

# CLEANSOURCE® PLUS SMS MODULAR UPS SYSTEMS

50Hz | 300kW | 380/400/415V FLYWHEEL TECHNOLOGY



## CLEANSOURCE® PLUS SMS SINGLE MODULAR UPS

### Overview

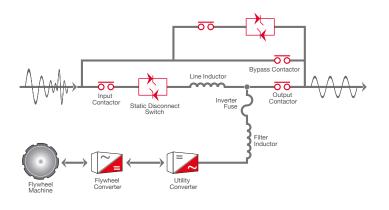
Active Power's Single Module System Flywheel UPS is the perfect combination of total cost of ownership, reliability and sustainability for any mission critical application.

Designed with highly predictable, battery-free energy storage, the Single Module System offers unmatched total cost of ownership for high availability organisations.

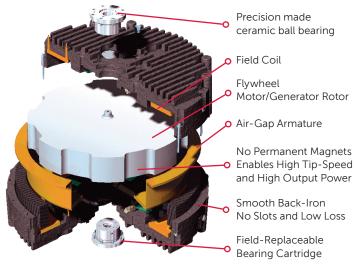
### Parallel Online Architecture

The CLEANSOURCE® PLUS SMS 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 data center facility, 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
- PARALLEL UP TO 8 SYSTEMS
- REDUNDANT FANS AND CONTROL POWER UNITS
- LOWER INSTALLATION COSTS
- LESS HEAT REJECTION
- LOWER COOLING REQUIREMENTS
- LOWER MAINTENANCE AND SERVICE
- **COST-EFFECTIVE INSTALLATION**

- COLOUR LCD TOUCH SCREEN DISPLAY
- REMOTE MONITORING CAPABILITY
- BUILT-IN POWER FACTOR CORRECTION
- GENERATOR COMPATIBILITY
- O DUAL INPUT (OPTIONAL)
- INTEGRATED MAINTENANCE BYPASS OPTION
- SEISMIC PROVISIONS CONSULT FACTORY
- 20-YEAR DESIGN LIFE
- GENSTART OPTION

# 40% TCO SAVINGS

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

**12**x

# LESS LIKELY TO FAIL

MOST RELIABLE ENERGY STORAGE SYSTEM

MINIMISE RISK AND DISRUPTION FROM MAINTENANCE AND REPLACEMENT

**G** LESS CARBON EMISSIONS

OVER 40% LESS CARBON EMISSIONS OVER 20 YEARS TO HELP YOU ACHIEVE YOUR SUSTAINABILITY GOALS CLEANSOURCE® PLUS SMS 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

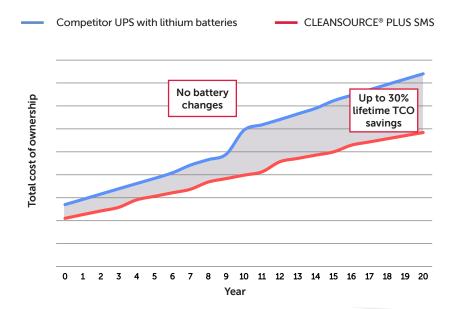
No need for dedicated cooling for batteries

### **► LOWER MAINTENANCE REQUIREMENTS**

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

### **▶** NO BATTERY CHANGES

Integrated flywheel with 20-year life.



### **PRODUCT SPECIFICATIONS**

Maximum kVA  Maximum kVA  Maximum kW  INPUT  Voltage!  Voltage Range²  Frequency³  Frequency³  Harmonic Current Distortion  Hornia (380 VAC)  Current – Nominal (380 VAC)  Current – Nax. Continuous  Surge Withstand  Walk-in  Internal Back Feed Protection  Voltage Regulation  Frequency  Steady State  Flywheel Mode  Transient  Voltage Distortion  Voltage Distortion  Voltage Paguation  Frequency  Steady State  Flywheel Mode  Transient  Voltage Distortion  Voltage Range  Steady State  Flymheel Mode  Transient  Voltage Distortion  Voltage Prequency  Load Power Factor Range  Sol A  Adjustable from 0.2Hz/second  Current – Nominal (380 VAC)  Current – Nominal (380 VAC)  Outpent  Voltage Prequency  Steady State  Flywheel Mode  Transient  Voltage Distortion A  John Carrent								
Naximum kW   300   INPUT   Voltage¹   380/400/415V VAC 3-phase, 4-wire plus ground   410% / -15% at 400/415V (programmable)   Frequency³   50 Hz +/- 10% maximum (programmable)   +/- 3% (default)   Power Factor   0.99 at rated load and nominal voltage   42% at 100% load   Ostrotron   Non-linear¹   48% at 100% load   Current - Nominal (380 VAC)   472A   Current - Nominal (415 VAC)   432A   Current - Nominal (415 VAC)   432A   Current - Max. Continuous   530A   Current - Max. Continuous   530A   Current - Max. Non Continuous   560A   Surge Withstand   Meets IEEE 587/ANSI C62.41   Walk-in   1 to 15 seconds (programmable)   Internal Back Feed Protection   Yes   OUTPUT   Voltage   Steady State   +/-1% for +/-10% input   +/-1% steady state   Transient   +/-1% within 50 mSec for 100% load step   4/8 within 50 mSec for 100% load step   4/8 within 50 mSec for 100% load step   4/8 within 50 mSec for 100% load step   4/9 with IGBT switching   50Hz (mains synchronized)   (normal operation +/- 0.2% free running)   Load Power Factor Range   0.7 lagging / 0.9 leading without derating   Slew Rate   Adjustable from 0.2Hz/second   Current - Nominal (380 VAC)   48IA   Current - Nominal (415 VAC)   48IA   Current - Nominal (415 VAC)   464A   Cont:   105%   100 min:   410%   5 min:   4.125%   1 min:   4.150%   100%	RATING							
Notage   380/400/415V VAC 3-phase, 4-wire plus ground   10%   15% at 400/415V (programmable)   10%   10	Maximum kVA		333					
Voltage¹ Voltage Range² +10% / -15% at 400/415V (programmable) Frequency³ 50 Hz +/- 10% maximum (programmable) +/- 3% (default) Power Factor 0.99 at rated load and nominal voltage Harmonic Current Distortion Non-linear⁴ <8% at 100% load Current - Nominal (380 VAC) Current - Nominal (400 VAC) Current - Nominal (415 VAC) Current - Max. Continuous Savage Withstand Walk-in Internal Back Feed Protection  OUTPUT  Voltage  Steady State Voltage Regulation Flywheel Mode Transient  Voltage Distortion⁴  Steady State Voltage Distortion⁴ Frequency Load Power Factor Range Slew Rate Current - Nominal (380 VAC)  Agage Current - Nominal (400 VAC) Current - Max. Continuous Savage Withstand Meets IEEE 587/ANSI C62.41  Voltage Regulation Flywheel Mode Transient  Voltage Regulation Flywheel Mode Transient  Voltage Distortion⁴ Cyk (inear loads and Cyk (inear loads and Cyk (inear loads and Cyk (inear loads)) Current - Nominal (380 VAC) Current - Nominal (380 VAC) Current - Nominal (400 VAC) Current - Nominal (415 VAC)  Voltage Nate  Current - Nominal (415 VAC)  Current - Nominal (415 VAC)  Cont: 10 min: 105% 10 min: 110% 150% 105: 2000% UPS Load  UPS Load  Zyk at 400/415 VAC 3-phase, 4-wire plus ground  1 to 15 seconds (programmable)  2 to 4/4 (inear loads and Cyk (inear loads a	Maximum kW		300					
Voltage Range²	INPUT							
Frequencys	Voltage <sup>1</sup>							
Prequency  Harmonic Current Distortion  Linear load	Voltage Range <sup>2</sup>		+10% / -15% at 400/415V (programmable)					
Harmonic Current Distortion Non-linear <sup>4</sup> Current – Nominal (380 VAC)  Current – Nominal (400 VAC) Current – Nominal (415 VAC)  Current – Nominal (415 VAC)  Current – Max. Continuous  Current – Max. Non Continuous  Sidoa  Surge Withstand Walk-in Internal Back Feed Protection  OUTPUT  Voltage  Steady State Voltage Regulation Flywheel Mode Transient Flywheel Mode Transient Flywheel Mode Inverter  PWM with IGBT switching Frequency Load Power Factor Range  Slew Rate  Current – Nominal (380 VAC)  Current – Nominal (380 VAC)  Current – Nominal (415 VAC)  Adjustable from 0.2Hz/second  Current – Nominal (400 VAC)  Current – Nominal (415 VAC)  Current –	Frequency <sup>3</sup>							
Current – Nominal (380 VAC) Current – Nominal (400 VAC) Current – Nominal (415 VAC) Current – Nominal (415 VAC) Current – Max. Continuous Current – Max. Non Continuous Signature Withstand Walk-in Internal Back Feed Protection  OUTPUT  Voltage  Steady State Voltage Regulation Flywheel Mode Transient Flywheel Mode Flywheel Mode Transient Voltage Distortion4 Inverter Frequency Load Power Factor Range Current – Nominal (380 VAC) Current – Nominal (415 VAC)  Current – Nominal (410 VAC) Current – Nominal (410 VAC) Current – Nominal (415 VAC)  Overload Capability-Mains Operation Ups Load	Power Factor	Power Factor		0.99 at rated load and nominal voltage				
Current - Nominal (380 VAC)	Harmonic Current	Linear load	<2% at 100% load					
Current – Nominal (400 VAC) Current – Nominal (415 VAC) Current – Nominal (415 VAC) Current – Max. Continuous S30A Current – Max. Non Continuous Sirge Withstand Walk-in Internal Back Feed Protection OUTPUT  Voltage  Steady State Flywheel Mode Transient Voltage Distortion4 Inverter Frequency Load Power Factor Range Slew Rate Current – Nominal (400 VAC) Current – Nominal (415 VAC) Current – Nominal (415 VAC)  Overload Capability-Mains Operation UPS Load  Urs Load  Current – Nominal (400 VAC) UPS Load  Urs Load  U	Distortion	Non-linear <sup>4</sup>	<8% at 100% load					
Current – Nominal (415 VAC) Current – Max. Continuous Current – Max. Non Continuous Signature Withstand Walk-in Internal Back Feed Protection  OUTPUT  Voltage  Steady State Voltage Regulation Voltage Distortion4 Inverter Frequency Load Power Factor Range Slew Rate Current – Nominal (415 VAC) Current – Nominal (415 VAC)  Current – Nominal (415 VAC)  Overload Capability-Mains Operation  Current – Nominal (415 VAC)  UPS Load	Current - Nominal (3	Current - Nominal (380 VAC)		472A				
Current – Max. Continuous Current – Max. Non Continuous Sirge Withstand Walk-in Internal Back Feed Protection  OUTPUT  Voltage  Steady State  Flywheel Mode Transient  Voltage Distortion4 Inverter  Frequency Load Power Factor Range Slew Rate  Current – Nominal (380 VAC) Current – Nominal (415 VAC)  Current – Nominal (415 VAC)  Overload Capability-Mains Operation  Current – Nominal (415 VAC)  Overload Capability-Mains Operation  Steady State  1 to 15 seconds (programmable)  Ho 15 seconds (programmable)  It o 15 seconds (programmable)  It	Current – Nominal (4	Current - Nominal (400 VAC)			449A			
Current – Max. Non Continuous  Surge Withstand  Meets IEEE 587/ANSI C62.41  Walk-in  Internal Back Feed Protection  OUTPUT  Voltage  Steady State  Flywheel Mode  Transient  Voltage Distortion4  Inverter  Frequency  Load Power Factor Range  Slew Rate  Current – Nominal (380 VAC)  Current – Nominal (415 VAC)  Current – Nominal (415 VAC)  Overload Capability-Mains Operation  Ves  Meets IEEE 587/ANSI C62.41  It in 15 seconds (programmable)  Yes  380/400/415 VAC 3-phase, 4-wire plus ground  4-V-1% for +/-10% input  +/-1% steady state  1-1% within 50 mSec for 100% load step  11% linear loads and 25% for 100% non-linear loads  10min synchronized) (normal operation +/- 0.2% free running)  10min sold Adjustable from 0.2Hz/second  20min sold Adjustable from 0.2Hz/second  20min sold Adjustable from 0.2Hz/second	Current – Nominal (4	432A						
Surge Withstand Walk-in Internal Back Feed Protection  OUTPUT  Voltage  Steady State Voltage Regulation Voltage Distortion  Flywheel Mode Inverter  Frequency  Load Power Factor Range Slew Rate  Current – Nominal (380 VAC)  Current – Nominal (415 VAC)  Current – Nominal (415 VAC)  Overload Capability-Mains Operation  Meets IEEE 587/ANSI C62.41  1 to 15 seconds (programmable)  1 to 15 seconds (programmable)  Yes  380/400/415 VAC 3-phase, 4-wire plus ground  4-wire plus ground  1 steady State 4/-1% for +/-10% input 4/-1% steady state Transient 4/-1% within 50 mSec for 100% load step  <1% linear loads and 5% for 100% non-linear loads  Non-linear loads  Inverter PWM with IGBT switching  50Hz (mains synchronized) (normal operation +/- 0.2% free running)  Load Power Factor Range 3.7 lagging / 0.9 leading without derating Adjustable from 0.2Hz/second  to 3.0Hz/second  Current – Nominal (400 VAC) 481A  Cont: 10 min: 5 min: 1 c155% 1 min: 2 c200% Immediate: 2 c200% UPS Load  UPS Load	Current – Max. Contir	530A						
Walk-in	Current – Max. Non Continuous		560A					
Internal Back Feed Protection  OUTPUT  Voltage  Steady State	Surge Withstand		Meets IEEE 587/ANSI C62.41					
OUTPUT       Voltage       Steady State       H / -1% for + / -10% input       Voltage Regulation       Flywheel Mode	Walk-in		1 to 15 seconds (programmable)					
Voltage  Steady State	Internal Back Feed Protection		Yes					
Steady State	OUTPUT							
Voltage Regulation Flywheel Mode +/-1% steady state  Transient +/-1% within 50 mSec for 100% load step  Voltage Distortion4 <1% linear loads and <5% for 100% non-linear loads  Inverter PWM with IGBT switching  Frequency 50Hz (mains synchronized) (normal operation +/- 0.2% free running)  Load Power Factor Range 0.7 lagging / 0.9 leading without derating  Slew Rate Adjustable from 0.2Hz/second  Current – Nominal (380 VAC) 506A  Current – Nominal (400 VAC) 481A  Current – Nominal (415 VAC) 464A  Cont: 10 min: <110% 5 min: <125% 10s: <200% Immediate: >200%  UPS Load 25% 50% 75% 100%	Voltage		·					
Transient +/-1% within 50 mSec for 100% load step  Voltage Distortion4 <1% linear loads and <5% for 100% non-linear loads  Inverter PWM with IGBT switching  Frequency		Steady State	+/-1% for -	+/-1% for +/-10% input				
Voltage Distortion <sup>4</sup> <1% linear loads and <5% for 100% non-linear loads	Voltage Regulation		+/-1% stea	dy state				
Voltage Distortion		Transient	·					
Frequency   50Hz (mains synchronized) (normal operation +/- 0.2% free running)	Voltage Distortion <sup>4</sup>							
Current - Nominal (380 VAC)   Some than 10 to 3.0 Hz/second to 3.0 Hz/se	Inverter							
Adjustable from 0.2Hz/second to 3.0Hz/second to 3.0Hz/second to 3.0Hz/second	Frequency							
Current - Nominal (380 VAC)   506A	Load Power Factor Range							
Current - Nominal (400 VAC)     481A       Current - Nominal (415 VAC)     464A       Cont: 10 min:      110%        5 min:      <125%	Slew Rate							
Current - Nominal (415 VAC)     464A       Cont: 105% 10 min:      110% 5 min:        5 min: 1 min:      <125% 10s:	Current - Nominal (380 VAC)		506A					
Cont: 105%	Current – Nominal (400 VAC)							
10 min:   <110%	Current – Nominal (415 VAC)		464A					
	Overload Capability-Mains Operation		10 min:     <110%			<110% <125% <150% <200%		

ENERGY STORAGE						
Туре		Integrated Steel Flywheel spinning at 10,000RPM				
Flywheel Run Time (% Load)		100%: 75%: 50%: 25%:	20s 27s 39s 73s			
Flywheel Recharge T	ime	<3 min (nominal) at 65kW				
GENERAL DATA						
Source Input		Single or Dual				
Parallel Capability		Yes, up to 8 systems				
Internal Static Bypass		Included				
Display		10-inch Colour Touch Screen Graphical Display				
Withstand Capability		65kA				
Remote Monitoring		Yes (optional)				
External Customer Contacts		8 Input and 8 Outputs (programmable)				
Internal Maintenance Bypass		Yes (optional)				
ENVIRONMENTAL						
Audible Noise		<75 dBA at 1 meter				
Temperature	Operating	32 to 104° F (0 to 40°C)				
remperature	Storage	-13 to 158° F (-25 to 70°C)				
Humidity		5% to 95% (non-condensing)				
Altitude		Up to 3,000ft (914m) 1.2°C derating for every 1,000ft above 3,000ft				
Emissions and Immunity		EN 62040-2				
Heat Rejection – Online		7.4 kW / 25,265BTU/hr				
PHYSICAL DATA						
Height		78.0in/1,981mm				
Width		58.6in/1,488mm				
Depth		34.1in/865mm				
Weight		4,799,4lbs/2,177kg	4,799,4lbs/2,177kg			
Cable Entry		Top or Bottom	Top or Bottom			
SAFETY						
EN 62040-1						

<sup>1</sup> From grounded WYE source <sup>2</sup> +/-10% at 380VAC

<sup>3</sup> 60Hz available

<sup>4</sup> EN 62040-3



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Active Power Inc. is a division of the Piller Group