



CLEANSOURCE® PLUS MMS MODULAR UPS SYSTEMS

60Hz | 333kW TO 2667kW | 480V
FLYWHEEL TECHNOLOGY



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Overview

CLEANSOURCE® PLUS MMS Modular UPS System offers a wide range of modular and redundant back-up power systems from 333kW to 2667kW.

The built-in flywheel energy storage takes up less than half the footprint of battery-based systems, delivers efficiency up to 98% and lowers total cost of ownership by up to 40% over the life of the product.

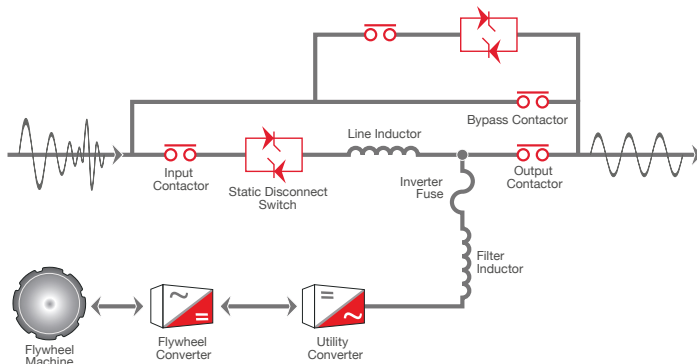
This field-proven technology is based on a highly fault tolerant IGBT architecture designed to protect all critical loads, such as data centers, industrial processes and health care applications. Stored energy will provide ride-through up to 2 minutes depending upon configuration, making the CLEANSOURCE® PLUS MMS a clear alternative to modular static UPS systems reliant on battery storage.

The CLEANSOURCE® PLUS MMS Modular UPS System has more than enough energy storage for diesel starting and synchronization, even when paralleling generating sets. Elimination of batteries saves space and weight, reduces site testing and maintenance and removes the need for routine replacement after a few years of service life.

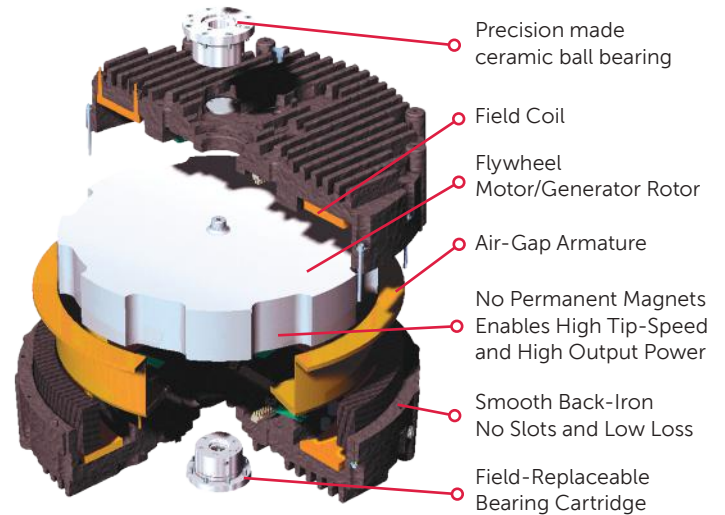
Parallel Online Architecture

The CLEANSOURCE® PLUS MMS Modular UPS is based on Active Power's Parallel Online Architecture which provides excellent isolation between input and output, while delivering Class 1 voltage regulation and dynamically cancelling effects of non-linear load harmonics.

This topology continuously provides online power protection to your operation, creating a clean sinusoidal output waveform and protecting critical operations against all nine IEEE power disturbances in a power dense, reliable, and energy-efficient package.



FLYWHEEL TECHNOLOGY



- ▶ STORES 6.2 MJ OF ENERGY
- ▶ UP TO 2 MINS. OF RUN-TIME (LOAD DEPENDENT)
- ▶ WIDE OPERATING TEMPERATURE RANGE FROM 32°F TO 104°F
- ▶ HIGH DENSITY, HIGH EFFICIENCY DESIGN

KEY BENEFITS AND FEATURES

- UP TO 98% EFFICIENT
- HALF THE SPACE OF LEGACY BATTERY-BASED UPS
- FIELD EXPANDABLE
- REDUNDANT FANS AND CONTROL POWER UNITS
- LOWER COOLING REQUIREMENTS
- LOWER MAINTENANCE AND SERVICE
- COST-EFFECTIVE INSTALLATION
- COLOR LCD TOUCH SCREEN DISPLAY
- REMOTE MONITORING
- BUILT-IN POWER FACTOR CORRECTION
- GENERATOR COMPATIBILITY
- DUAL INPUT AND INTEGRATED MAINTENANCE BYPASS OPTION
- SEISMIC PROVISIONS – CONSULT FACTORY
- 20-YEAR DESIGN LIFE
- 333kW BUILDING BLOCKS EXPANDABLE TO 2667kW

40%

TCO SAVINGS

PERMANENT ENERGY STORAGE
UP TO 98% ENERGY-EFFICIENT
LESS EXPENSIVE TO INSTALL
AND COMMISSION

12x

LESS LIKELY TO FAIL

MOST RELIABLE ENERGY STORAGE SYSTEM
MINIMIZE RISK AND DISRUPTION FROM MAINTENANCE AND REPLACEMENT

40%

LESS CARBON EMISSIONS

OVER 40% LESS CARBON EMISSIONS OVER 20 YEARS TO HELP YOU ACHIEVE YOUR SUSTAINABILITY GOALS

CLEANSOURCE® PLUS MMS combines a competitive initial cost with lower ongoing operational expense – up to 40% lower than traditional UPS over 20 years. The result is a dramatic TCO benefit for your application, with net savings.

► SUPERIOR ENERGY EFFICIENCY

Over 96% efficient at 40% load.

► REDUCED COOLING NEEDS

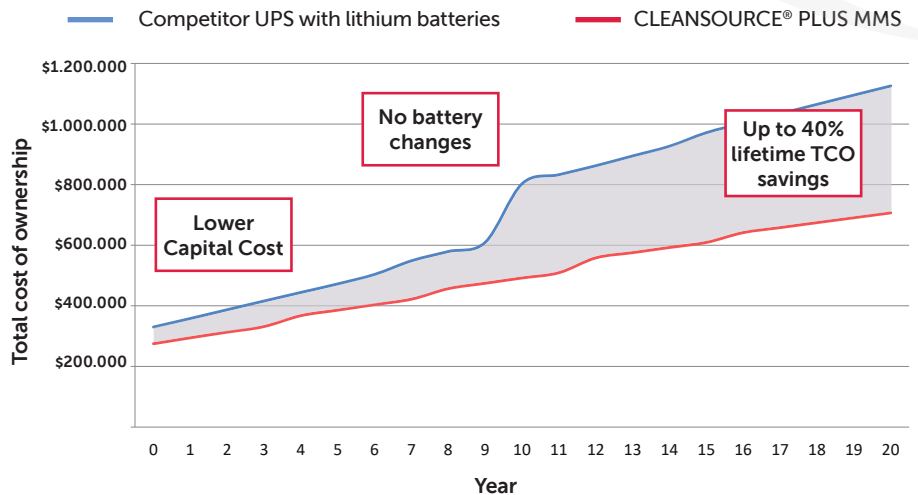
No need for dedicated cooling for batteries

► LOWER MAINTENANCE REQUIREMENTS

Routine annual check-up and bearing change every fourth year.

► NO BATTERY CHANGES

Integrated flywheel with 20-year life.



Modular and Scalable Architecture

CLEANSOURCE® PLUS MMS Systems are modular and capable of multiple redundancy levels. Customers may readily expand their systems in line with their own growth needs by adding further modules over time. Each system consists of an input/output cabinet (IOC), a system cabinet (SC) and the ability to connect up to four 333kW modules with built-in wireway. In total, 8 modules can operate in a single system, providing up to 2667kW of high efficiency, battery-free UPS power. CLEANSOURCE® PLUS MMS Series UPS can be configured from 333kW up to 2667kW.



60Hz | 333kW TO 2667kW | 480V

PRODUCT SPECIFICATIONS

MODEL	PLUS MMM 333		PLUS MMS 667		PLUS MMS 1000		PLUS MMS 1333	
RATING								
Maximum kVA	370		740		1110		1480	
Maximum kW	333		667		1000		1333	
INPUT								
Voltage ¹	480 VAC 3-phase, 3-wire plus ground (4-wire optional)							
Voltage Range	+10% / -15% (programmable)							
Frequency	60 Hz +/- 10% maximum (programmable) +/- 3% (default)							
Power Factor	0.99 at rated load and nominal voltage							
Harmonic Current Distortion	Linear load	<2% at 100% load						
	Non-linear ²	<8% at 100% load						
Current – Nominal (480 VAC)	414A		830A		1244A		1658A	
Current – Max. Continuous	500A		1000A		1500A		2000A	
Current – Max. Non-Continuous	525A		1050A		1575A		2100A	
Surge Withstand	Meets IEEE 587/ANSI C62.41							
Walk-in	1 to 15 seconds (programmable)							
OUTPUT								
Voltage	480 VAC 3-phase, 3-wire plus ground (4-wire optional)							
Voltage Regulation	Steady State	+/-1% for +/-10% input						
	Flywheel Mode	+/-1% steady state						
	Transient	+/-1% within 50 mSec for 100% load step						
Voltage Distortion ²	<1% linear loads and <5% for 100% non-linear loads							
Frequency	60Hz (mains synchronized) (normal operation +/- 0.2% free running)							
Slew Rate	Adjustable from 0.2Hz/second to 3.0Hz/second							
Current – Nominal (480 VAC)	445A		890A		1335A		1780A	
Overload Capability-Mains Operation			Cont. 105%	10 min <110%	5 min <125%	1 min <150%	10s <200%	lmd. >200%
Efficiency – Energy Storage Online	98%							
ENERGY STORAGE								
Type	Integrated Steel Flywheel spinning at 10,000RPM							
Flywheel Run Time (% Load)			100% 18s	75% 24s	50% 35s	25% 62s		
Flywheel Recharge Time ³	< 3 min (nominal) at 65kW							
GENERAL								
Internal Maintenance Bypass Panel	Yes (optional)							
N+1 Redundant Module	Yes (optional)							
OSHPD Seismic Rated	Consult factory							
ENVIRONMENTAL								
Audible Noise	<75 dBA at 1 meter							
Operating Temperature	32 to 104°F (0 to 40°C)							
Storage Temperature	-13 to 158°F (-25 to 70°C)							
Humidity	5% to 95% (non-condensing)							
Altitude	Up to 3,000 feet (914m) / 1.2 C derating for every 1,000ft above 3,000ft							
Emissions and Immunity	FCC Part 15 Class A, EN 62040-2							
Heat Rejection – Online	6.8kW/23,204BTU/Hr		13.6kW/46,478BTU/Hr		20.4kW/69,682BTU/Hr		27.2kW/92,886BTU/Hr	
PHYSICAL DATA								
Height	78.0in/1,981mm Excl. Wireway. 96.0in/2,438mm Inc. Wireway							
Width	127.0in/3,226mm		170in/4,318mm		213.0in/5,410mm		256.0in/6,502mm	
Depth	34.0in/865mm		34.0in/865mm		34.0in/865mm		34.0in/865mm	
Weight	6,750lbs/3,063kg		11,250 lbs/5,103kg		15,750lbs/7,144kg		20,250lbs/9,185kg	
Cable Entry	Top or Bottom							
Safety	UL 1778 Listed. CUL CAN/CSA 22.2 No. 107.1 Listed							

¹ From grounded WYE source. ² EN 62040-3. ³ kW recharge value is per flywheel.



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