INNOVASIS
INNOVATIVE ENERGY SYSTEMS





3:3
PHASE

DATA CENTER | MEDICAL | INDUSTRY | TRANSPORTATION | EMERGENCY

MASTERLINE SERIES

Three-Phase UPS from 300 - 1000 kVA

Three LEVEL UPS — 3 LEVEL UPS

VFI TYPE — UPS ONLINE

TOWER

96% — HIGH EFFICIENCY

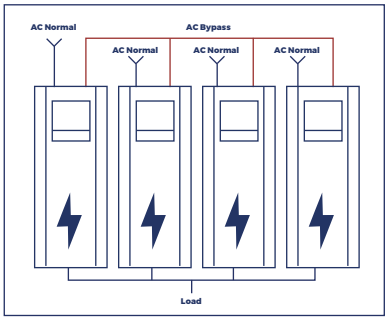
LI - ION Battery — LI - ION READY

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.

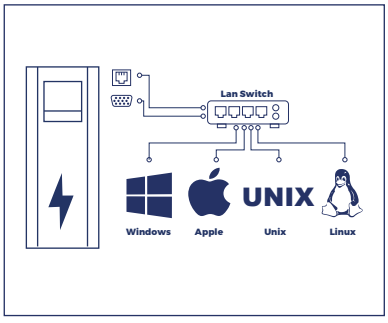
The Masterline Series UPS brings the latest power conversion technology to the marketplace, using a three level design with a multi mode architecture with atest generation components. These UPS aim to be functional, safe, easy to install and use.

- 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 (≤3%)
- High Input Power Factor (≥0.99)
- Low output voltage THD (≤2%)
- Short response time (≤2ms)
- Automatic soft-start
- Cold start
- Dual Input
- Advanced Battery Management
- 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
- Paralellable 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

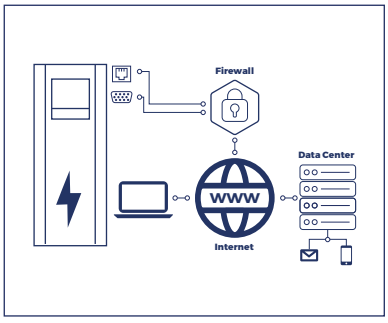


SELF LOAD POWER TEST

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 technical Service

COMPLETE, COST EFFECTIVE SOLUTION

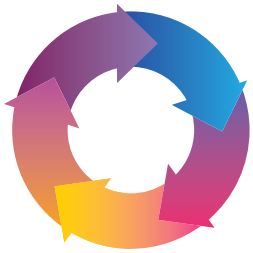
- Online double conversion mode with an real full power, according to IEC 62040: kW=kVA (unity power factor design) means 25% more active power available compared to legacy UPS.
- Dual input mains allow you to manage independent power sources.
- Increased system availability placing UPS in parallel for 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.



EASY MAINTENANCE

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.



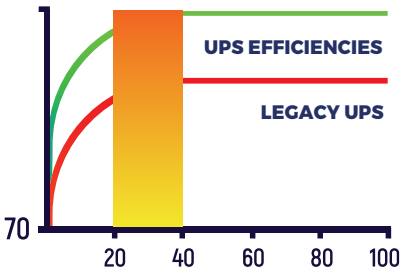
BACK-UP

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.



SCALABLE



EASY MAINTENANCE

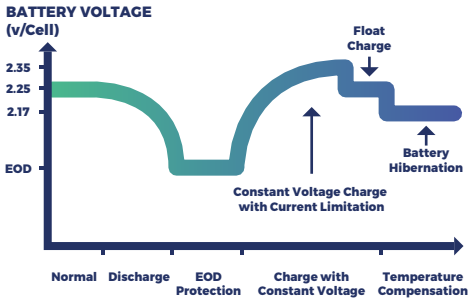
- Built-in manual bypass to eliminate maintenance related downtime.
- Proactive detection of fan failure and switch fault for early diagnosis on UPS malfunction.
- Plug and play card design to simplify the maintenance process.
- Easy service by the help of modular power board concept.
- MTTR is less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

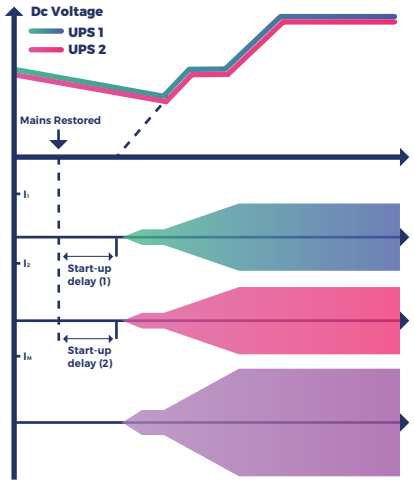
INTELLIGENT BATTERY MANAGEMENT SYSTEM

- 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.

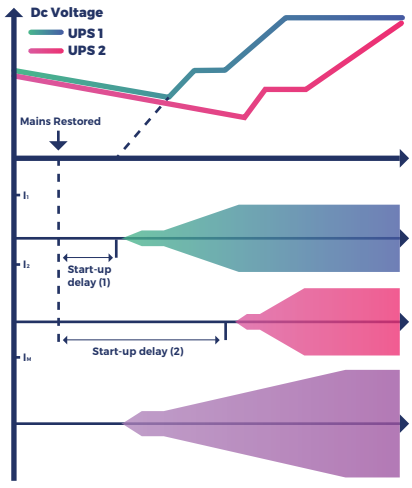
Intelligent battery management system can sustain battery lifespan and the capacity of battery backed up through the functions of;

- Monitoring & compensation battery remaining capacity displayed in percentage.
- Overcharge/discharge protection.
- Auto/manual battery test.
- 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.





Dc voltage and AC current behaviour using the same value for delay time



Dc voltage and AC current behaviour using different value for delay time

HIGH PERFORMANCE RECTIFER 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

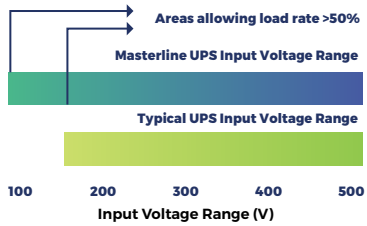
- Saving in the sizing of upfront equipment e.g. emergency generators, cablings and circuit breakers.
- No disturbances to nearby equipment; eliminate perturbation and outage on upfront electrical equipment, avoiding also any investigation and analysis cost due to malfunction In addition, UPS plays a 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).

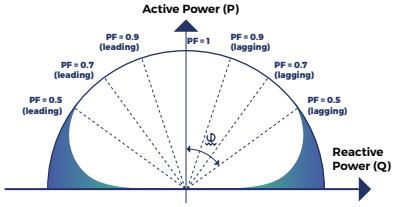
PERFECT GENERATOR COMPATIBILITY

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.



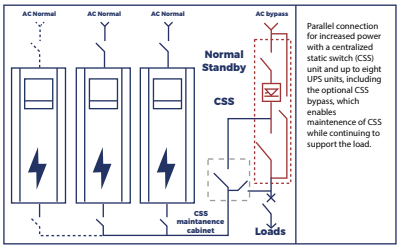
HIGH GRID ADAPTABILITY

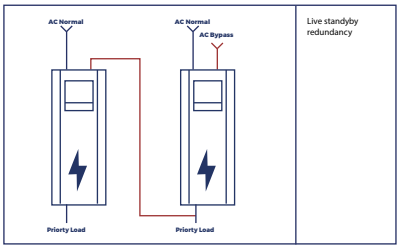
- 138-485 Vac wide input voltage range to minimize battery use: 485-305 Vac for 100% load; 305-138 Vac for 100%-40% load (derating linearly)
- 6 kV/5 kA lightning protection design, reducing lightning related failure rate.

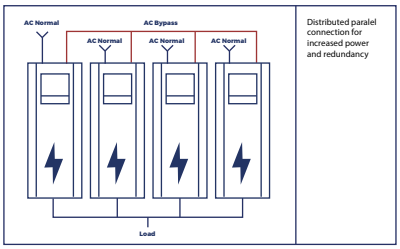


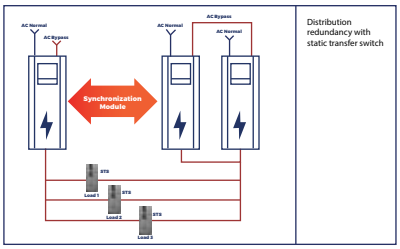
OUTPUT PERFORMANCE

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, eve with connected 100% unbalanced or 100% non-linear loads.

TRANSIENT RESPONSE

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

REDUNDANT PARALLEL FEATURES

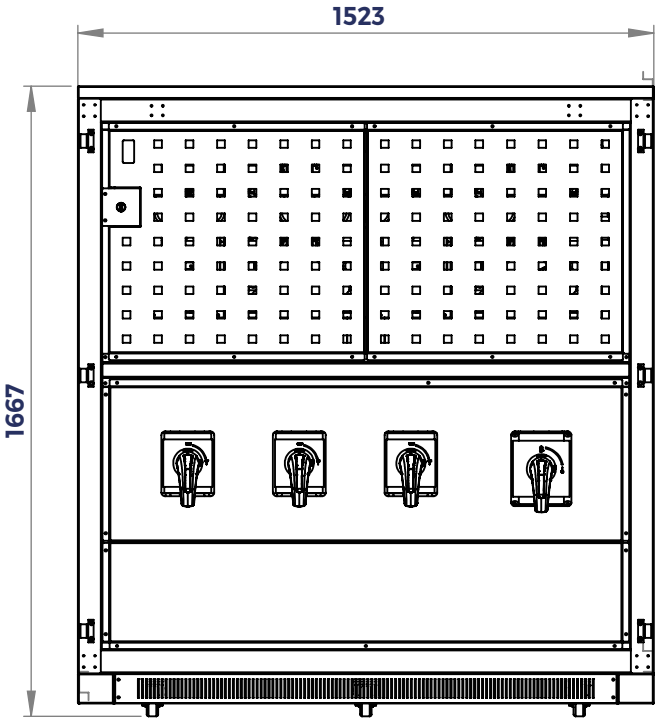
Thanks to unique control technology that can parallel UPS modules with true redundancy by eliminating any single point of failure, RPA provides a scalable paralleling technique that reduces operating footprint and increases system reliability by eliminating the need for external paralleling equipment 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;

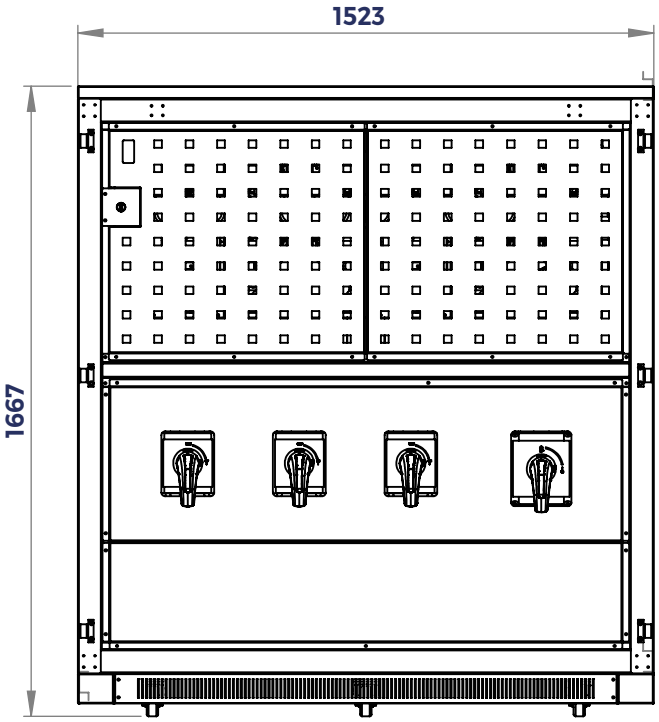
- Parallel connection with ring cable.
- Sequential Soft Start.
- Loop bus connection.
- Distributed Control Logic.
- Autosensing disconnected parallel cable.
- Redundant Communication.
- Easy power update without any interruption.
- Full synchronization of parallel units.
- Isolated parallel operation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

DETAILS

3.3.1 300kVA U1 Model // 400kVA-500kVA U1 // U2 // U3 Model Sizes



3.3.1 500kVA U1 Model // 600kVA-800kVA U1 // U2 // U3 Model Sizes



MASTERLINE SERIES

MODEL	MST 330300U1	MST 330400U1 MST 330400U2 MST 330400U3	MST 330500U1 MST 330500U2 MST 330500U3	MST 330600U1 MST 330600U2 MST 3301500U3	MST 330800U1 MST 330800U2 MST 330800U3	MST 3301000U2 MST 3301000U3
Nominal power (kVA)	300	400	500	600	800	1000
General Specs						
Technology	Three Level On-Line double conversation 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					
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					
Output Voltage Tolerance	±1%					
Overall Efficiency* (AC-AC)	Up to 96%					
Ecomode Efficiency	Up to 98% (Optional)					
Nominal Output Frequency	50/ 60Hz +0,01 free run (Adjustable from LCD Panel)					
Crest Factor	3:1					
Output Power Factor	1 (U1 model) / 0,9 (U2 model) / 0,8 (U3 model)					
THD of Output Voltage	≤2% (Linear load) & ≤5% (Non-linear load)					
Batteries						
Battery Type	VRLA-AGM / GEL / NiCd / Li-ion					
Battery Test	Automatic or Manual					
Battery Recharge Time	<6h-8h					
Communication and management						
LCD Display	Graphical lcd screen, Led bar status					
Communication Ports (Optionals)	RS485, Genset, SNMP, GSM Modem, Relay Contacts, Input Contacts, Modbus and USB					
Battery Temperature Sensor Contact	Available					
Emergency Power Off (Epo)	Available					
Accessories (Optional)	Galvanic Isolation Transformer, Remote Monitoring Panel					
Physical characteristics						
Dimensions H x W x D (mm)	1633 x 1273 x 880 1633 x 1890 x 880 (500kVA U1)			1950 x 2950 x 930		
Net Weight (kg)	850	860	870	1500	1540	1560
Ambient conditions						
Operating temperature (°C)	0°C - 40°C					
StorageTempature	-15°C/+ 55°C					
Proposed Temp. To Extend Battery Life	20- 25°C					
Relative Humidity (%)	< 95% not condensing					
Altitude	< 1000m					
Noise (at 1 meter)	<68 dBA			<72 dBA		
Protection Class	IP 20 (Higher IP Ratings are optional)					
Compliance						
Referance Product Standards	EN 62040-1-1 (Safety), EN 62040-2 (EMC), EN 62040-3 (Performance)					

* Depends on Input/Output voltage conditions and power

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