



CLEANSOURCE® PLUS MMS MODULAR UPS SYSTEMS

60Hz | 300kW TO 2400kW | 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 300kW to 2400kW.

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.

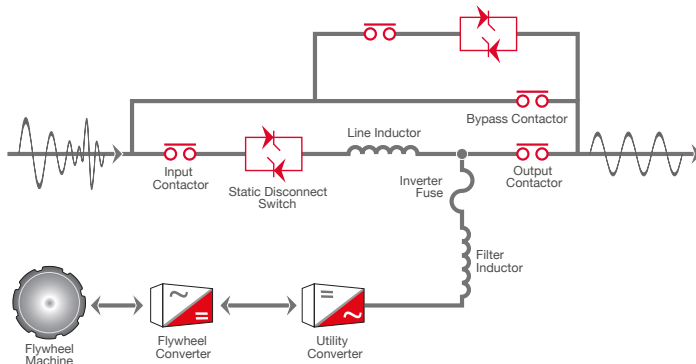
This field-proven technology is based on a highly fault tolerant IGBT architecture designed to protect all critical loads, such as data centers, industrial processes and health care applications. Stored energy will provide ride-through up to 2 minutes depending upon configuration, making the CLEANSOURCE®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

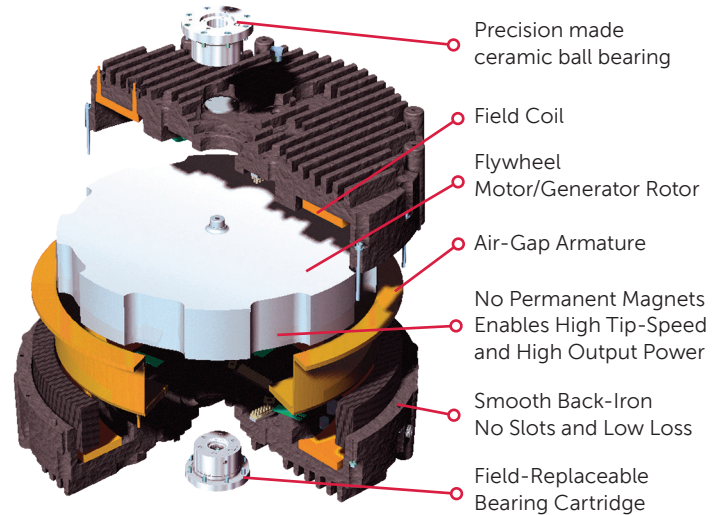
Parallel Online Architecture

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
- ◉ 300kW BUILDING BLOCKS EXPANDABLE TO 2400kW

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

9x

LESS CARBON EMISSIONS

90% LESS CARBON USED IN UPS MANUFACTURE
OVER 40% LESS CARBON EMITTED OVER 20 YEARS

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

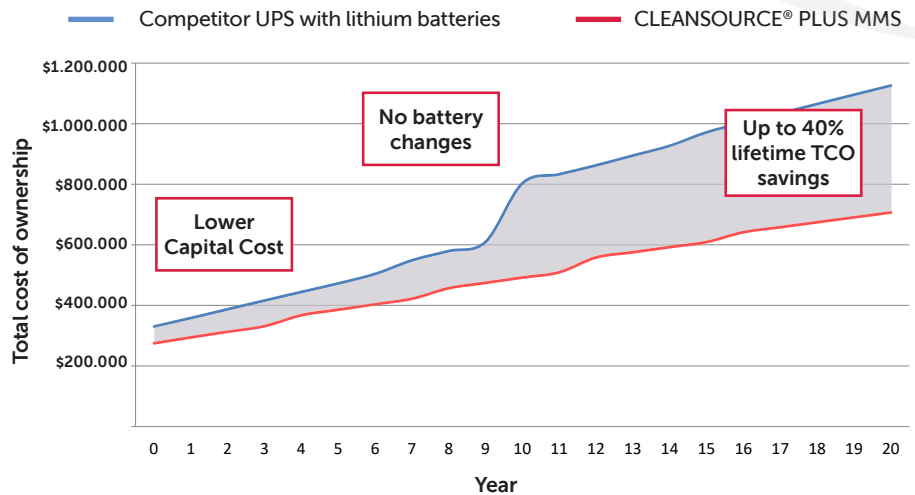
No need for dedicated cooling for batteries

► LOWER MAINTENANCE REQUIREMENTS

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

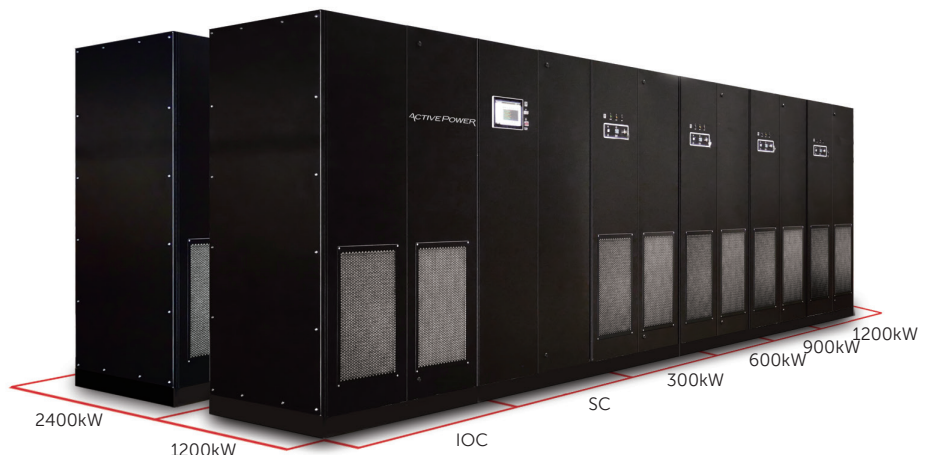
► NO BATTERY CHANGES

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 300kW modules with built-in wireway. In total, 8 modules can operate in a single system, providing up to 2400kW of high efficiency, battery-free UPS power. CLEANSOURCE® PLUS MMS Series UPS can be configured from 300kW up to 2400kW.



60Hz | 300kW TO 2400kW | 480V

PRODUCT SPECIFICATIONS

MODEL	PLUS MMS 300	PLUS MMS 600	PLUS MMS 900	PLUS MMS 1200		
RATING						
Maximum kVA	333	667	1000	1333		
Maximum kW	300	600	900	1200		
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)	372A	744A	1116A	1489A		
Current – Max. Continuous	450A	900A	1350A	1800A		
Current – Max. Non-Continuous	470A	940A	1410A	1980A		
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)	400A	800A	1200A	1600A		
Overload Capability-Mains Operation		Cont. 10 min 105%	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% 20s	75% 27s	50% 39s	25% 73s	
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	6.1kW/20,826BTU/Hr	12.2kW/41,653BTU/Hr	18.4kW/62,820BTU/Hr	24.5kW/83,646BTU/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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