Booster • Flexible battery count • Wide Input Voltage Range • Variable input low voltage depending on loading percentage (up to -36%) • Short Circuit, Overload, Lightning and Surge Protection • Parallellable Modules up to 8 units • Intelligent redundancy management (n, n+1 and n+x) • 256 Real Time Event Log with Detailed Parameters • Static & Manual Bypass Operation • Small Footprint and Easy Maintenance • Data analyzing over user interface • Advanced Communication Capabilities • Remote monitoring and management software • Perfect Generator Compatibility • Programmable dry contacts |
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COMPLETE, COST EFFECTIVE SOLUTION

- Online double conversion mode with an real full power, according to IEC 62040: kW=kVA (unity power factor design) means 25% more active power available compared to legacy UPS.
- Dual input mains allow you to manage independent power sources.
- Increased system availability placing UPS in parallel for N+1 and N+X redundancy.
 - Internal manual bypass for easy maintenance without power interruption.
 - Up to 8 pcs parallelable.
 - Multi language big LCD display.

TAILORED TO YOUR ENVIRONMENT

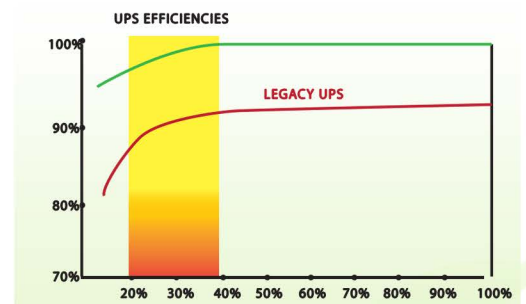
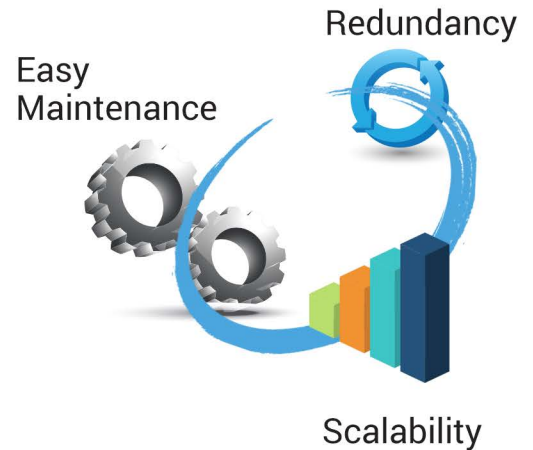
- Low noise level and higher fan life time with intelligent fan speed control.
 - Flexible battery solutions.
- Compact, lightweight and easy to install.
 - Frequency converter mode.
- Extended battery life with exclusive battery charging management for increased battery life.
 - Adjustable battery quantity.

LOWEST TOTAL COST OF OWNERSHIP

- Thanks to three level inverter design and a multi mode architecture that makes real time decisions between premium protection mode and premium efficiency mode brings efficiency up to 96% at 50% online load operation.
 - 10% saving on energy losses compared to legacy UPS gives significant savings in energy. Significant reduction in energy loss.
 - Reduced energy usage, air conditioning requirements and cooling operating costs.
- Energy Saver mode for global efficiency improvement on parallel systems.
 - Up to 35 percent smaller than similar competitive solutions.
 - Saves space with a reduced footprint.

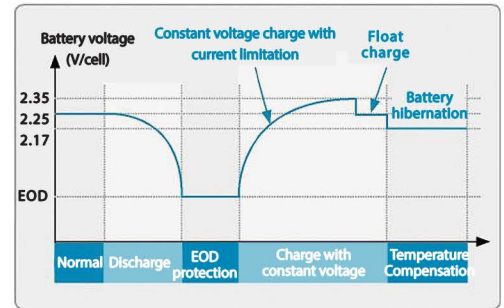
EASY MAINTENANCE

- Built-in manual bypass to eliminate maintenance related downtime.
 - Proactive detection of fan failure and switch fault for early diagnosis on UPS malfunction.
- Plug and play card design to simplify the maintenance process.
 - Easy service by the help of modular power board concept.
 - MTTR is less than 30 minutes.
- Lower spareparts cost by using common boards for different ratings.



INTELLIGENT BATTERY MANAGEMENT SYSTEM

- Thanks to intelligent battery management system increase 35% battery life and maximizes battery performance, life time and reliability through intelligent charging.
- Temperature compensated battery charging monitors performing measurement of external and internal battery temperature and adjusting the charge current rate accordingly.
- Intelligent battery management system can sustain battery lifespan and the capacity of battery backed up through the functions of;
 - Monitoring & compensation battery remaining capacity displayed in percentage.
 - Overcharge/discharge protection.
 - Auto/manual battery test.
- Adjustable 40-46 battery units in one battery cabinet optimizes investment.
 - Three charging modes ensure maximum battery availability:
 - Constant current charging provides maximum rated current to the battery until the voltage rises to a pre-determined limit. A boost voltage is provided for a short term to reduce the battery recharge interval. Float charging maintains the battery at the recommend voltage. Adjustable battery charging time due to the level of the load to save from energy cost.



HIGH PERFORMANCE RECTIFIER CLEAN INPUT PERFORMANCE

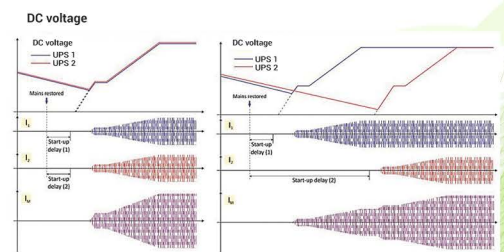
Thanks to the technology used, UPS solves installation problems in systems where the power supply has limited installed power, where the UPS is also powered by a generator or where there are compatibility problems with loads that generate harmonic currents; UPS has zero impact on its power source, being either the mains power supply or a generator. IGBT based rectifier and innovative control algorithm ensures an input Total Harmonic Distortion (THDi) of less than 3% and draws a pure sinusoidal waveform from the mains. This also provides UPS input power factor of 0.99.

Advantages;

- Saving in the sizing of upfront equipment e.g. emergency generators, cablings and circuit breakers.
 - No disturbances to nearby equipment; eliminate perturbation and outage on upfront electrical equipment, avoiding also any investigation and analysis cost due to malfunction
- In addition, UPS plays a filter and power factor correction role in the power network upstream of the UPS, as it eliminates harmonic components and the reactive power generated by the powered utilities.

PROGRAMMABLE SOFT START

Start up delay function, to restart the rectifiers when mains power is restored if there are several UPS in the system. The programmable soft start allows the rectifier to ramp up in a programmable time period (0-15 seconds) thus eliminating in-rush current. This feature reduces the need of oversizing the input power system (gensets, feeder cables, and over current devices).



DC voltage and AC current behaviour using the same value for delay time DC voltage and AC current behaviour using different values for delay time

PERFECT GENERATOR COMPATIBILITY

User programmable features such as slew rate, phase angle rate of change and voltage rate of change allow the UPS to quickly sync to a genset during emergency back. Thanks to its robust IGBT rectifier it is enough to choose generator with power only 20% higher rated than the UPS.

HIGH GRID ADAPTABILITY

- 138-485 Vac wide input voltage range to minimize battery use: 485-305Vac for 100% load; 305-138 Vac for 100%-40% load (derating linearly)
- 6 kV/5 kA lightning protection design, reducing lightning related failure rate.

OUTPUT PERFORMANCE

High Output Power factor 1 = Real Power (kW)

Real full power, according to IEC 62040: Output power factor of 1 (kW=kVA) rate provides 25% more active power compared to traditional UPS. Suitable for latest generation of servers (leading or unity power factor) without any reduction in active power from 1 leading to 1 lagging. Suitable also for leading power factor loads down to 0.9 without apparent power derating.

TOTAL HARMONIC DISTORTION (THD)

A distorted output voltage waveform affects the proper function of the load's equipment. The Masterline Series has very low output voltage THD, even with connected 100% unbalanced or 100% non-linear loads.

TRANSIENT RESPONSE

Transient response is very fast due to control algorithms which reduces the need to oversize the UPS for pulse load applications.

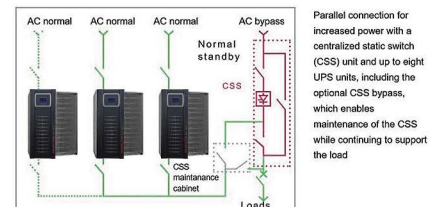
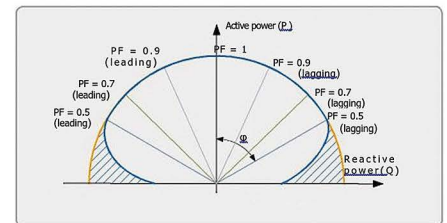
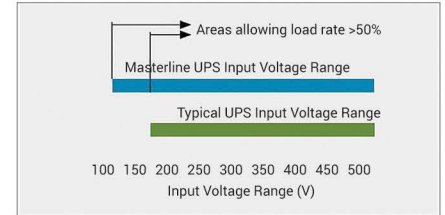
REDUNDANT PARALLEL FEATURES

Thanks to unique control technology that can parallel UPS modules with true redundancy by eliminating any single point of failure. RPA provides a scalable paralleling technique that reduces operating footprint and increases system reliability by eliminating the need for external paralleling equipment and cabinets (centralized bypass and master control). One of the UPS modules in the system intelligently takes the leadership role, while the other UPS modules have access to all control parameters. If one UPS fails to operate, the load is automatically redistributed among the others. If the lead UPS fails to operate, then another UPS automatically

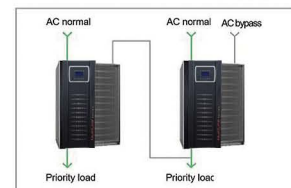
takes on the leadership role.

Parallel Operation Features;

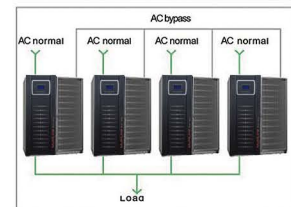
- Parallel connection with ring cable.
 - Sequential Soft Start.
 - Loop bus connection.
 - Distributed Control Logic.
- Autosensing disconnected parallel cable.
 - Redundant Communication.
- Easy power update without any interruption.
 - Full synchronization of parallel units.
 - Isolated parallel operation card.
 - Static bypass for all units.
 - No Single Points of Failure.



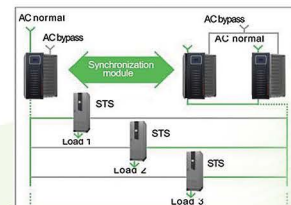
Parallel connection for increased power with a centralized static switch (CSS) unit and up to eight UPS units, including the optional CSS bypass, which enables maintenance of the CSS while continuing to support the load.



Live standby redundancy



Distributed parallel connection for increased power and redundancy



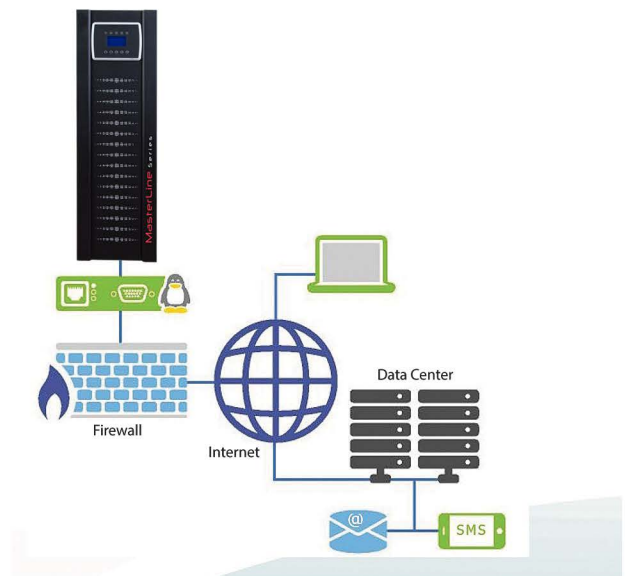
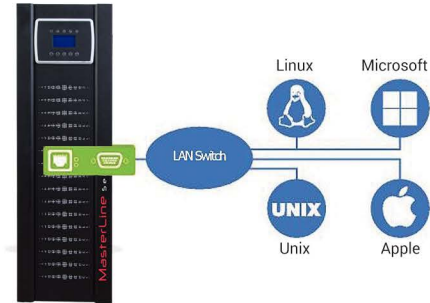
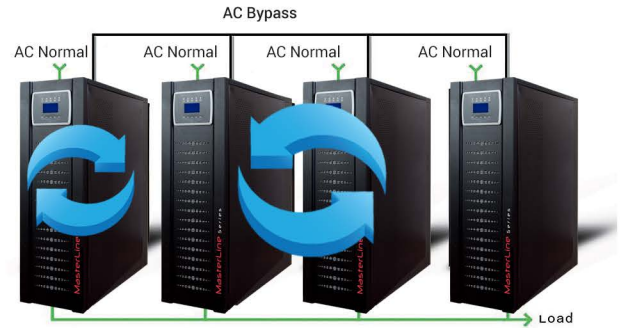
Distribution redundancy with the static transfer switch

SELF LOAD POWER TEST

Only 4% incremental energy consumption. Full power test of Rectifier, Inverter, Bypass, Chokes, Capacitors, Cables and Fuses. Customer load safely supplied through maintenance bypass dummy load free.

SOFTWARE & CONNECTIVITY SOLUTIONS

- Local communication with RS232 and RS485.
 - 2pcs configurable input contact.
 - Relay board with alarms.
 - GenSet contact.
 - EPO contact.
 - USB.
 - Remote Monitoring Panel.
- Battery Temperature Sensor for Temperature Compensated Charging.
 - JBUS, PROFIBUS Local connection.
 - SNMP IT Manager monitoring.
- Environment sensors for Data Centers (Humidity, Temperature, Smoke, etc.).
 - GSM, Telnet, GPRS communication.
 - PC & Server shutdown.
 - Web page remote monitoring.
 - Building management system.
 - E-mail alarm reporting.
 - Remote monitoring 24/7 T.Service.



Masterline Series

3 Ph version 400V (380-400-415V)		MSL 33060	MSL 33080	MSL 33100	MSL 33120	MSL 33160	MSL 33200
Nominal power (kVA)		60	80	100	120	160	200
Active power (kW)		60	80	100	120	160	200
3 Ph version 208V (200-208-220V)		MSU 33030	MSU 33040	MSU 33050	MSU 33060	MSU 33080	MSU 33100
Nominal power (kVA)		30	40	50	60	80	100
Active power (kW)		30	40	50	60	80	100
General Specs							
Technology	Three Level On-Line double conversion VFI-111						
Waveform	Sinusoidal						
Architecture	Stand Alone or Distributed Parallel up to 8 units						
Input Characteristics							
Input Voltage	380, 400, 415 V 3Ph+N+PE*, 200-208-220V 3Ph+N+PE**						
Input Frequency	45-65 Hz						
Voltage Tolerance (%100 load)	(-20)% (+20)%						
Voltage Tolerance (%40 load)	(-36)% (+20)%						
Input Power Factor	>0,99						
Input Current Harmonic	≤3%						
Output Characteristics							
Output Voltage	380, 400, 415 V 3Ph+N+PE*, 200-208-220V 3Ph+N+PE** (Adjustable from Front Panel)						
Output Voltage Tolerance	+1%						
Overall Efficiency (AC-AC)	Up to 96%* (Half load)						
Ecomode Efficiency	Up to 98,5%						
Nominal Output Frequency	50/ 60Hz +0,01 free run (Adjustable from LCD Panel)						
Crest Factor	3:1						
Output Power Factor	1						
THD of Output Voltage	<2% (at full linear load)						
Batteries							
Battery Type	VRLA-AGM Maintenance-Free						
Battery Test	Automatic or Manual						
Battery Quantity	40 to 46 (Adjustable)						
Battery Recharge Time	<6h-8h						
Cold Start	Present						
Bypass Characteristics							
Bypass	Built in Automatic and Maintenance Bypass						
Voltage Tolerance	±10%						
Transfer Time	0 ms						
Overload Capability	150% for 1 minutes						
Communication and management							
LCD Display	Graphical lcd screen, Led bar status						
Communication Ports	RS232,Genset, SNMP, Relay Contacts,Input Contacts, Modbus and USB (optional)						
Battery Temperature Sensor Contact	Available						
Emergency Power Off (Epo)	Yes						
Remote Display	Available						
Physical Characteristics							
Dimensions HxWxD(mm)	1300 x 560 x 900						TBA
Net Weight (Kg)	150	160	170	220	240	TBA	
Ambient conditions							
Operating Temperature	0°C - 40°C						
Storage Temperature	-15°C/+ 55°C						
Proposed Temp. To Extend Battery Life	20- 25°C						
Relative Humidity (%)	<95% non condensing						
Noise at 1 m (dBA)	<60			<65			
Protection Class	IP 20						
Compliance							
Reference Product Standards	EN 62040-1-1 (Safety), EN 62040-2 (EMC), EN 62040-3 (Performance)						

* for 3Ph 400V Version
** for 3Ph 208V Version



The company reserves the right to change specifications and designs without notice.

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