



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.

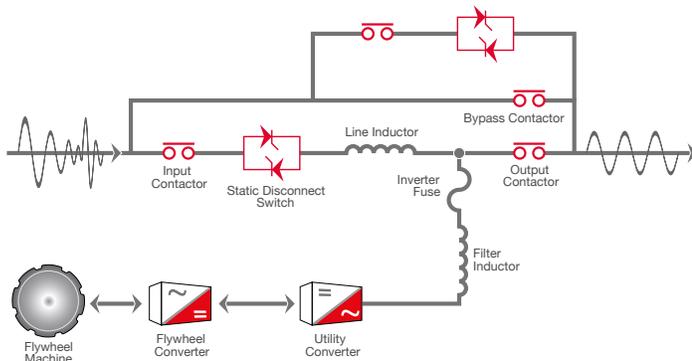
This field-proven technology is based on a highly fault tolerant IGBT architecture designed to protect all critical loads, such as data centers, industrial processes and health care applications. Stored energy will provide ride-through up to 2 minutes depending upon configuration, making the CLEANSOURCE®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

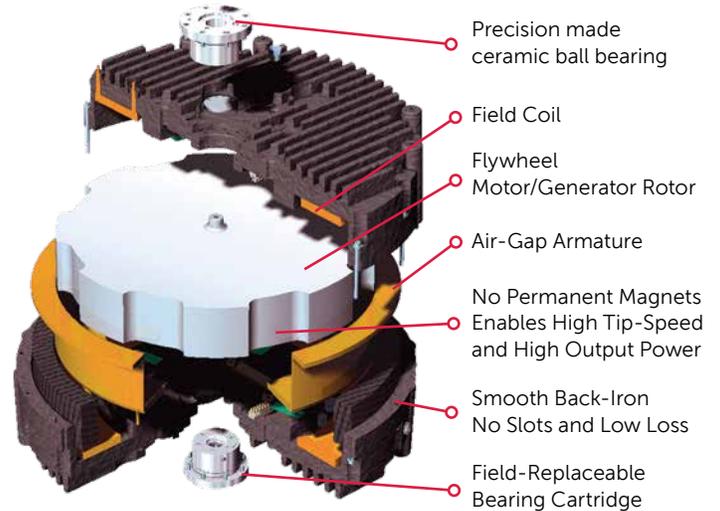
Parallel Online Architecture

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

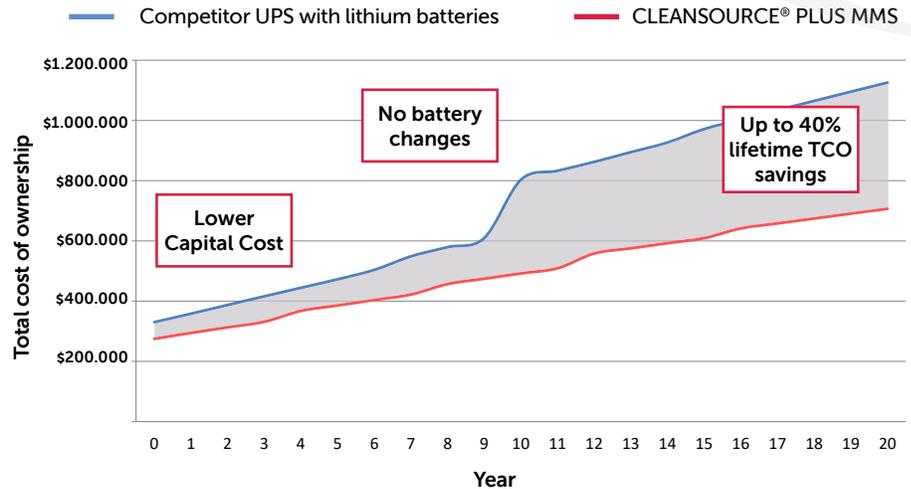
No need for dedicated cooling for batteries

► LOWER MAINTENANCE REQUIREMENTS

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

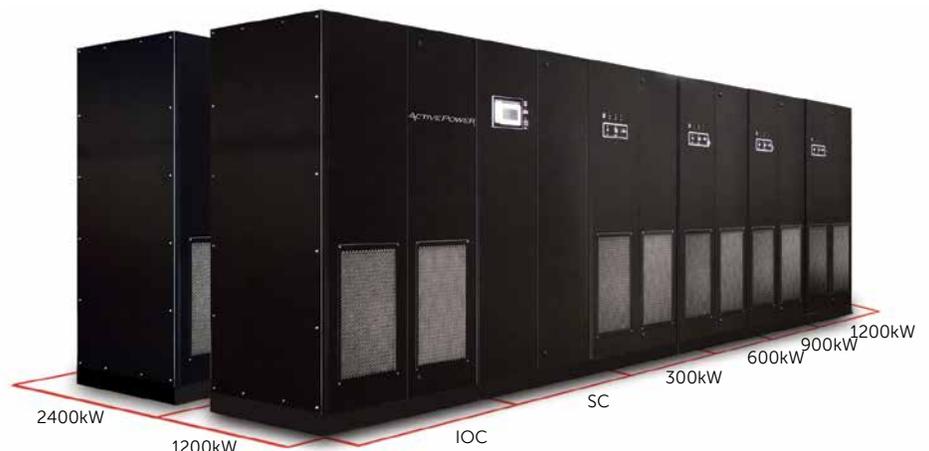
► NO BATTERY CHANGES

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.



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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