



CLEANSOURCE® PLUS MMS MODULAR UPS SYSTEMS

50Hz | 300kW TO 2400kW | 380/400/415V
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.

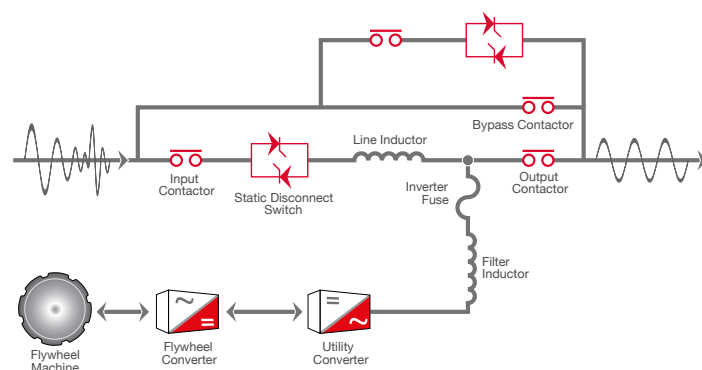
This field-proven technology is based on a highly fault tolerant IGBT architecture designed to protect all critical loads, such as data centers, industrial processes and health care applications. Stored energy will provide ride-through up to 2 minutes depending upon configuration, making the CLEANSOURCE®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

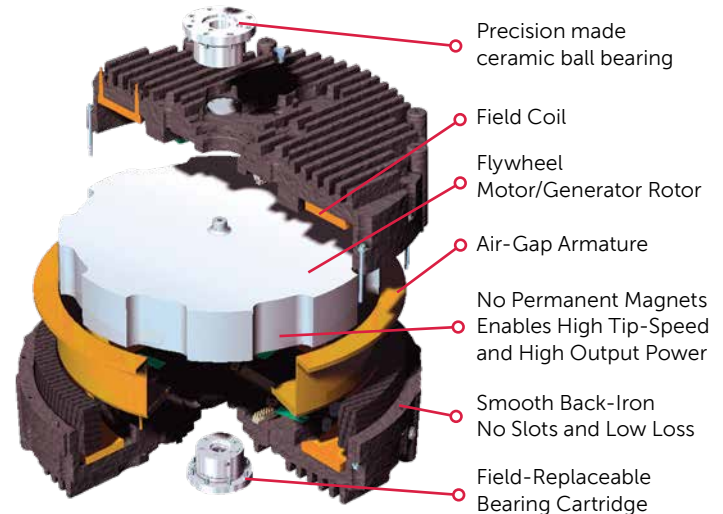
Parallel Online Architecture

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 0°C TO 40°C
- ▶ 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
- ◉ COLOUR 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

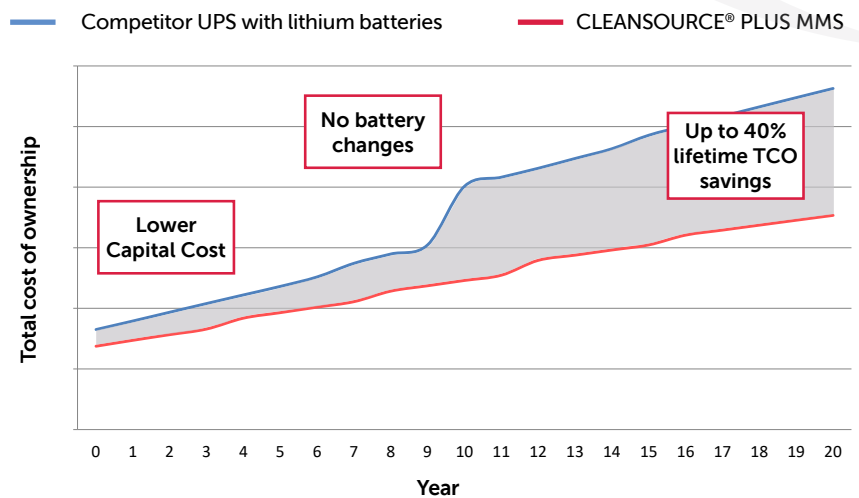
No need for dedicated cooling for batteries

► LOWER MAINTENANCE REQUIREMENTS

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

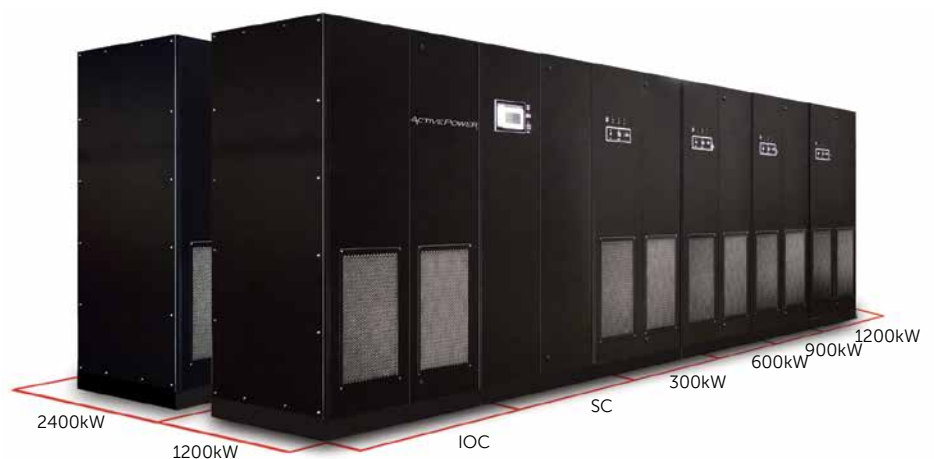
► NO BATTERY CHANGES

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.



50Hz | 300-2400 kW | 380/400/415V

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		380/400/415 VAC 3-phase, 4-wire plus ground							
Voltage Range ²		+10% / -15% (programmable)							
Frequency		50/60 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 ³	<8% at 100% load							
Current – Nominal (380 VAC)		472A		944A		1417A		1889A	
Current – Nominal (400 VAC)		449A		897A		1346A		1794A	
Current – Nominal (415 VAC)		432A		865A		1297A		1730A	
Current – Max. Continuous		530A		1060A		1590A		2120A	
Current – Max. Non-Continuous		560A		1120A		1680A		2240A	
Surge Withstand		Meets IEEE 587/ANSI C62.41							
Walk-in		1 to 15 seconds (programmable)							
OUTPUT									
Voltage		380/400/415 VAC 3-phase, 4-wire plus ground							
Voltage Regulation	Steady State	+/-1% for +/-10% input							
	Flywheel Mode	+/-1% steady state							
	Transient	+/-1% within 50 mSec for 100% load step							
Voltage Distortion ³		<1% linear loads and <5% for 100% non-linear loads							
Frequency		50/60Hz (mains synchronized) (normal operation +/- 0.2% free running)							
Slew Rate		Adjustable from 0.2Hz/second to 3.0Hz/second							
Current – Nominal (380 VAC)		506A		1013A		1519A		2026A	
Current – Nominal (400 VAC)		481A		962A		1443A		1925A	
Current – Nominal (415 VAC)		464A		927A		1391A		1855A	
Overload Capability-Mains Operation				Cont. 105%	10 min <110%	5 min <125%	1 min <150%	10s <200%	1md. >200%
Efficiency – Energy Storage Online		97.5%							
ENERGY STORAGE									
Type		Integrated Steel Flywheel spinning at 10,000RPM							
Flywheel Run Time (% Load)				100% 20s	75% 27s	50% 40s	25% 81s		
Flywheel Recharge Time ⁴		< 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 metre							
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 (304.8m) above 3,000ft (914m)							
Emissions and Immunity		EN 62040-2							
Heat Rejection – Online		7.7kW/26,289BTU/Hr		15.4kW/52,578BTU/Hr		23.1kW/78,867BTU/Hr		30.8kW/105,156BTU/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		EN 62040-1							

¹ From grounded WYE source

² +/-10% at 380VAC

³ EN 62040-3

⁴ kW recharge value is per flywheel.



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