INNOVASIS

INNOVATIVE ENERGY SYSTEMS

3:3 PHASE

DATA CENTER | MEDICAL | INDUSTRY | TRANSPORTATION | EMERGENCY

MODULINE SERIES

3 Phase Input
3 Phase Output UPS
50 - 500 kVA

Three LEVEL UPS — 3 LEVEL UPS

VFI TYPE — UPS ONLINE

TOWER

96% — HIGH EFFICIENCY

Li-On Battery — Li-On READY

MODULINE SERIES

Moduline Series UPS, using the latest generation power components, new generation 3-Level technology, has the flexibility to operate between 50 and 500kVA powers with a single cabinet thanks to its hot-swappable modular structure. It offers a functional, safe, easy to install and use product with the latest power conversion technology. 3 units can be configured in parallel for a capacity up to 1500kVA.)

3 Level IGBT Technology Full Rated Power: kW=kVA
Online Double Conversion Technology (Class VFI-SS-111)
IGBT PWM Rectifier & Inverter Technology
Multiprocessor digital control 96% high efficiency
Up to 98% efficiency with Eco mode feature
Low input current TDH (≤3%)
High input power factor (≥0.99)
Low output range THD (≤2%)
Low response time (≤2ms)
Automatic soft start
Input that can change depending on the load that reduces battery voltage
Ability to start from battery
3 units can be configured in parallel
Intelligent backup management (n,n+1and n+x)
256 detailed real-time event records
The system is from 50kVA in a single cabinet capacity up to 500kVA, up to 1500kVA configurable for 3 units in parallel
Double entry

- Static and Manual Bypass system
- Optimum footprint and ease of maintenance
- Data analysis via user panel
- Wide range of communication options
- Remote monitoring and management software
- Excellent generator compatibility
- With programmable dry contact
- Advanced battery management
- 10.4” touch color LCD with graphic display
- Independent LCD for each power module
- DC/DC Charger/Booster Ability to connect flexible number of batteries
- Wide input voltage operating range
- Operating voltage (up to -36%)
- 4U height 50kVA power module, capacity provides ease of expansion
- Short circuit, overload, lightning and voltage surge protection up to 8 parallel connections Intelligent backup management (n,n+1and n+x) 256 detailed real-time event records
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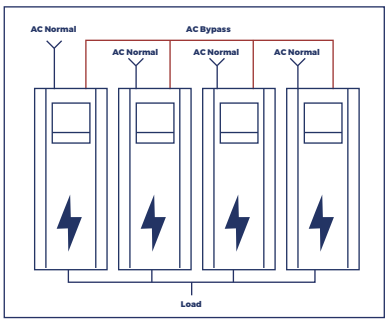
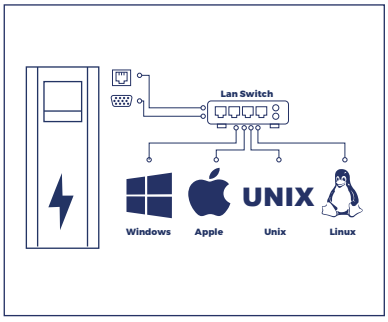


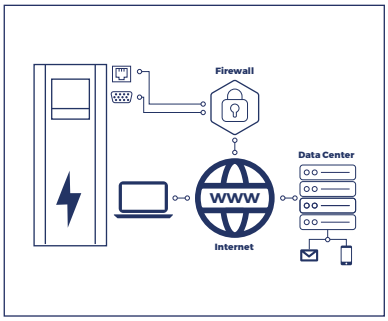
SELF LOAD POWER TEST

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



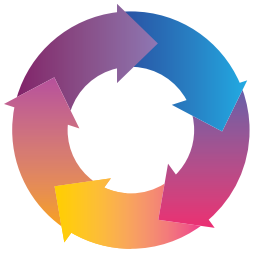
COMPLETE, COST EFFECTIVE SOLUTION

- 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.

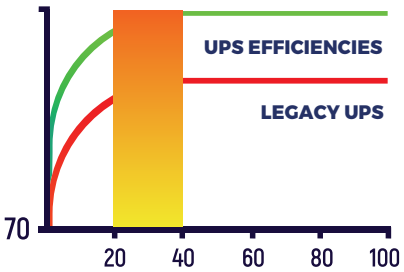


BACK-UP

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

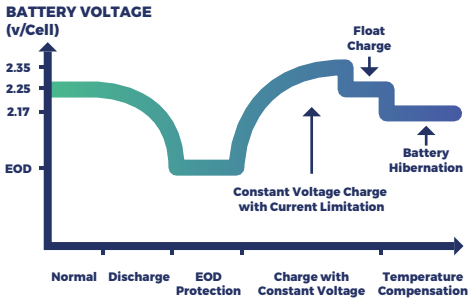
- Built-in manual bypass to eliminate maintenance related downtime.
- Proactive detection of fan failure and switch fault for early diagnosis on UPS malfunction.
- Plug and play card design to simplify the maintenance process.
- Easy service by the help of modular power board concept.
- MTTR is less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

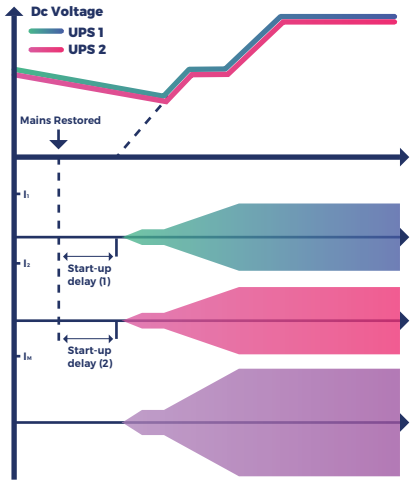
INTELLIGENT BATTERY MANAGEMENT SYSTEM

- 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.

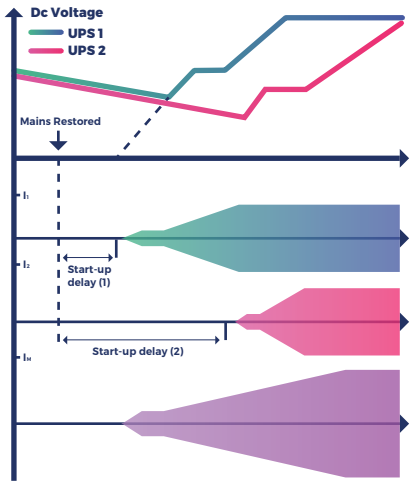
Intelligent battery management system can sustain battery lifespan and the capacity of battery backed up through the functions of;

- 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

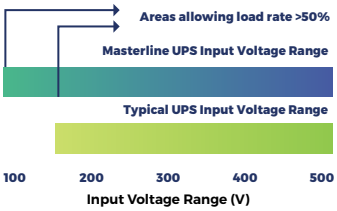
- Saving in the sizing of upfront equipment e.g. emergency generators, cablings and circuit breakers.
- No disturbances to nearby equipment; eliminate perturbation and outage on upfront electrical equipment, avoiding also any investigation and analysis cost due to malfunction In addition, UPS plays a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

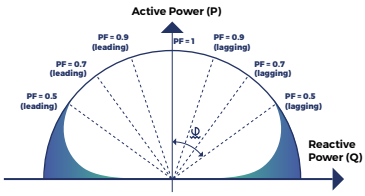
PERFECT GENERATOR COMPATIBILITY

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.



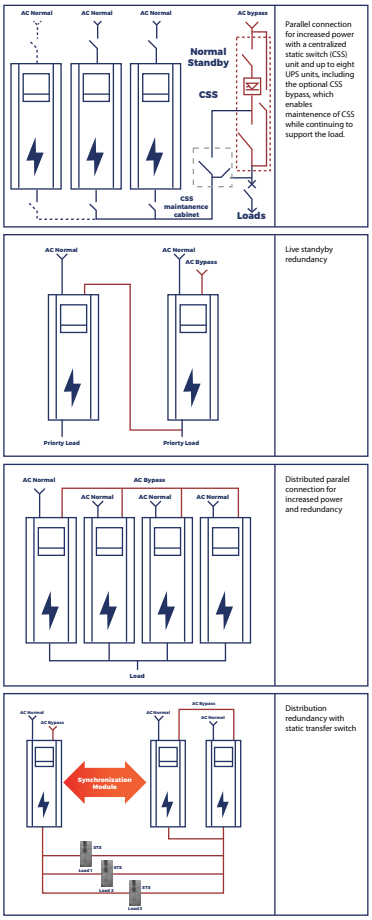
HIGH GRID ADAPTABILITY

- 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.

MODULINE MDL500 SERIES

MODEL		MDL-5100/50	MDL-5200/50	MDL-5300/50	MDL-5500/50	MDL-5600/50X1
System capacity		100kVA	200kVA	300kVA	500kVA	600kVA
Power module capacity		TPM50 (50kVA/50kW)				
INPUT						
Dual input		Standard		Optional	Standard	
Phase		3 Phases + Neutral + Ground, 380V/400V/415V (line-line)				
Voltage range		304~478VAC (line-line), full load; 228V~304VAC (line-line), load decreases linearly according to the min. phase voltage				
Rate frequency		50Hz/60Hz				
Frequency range		40Hz/70Hz				
Power factor		> 0.99				
THDi		< 3% @ 100% linear load				
BYPASS						
Rate voltage		380/400/415VAC (Line-Line)				
Rated frequency		50Hz/60Hz				
Input voltage range		Settable, -40% ~ +25%				
By-pass frequency range		Selectable, ±1Hz, ±3Hz, ±5Hz				
Bypass overload		125%, long time operation < 130% for 10 minutes < 150% for 1 minutes >150% for 300ms		110% long term operation < 130% for 10 minutes < 150% for 1 minutes >150% for 1 ms		110% long term operation 110% ~ 125% last for more than 5 min. 125% ~ 150% last for more than 1 min. >150% last for more than 1 s.
OUTPUT						
Rated inverter		380/400/415VAC (line-line)				
Voltage regulation		1% for balance load;1.5% for unbalance load				
Rated frequency		50Hz/60Hz				
Frequency precision		0.1%				
Output power factor		1.0				
Output THDu		< 1%, Linear load; <5.5% Non-linear load				
Crest factor		3:1				
Inverter overload		110% for 1 hour; 125% for 10 mins; 150% for 1 min; >150% for 200 ms				
BATTERY						
Voltage		±240VDC				
Battery number		40pcs (Settable: even number from 32 to 44)				
Voltage precision		1%				
Charge power		up to 20% Output active power				
Battery cold start		Optional		Standard		
SYSTEM						
System efficiency		AC Mode: 96.0% ECO Mode: 99.0% Battery Mode:96.0%				
Display		10.4" touch screen LCD+LED+keyboard				
IP class		IP20				
Interface		RS232, RS485, Programmable Dry Contact, USB				
Option		SNMP Card, Parallel kit, SPD, LBS, Dust filter				
Temperature		Operation: 0~40°C Storage: -40~70°C				
Relative humidity		0~95% (non-condensing)				
Altitude		< 1000. Within 1000m to 2000m, power derate 1% for every 100m rise				
Acoustic noise		72dB @ 100% load, 69dB @ 45% load				
Application standards		Safety: IEC/EN 62040-1, EMC:IEC/EN 62040-2, Performance: IEC/EN 62040-3				
PHYSICAL						
Net weight (kg)	Cabinet	120	170	220	450	1040
	Power module	45				
Dimension (HxWxD)	Cabinet	1150x600x980	1600x650x960	2000x650x1095	2000x1300x1100	
	Power module	178x510x700				

* Depends on Input/Output voltage conditions and power

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