

DALTON

Modular On-line double conversion UPS
High-performance three-phase UPS
Hot swappable, scalable UPS
Latest DSP Technology



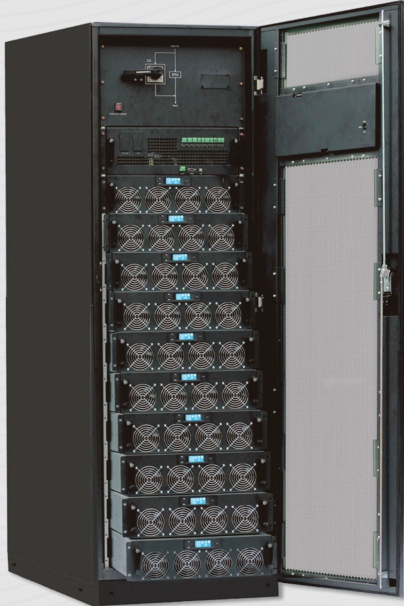
M33 Series (300KVA-1500KVA)



- Dalton M33 Series is modular online UPS for a super important highly sensitive equipment. The single cabinet power rating covers from 300kVA to 1500kVA. With the latest IGBT three-level and full DSP control technology, Modular M33 is designed to avoid the systems downtime and minimizes repairing times through the modular concept, since it is possible at any time to replace the power module reducing the MTTR. Power module replacement doesn't need to transfer the system in bypass and therefore doesn't become necessary shutdowns of servers or other equipment.
- Modular design up to 15 power modules in parallel online hot-swappable N+X redundancy.
- UPS output PF=1, THDI<3%.
- Highest double conversion technology, 3 Level IGBT.
- Fortified UPS with fully protection types like a short circuit & over load protection.
- Independent charger for each module.
- Intelligently control the whole charging process. prolong the life time of the battery.
- Dual mains input for increased availability.
- Independent air channel keeping PCB free of dust.
- Full DSP control of high stability, reliability and safety.
- Ultra high efficiency up to 97% online mode.
- High power density of 100 kVA / 3U power module.
- Small Footprint, compact & High Power Density.
- Only 3 minutes needs for module replacement.
- Web/SNMP card allows.
- EPO (Emergency Power Off) to power down the. UPS through a remote emergency push button.
- Friendly interface, Touch LCD display.
- 15 Years Spare parts Support.
- 7 inches LCD touch screen, friendly human-machine interface.
- Lowest TCO (Total Cost of Ownership).

Display and Communication

M33 series has a large touch screen display, complete and user friendly, that allows to record more than 1000 logs and to perform very accurate analysis. It is possible to monitor all main system parameters, including batteries health and their operating status. Password control at different levels to manage access of UPS configuration the graphical user interface is designed with 3 levels of access (user and maintenance) to allow multiple users to access or modify only specific parameters. 7" colorful display equipped with EPO (Emergency Power Off button) and with Led status indicator integrated. Total control and access of all power modules parameters allows to monitor modules temperature, fans speed and Smart Parallel Management mode. First commissioning can be executed without using any external tools. The three level password protects against accidental accesses and dangerous settings.



Key features.

True modular design.

Power expansion simply by adding power module without need any downtime and extra space.

HOT SWAP design.

Power module can be replaced or added while another module continues protecting the load.

DOUBLE DSP.

Precision Controller for Rectifier, Inverter, Charger & Super Charger to achieve system stability, reliability and efficiency.

INTELLIGENT BATTERY CHARGER.

In each module, selectable to deliver up to 20% of the rated power per UPS module for battery charging.

INDEPENDENT AIR CHANNEL.

Cooling air runs in isolated channel, keeping PCB free of dust.

REDUNDANCY and CAPACITY.

Power frame can be paralleled for redundancy or expansion (M33 300 and 1500).

BYPASS.

Bypass is modular and fully rated according to the maximum power of the system. Completely hot swappable bypass reduces at minimum the maintenance process and guarantees best availability levels. Bypass is modular and fully rated according to the maximum power of the system.

Smart and safe.

Intelligence is distributed throughout the system, safeguarding the equipment even in rare cases of power module failure.

Each module undergoes an automatic health-check upon connection, ensuring its proper status and preventing the integration of defective components.

Firmware automatically aligns when a module with different firmware is inserted.

The firmware can be fully upgraded while the unit operates in ON LINE double conversion mode.

Continuous monitoring via multiple sensors within each module optimizes performance and enables tailored predictive maintenance based on real operating conditions.

Integrated interleaving technology effectively reduces ripple current, extending the life of batteries and DC capacitors.

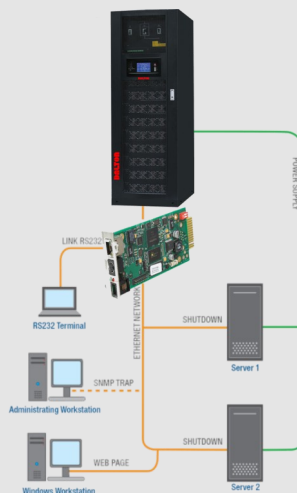
Advanced Communication.

Web/SNMP card allows UPS management across a LAN using any of the main network communication protocols (TCP/IP, HTTP and network interface via SNMP). The system can notify users and administrators via email; when prolonged power failure occurs the protected computer systems can be shutdown safely.

RS232 port & RS485 port

with ModBus interface protocol.

Relay/AS400 card is an interface for input/output dry contacts and AS400 series computer, common manner for industrial and building management systems.



Reliable and resilient.

Dalton M33 innovative internal communication structure utilizes two independent, fully redundant high-speed buses, ensuring maximum reliability.

Every system component, from individual modules to the full cabinet, is perfect meticulously designed and crafted.

All parts are rigorously vetted through a stringent approval process to guarantee quality and durability.

Each module and entire unit are tested intensively to verify the optimal functioning of all components.

Collected data and measurements are continuously analyzed, driving ongoing product enhancement and delivering the latest technology to our customers.

The UPS's extended lifespan is supported by embedded status counters and advanced sensors for temperature and humidity, providing real-time analytics for proactive monitoring.

M33 Series designed to house 15 power modules & Smart parallel management.

To reach the maximum capacity of 1500 kVA smart parallel management is the innovative power modules control system that maximizes UPS yield and life. Depending on the requirements, the system is able to automatically manage modules operation, switching them on and off according to load level and operating hours.

For expandable to 6000kVA by connecting four frames in parallel.

System advantage.

1. M33 Highest reliability (MTBF of the power availability is much more than the stand alone UPS) & much lower Mean Time To Repair (MTTR). Average time to replace the module is less than 3 mins.
2. With its swappable design, there is no supply interruption when replacing the faulty module.
3. Double DSP controller per power module for Rectifier, Inverter, Charger & Super Charger.
4. Power expansion simply by adding similar capacity module without any downtime and extra footprint.
5. Very low maintenance costs.
6. Each module is designed with intelligent battery charger, charging power is selectable from 0 to 11.3kW per module, with 16 module installed total charging power can reach 145.7kW.
7. Large touch screen LCD with comprehensive detail.

High Flexibility.

Modular UPS usually guarantees a higher availability in comparison with the stand-alone UPS. In Dalton M33 these characteristics are particularly evident, due to its hot swappable components, such as the UPS units and the centralized bypass. Moreover, with additional cabinets, working in parallel bypass, it can reach the large power of 1500kVA.

Modular IGBT design.

IGBT Rectifier With PFC control to achieve input THDi < 3% and input P.F 0.99.

IGBT Inverter Using 3 level IGBT power bridge technology with high frequency PWM modulation switching to perform high load factor and efficiency up to 97%.

High availability, the most reliable N+X wireless parallel redundant structure.

M33 advanced system level of N + X parallel redundancy can greatly improve the reliability of the UPS power supply, the adoption of leading wireless parallel control technology, compared with wired in parallel to reduce the single failure point (steady work also can work normally even if the parallel line fault), and improve the system reliability.

Maintenance management.

M33 Total control of all main important parameters in order to perform a preventive maintenance scheduling. Battery test available in automatic or manual mode ensures to prolong the battery lifetime. A pre-alarm signal indicates the battery change moment, before their end of life. Coated PCB boards and an exclusive air ventilation system ensure a longer duration also in critical environment.

Dalton M33 Hot swappable module .

Three phase power module with rating 100KVA / 100KW



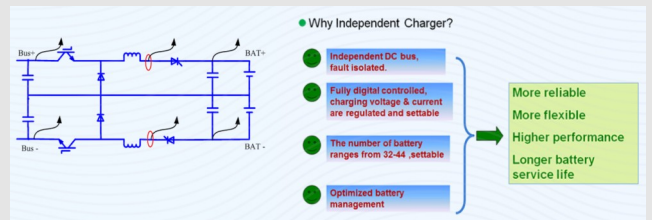
Automatic Configuration.

Each new module inserted in the systems makes an auto setup based on the new total power available.



M33 Independent Charger.

Each Power has Independent Charger and full digital control Max Charger Current: 20%*Power, adjustable



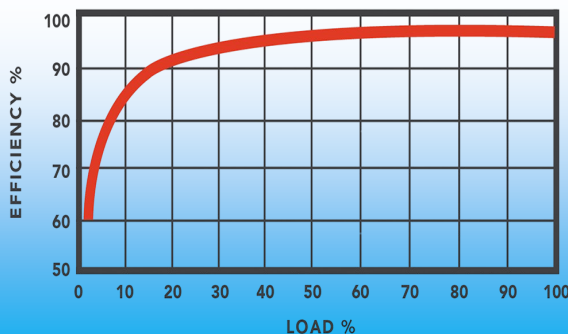
M33 Internal aerodynamic design.

Air flow channel and PCB air isolated



LOAD %	EFFICIENCY %
25	94.1
50	96.3
75	96.9
100	97.0

Figure 3. UPS efficiency



Efficient energy saving.

Increase system efficiency when in low load. Easy setting, friendly for customers. Power modules working in rotation, prolong the total life time.

Even small increases in UPS efficiency can quickly translate into thousands of dollars, realized in more real power and lower cooling costs. Energy Saver System (M33) enables efficiency levels of over 99% across the typical UPS operating range.

Technical Specifications

Model		M33KL300	M33KL400	M33KL500	M33KL600	M33KL800	M33KL1000	M33KL1200	M33KL1400	M33KL1500	
Rating Power		300KVA 300KW	400KVA 400KW	500KVA 500KW	600KVA 600KW	800KVA 800KW	1000KVA 1000KW	1200KVA 1200KW	1400KVA 1400KW	1500KVA 1500KW	
Power Module Type		PMKL100U (100KVA / 100KW)									
Input	Rate voltage	380 / 400 / 415 V three-phase + N + E									
	Voltage range	138 ~ 485 Vac (324 ~ 485 Vac without power downgrading; 139 ~ 324 Vac with linear downgrading 35%)									
	Rate frequency	40~70 Hz									
	Power factor	> 0.99									
	Harmonic distortion (THDi)	< 3% at (100% linear load)									
Output	Voltage tolerance	-20% ~ + 25%									
	Rate voltage	380/400/415Vac (line-line)									
	Voltage regulation	1% for balance load; 1.5% for unbalance load									
	Power factor	1									
	Harmonic distortion (THDu)	THD < 1% (linear load), THD < 5.5% (none linear load)									
	Output waveform	Pure Sinewave									
	Rate frequency	50/60 Hz ± 1%									
	Overload capability	110% for 1 hour; 125% for 10min; 150% for 1min; >150% for 200ms									
	Transfer time	AC mode to Battery mode (0ms)									
		Inverter to Bypass (0ms)									
	Crest factor	3:1 (max.)									
	Efficiency	Online mode	97%								
		Eco mode	99%								
Battery mode		98%									
Inverter overload capability	105% < load ≤ 110%: transfer to bypass in 60 min 110% < load ≤ 125%: transfer to bypass in 10 min 125% < load ≤ 150%: transfer to bypass in 1 min Load > 150%: transfer to bypass in 200 ms										
Unbalanced load	100% - independent phase regulation										
BYPASS	Rate voltage	380/400/415Vac (line-line)									
	Voltage range	Settable, -40%~+25%									
	Bypass overload capability	Load ≤125% for long term; >200% load for 100 ms									
	Frequency range	50/60Hz									
	Bypass frequency range	Settable, ±1Hz, ±3Hz, ±5Hz									
Battery	Voltage	480 Vdc (360~600Vdc adjustable)									
	Numbers	40 pcs 12 V batteries (30~50 pcs adjustable)									
	Charging voltage	up to 20% * Output active power									
	Voltage precision	±1%									
	Typical recharge time	6 hours recover to 95% capacity									
	Battery type	Sealed maintenance-free lead –acid battery / Gel Battery / Lithium battery / NiCd battery / Na battery									
System	Storage temperature	-25°C ~ 55°C (without batteries)									
	Operating temperature	Operation: 0~ 40°C Storge: -40 ~70°C									
	Parallel availability	Up to 4 units									
	Humidity	20%~95%									
	Altitude	≤ 1000 m, derating 1% for each additional 100 m									
	Alarm	Overload, short circuit, abnormal AC input, low battery, UPS failure									
	Protections	Short circuit, overload, over temperature, low battery, output over voltage, output low voltage, Fans failure etc.									
	Standards	European Directives: L V 2006/95/CE low voltage Directive EMC 2004/108/CE electromagnetic compatibility Directive Standards: Safety IEC EN 62040-1; EMC IEC EN 62040-2 C2 Classification in accordance with IEC 62040-3 (VFI)- SS - 111									
	Noise (dB)	Less than 55dB @1 Meter in half load									
	Display indicator	UPS status, Load level, Battery level, Input/output voltage, Discharge timer, and Fault conditions									
	Communication software	Windows XP/ 2003 and later version; Linux; Unix and MAC									
	Optional	SNMP Card/ Dry Contact AS400 Card/ CMC Card/ RS485 Card/ EMD Monitoring Device/GPRS card/LPS port									
	Protection degree	IP20									
Physical	Weight (kg)	Cabinet	435			912			1225		
		Power module	50								
	Dimentions WxDxH (mm)	Cabinet	6 Module (800 x 1010 x 2010)				12 Module (2010 x 1010 x 2010)			15 Module (2880 x 1010 x 2010)	
		Power module	440 x 750 x 130								

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