



NOVA ELECTRIC



STANDARD FEATURES

- High Input Power Factor (>0.99) With Low Input THD-i (<3%)
- Adaptability For Linear and Non Linear Load
- Low Audible Noise System Design (<55db)
- Double DSP Controller For Each Individual Power Module
- Digital Control For All Major UPS Subassemblies Including Rectifier, Inverter, Battery Charger, and Battery Discharge
- IGBT Modules Rather Than Discrete Semiconductor Components Are Used In the Power Module For High Reliability
- Conformal Coated Boards For Humidity Resistance
- Available PDU With Circuit Breakers and MS Connectors
- Built In Circuit Breakers For Cabinet AC Input, AC Output and Maintenance Bypass
- Digital Paralleling Technology With Very Low Circulating Current Between Power Modules
- Front Access Cabinet With Both Top and Bottom Cable Connections
- Each Individual Module Is Configured With An Independent DSP Controller To Avoid Single Point Of Failure Risk
- Generator-Friendly Interface
- RS232, 485, and Dry Contacts All Standard
- SNMP Available

CONTACT

100 School Street,
Bergenfield, NJ 07621 USA
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NERM-Series 20-100 KVA Three Phase Modular / Redundant N+1 True Online UPS System for Harsh Environment and Shipboard



NERM 80 KVA Unit Shown with Some Optional Accessories

FORMALLY QUALIFIED TO:

- MIL-STD-1399
- MIL-STD-461
- MIL-STD-167-1A
- MIL-STD-810
- MIL-STD-740-2
- MIL-STD-2036
- MIL-STD-1474E
- MIL-S-901 Grade A

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GENERAL OVERVIEW

Nova Electric's Rugged NERM-Series True Online UPS provides a modular backup solution for military data centers, computer systems, and any other critical equipment which requires dependable backup power in harsh environment applications. These units are specifically designed for demanding applications in high shock, vibration, humidity, and EMI environments in compliance to MIL-STD-1399, MIL-STD-461, MIL-STD-167-1A, MIL-S-901D Grade A, MIL-STD-810, MIL-STD-740-2, MIL-STD-2036, and MIL-STD-1474E.

The NERM's state of the art design combines the latest IGBT three-level technology along with modern DSP Control for maximum reliability, low THD-i, and extremely high system efficiency. Modules can be stacked from 20 KVA to 100 KVA, offering hot-swappable flexibility with the highest quality. Power expansion is very simple to achieve by adding more individual power modules to the system, which can reach 100 KVA power. Two racks can be paralleled to reach 200 KVA power. These units are the ideal choice for:

- Shipboard
- Radar Systems
- Shelter Mounted
- Carrier Based Systems
- High Shock (With Shock Mounts)
- Mobile Data Centers

MODULAR HOT SWAP N+X DESIGN

Each UPS power module is designed to be hot swappable for hassle-free power expansion and system maintenance. Each module is controlled independently, thus avoiding a single point failure risk. If any individual module fails or disconnects, the system continues to operate and supply power without interruption, ensuring a high level of reliability and protection.

EASY OPERATION AND INSTALLATION

The modular flexibility of the NERM-Series UPS dramatically reduces technician time spent on installation and maintenance. A large touchscreen LCD panel ensures that users can quickly and easily access vital information.

INTELLIGENT BATTERY MANAGEMENT

Each UPS module contains a powerful 3.2 KW battery charger, and up to 4 modules can be paralleled for 12.8 KW maximum battery charging capacity. These chargers are DSP controlled with intelligent digital algorithms designed specifically to prolong battery life.

SMART PROTECTION SYSTEM

Each individual power module and the overall system are protected by both hardware and software. Protection functions include abnormal current, incorrect input or output voltage, over temperature, and short circuit. The combination of these hardware and software protection functions results in extremely high reliability, with a very user friendly interface.

HIGH RELIABILITY DESIGN

The low-loss integrated three-level IGBTs used in each NERM-Series power module result in higher efficiency and enhanced reliability due to lower heatsink temperatures.

ROBUST CABINETS

All cabinets within this system are rugged and when shock mounted will pass the barge test specified in MIL-S-901D Grade A, as well as the MIL-STD-810 and MIL-STD-167A parameters as shown herein.

EMI / INPUT RF

These units contain input Power Factor Control which allows very low input THD-I, along with high PF at the input. NERM UPS can meet MIL-STD-461 EMI requirements optionally, along with MIL-STD-1399 for input THD-I, phase balance, and other relevant characteristics.

PARTIAL OPTION SELECTION

- VRLA Batteries in Modular Drawers
- VRLA Batteries in a Separate Matching Cabinet or in an Open Rack
- Battery Circuit Breaker
- SNMP communications Card (with options for one way and bi-directional communications with enhanced security protocols such as V3.0 and **SHA-384** (384-bit) encryption)
- Battery Temperature Compensation Module
- User Replaceable Air Filter for Dusty Environments
- Parallel Operation Kit
- Input Isolation Transformer
- Alternate Remote Shutdown / EPO Configurations
- Battery Cold Start Module (Allows the UPS to Start on Battery Alone)
- Input Surge Suppression Module
- Custom / Standard Shock Isolation Mounts –selection varies based on number of UPS modules used, input transformer kVA rating (if used,) battery type, and number of batteries (shock mount selection is weight sensitive.)

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MODULE FEATURES

- Hot swap building block 20 KVA modules @ 120/208 VAC
- Independent control.
- Designed for parallel operation with active current sharing.
- Designed for (N+1) redundancy.
- Capable of hot swap.
- Automatic mechanical disconnection in case of failure or maintenance.

TRANSFORMER ISOLATION AND MANUAL BYPASS

An optional cabinet which provides for input and output isolation is required for any voltage without a neutral. This cabinet may also be used for applications with a neutral where complete Input / Output isolation is desired. This cabinet can also contain a mechanical rotary manual bypass switch used to isolate the UPS electronics enclosure for safe service while maintaining power to the load. When manual bypass is used, customer AC Input / Output will be made to this cabinet. This cabinet will also contain an input circuit breaker and EMI filtering when MIL-STD-461 requirements are specified.

An output PDU may be included in this enclosure. We can provide an array of output distribution with various customer specified MS connectors.

BATTERY CABINET

The system batteries may be housed in a separate (matching) enclosure with a protective circuit breaker or separate racks depending on run time desired. When the batteries are housed inside the matching enclosure, multiple strings will be used in parallel for highest redundancy. The batteries may be drawer mounted or on rails within the enclosure.

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PARTIAL MODEL CHART

PARTIAL MODEL	KVA	KW	INPUT / OUTPUT (VAC)	UPS CABINET DIMENSIONS (W x D x H)	BATTERY CABINET DIMENSIONS (H x W x D)	RUN TIME AT FULL LOAD	TRANSFORMER CABINET DIMENSIONS
NERM11-20K3/6-120/208-120/208	20	18	120/208	Internal to UPS Cabinet	Internal Using Standard HR1234 or Equal Batteries	40x 9 AH Cells for 2 Minutes at 18 kW Load or 80x 9 AH Cells for 10 Minutes at 18 kW Load	Available for Applications Requiring Isolation and for EMI and PDU Requirements
NERM11-40K3/6-120/208-120/208	40	36	120/208	23.6 x 35.5 x 63"	23.6 x 35.5 x 63"	40x 26 AH Cells for 5 Minutes at 36 KW Load	Available for Applications Requiring Isolation and for EMI and PDU Requirements
NERM11-60K3/6-120/208-120/208	60	54	120/208	23.6 x 35.5 x 63"	23.6 x 35.5 x 63"	60x 26 AH Cells for 5 Minutes at 54 KW Load	Available for Applications Requiring Isolation and for EMI and PDU Requirements
NERM11-80K3/6-120/208-120/208	80	72	120/208	Two Cabinets Needed - Each Cabinet is 23.6 x 35.5 x 63"	23.6 x 35.5 x 63"	80x 26 AH Cells for 5 Minutes at 72 KW Load	Available for Applications Requiring Isolation and for EMI and PDU Requirements
NERM11-100K3/6-120/208-120/208	100	90	120/208	Two Cabinets Needed - Each Cabinet is 23.6 x 35.5 x 63"	23.6 x 35.5 x 63"	100x 26 AH Cells for 5 Minutes at 90 KW Load	Available for Applications Requiring Isolation and for EMI and PDU Requirements
NERM11-20K3/6-450(D)-120/208	20	18	450 Delta Input / 120/208 Wye Output	Internal to UPS Cabinet	Internal	40x 9 AH Cells for 2 Minutes at 18 kW Load or 80x 9 AH Cells for 10 Minutes at 18 kW Load	23.6 x 35.5 x 63"
NERM11-40K3/6-450(D)-120/208	40	36	450 Delta Input / 120/208 Wye Output	23.6 x 35.5 x 63"	23.6 x 35.5 x 63"	40x 26 AH Cells for 5 Minutes at 36 KW Load	23.6 x 35.5 x 63"
NERM11-60K3/6-450(D)-120/208	60	54	450 Delta Input / 120/208 Wye Output	23.6 x 35.5 x 63"	23.6 x 35.5 x 63"	60x 26 AH Cells for 5 Minutes at 54 KW Load	23.6 x 35.5 x 63"
NERM11-80K3/6-450(D)-120/208	80	72	450 Delta Input / 120/208 Wye Output	Two Cabinets Needed - Each Cabinet is 23.6 x 35.5 x 63"	23.6 x 35.5 x 63"	80x 26 AH Cells for 5 Minutes at 72 KW Load	23.6 x 35.5 x 63"
NERM11-100K3/6-450(D)-120/208	100	90	450 Delta Input / 120/208 Wye Output	Two Cabinets Needed - Each Cabinet is 23.6 x 35.5 x 63"	23.6 x 35.5 x 63"	100x 26 AH Cells for 5 Minutes at 90 KW Load	23.6 x 35.5 x 63"

All models shown available with N+X where X = the number of modules in redundancy. 100 kVA models can only have N+1. Shorter and longer battery run times on most models are available upon request.

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SPECIFICATIONS

CABINET	SIZE* (W x D x H)	WEIGHT - ESTIMATE (LBS)
UPS CABINET <small>(CAN FIT UP TO 6 MODULES)</small>	23.6" x 35.5" x 63" / 600mm x 900mm x 1600mm	600 lbs <small>(4 Modules)</small>
BATTERY CABINET	23.6" x 35.5" x 63" / 600mm x 900mm x 1600mm	800 - 1500 lbs <small>(Depends on Battery Selected)</small>
TRANSFORMER, MANUAL BYPASS , AND PDU CABINET	23.6" x 35.5" x 63" / 600mm x 900mm x 1600mm	1500 lbs <small>(60 KVA)</small>
*Add ~8" to Height and Depth when Shock Mounts are Used <small>(Mounts Add Significant Weight)</small>		
CAPACITY	20-100 KVA <small>(18 - 90 KW)</small>	
MAIN INPUT		
INPUT VOLTAGE <small>(W/NEUTRAL)</small>	120/208 VAC or 450 VAC DELTA <small>(Other Voltages Available with Optional Transformer)</small>	
INPUT FREQUENCY	60 Hz <small>(50 Hz Available)</small>	
INPUT POWER FACTOR	> 0.99 at ½ to Full Load	
INPUT CURRENT THD <small>(AT NOMINAL VOLTAGE)</small>	< 3% at ½ to ¾ Load	
INPUT VOLTAGE WINDOW	-20% to +20% @ Full Load, -40% to +20% @ 70% Load or Less	
FREQUENCY WINDOW	40-70 Hz Programmable	
BATTERY		
BATTERY VOLTAGE	± 120 VDC <small>(Nominal)</small>	
CHARGER POWER	20% of UPS kw Power Rating	
CHARGER VOLTAGE PRECISION	1%	
BYPASS		
BYPASS VOLTAGE	120/208 VAC or 450 VAC DELTA <small>(Other Voltages Available with Optional Transformer)</small>	
BYPASS VOLTAGE WINDOW	-20% ~ +15%, Full Load, Settable	
BYPASS OVERLOAD CAPACITY <small>(PLEASE ADVISE US OF ANY INTENDED MOTORS IN THE LOAD)</small>	< 125%, Long Term Operation <small>(2 Hours Maximum)</small>	
	125% < load < 130%, for More than 1 Hour	
	130% < load < 150%, for More than 6 Minutes	
	> 1000%, for More than 100ms	
OUTPUT		
OUTPUT VOLTAGE	120/208 VAC or 450 VAC DELTA <small>(with Optional Transformer)</small>	
VOLTAGE PRECISION	± 1.5% <small>(Balanced Load)</small> , ± 3% <small>(Unbalanced Load)</small>	
VOLTAGE THD	THD < 2% <small>(Linear Load)</small> , THD < 5% <small>(Nonlinear Load)</small>	
POWER FACTOR	0.8 Lead to Lag	
PHASE TOLERANCE	120° ± 0.5° <small>(Balanced and Unbalanced Load)</small>	
CREST FACTOR	3:1	
OVERLOAD CAPABILITY	Up to 105%, Continuous Operation Up to 110%, Transfer to Bypass after 1 Hour Up to 125%, Transfer to Bypass after 10 Minutes Up to 150%, Transfer to Bypass after 1 Minute > 150%, Transfer to Bypass after 200 ms	
SYSTEM		
SYSTEM EFFICIENCY	Normal Mode: 90% <small>(~89% with Transformers)</small>	
	ECO Mode: 99%	
BATTERY MODE EFFICIENCY	90%	
DISPLAY	LCD+LED, Touch Screen and Keyboard	
IP CLASS	IP20 Standard – Higher IP Ratings / Drip Shield Available Optionally	
INTERFACE <small>(COMMUNICATION PORTS)</small>	RS232, RS485, Dry Contacts, SNMP Card, EPO, Generator Interface	
INSTALLATION/CONNECTION	Top or Bottom Cable Connection <small>(Custom Available)</small>	
OPERATION TEMPERATURE	0-40°C <small>(to 50°C with 15% Derating)</small>	
STORAGE TEMPERATURE <small>(ELECTRONICS)</small>	-25°C TO +70°C <small>(Depends on Battery Rating)</small>	
RELATIVE HUMIDITY	0-95% <small>(Non-Condensing)</small>	
NOISE <small>(dB)</small>	< 55 dBa at 5 ft	

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SYSTEM COMPLIANCE

Select models in the NERM product family were formally tested and qualified as follows:

MIL-STD-1399 Section 300B: For Type I Apparatus

- Voltage and Frequency Tolerance Test
- Voltage and Frequency Transient Tolerance and Recovery Test
- Voltage Spike Test
- Emergency Condition Test
- Grounding Test
- User Equipment Power Profile Test
- Current Waveform Test
- Voltage and Frequency Modulation Test
- Simulated Human Body Leakage Current Tests for Personnel Safety

MIL-STD-740-2: Structureborne Vibratory Acceleration Measurements for Type III Equipment

Additional Ruggedization to meet MIL-STD-167, MIL-STD-810, and MIL-STD-2036: The UPS System's construction is extremely robust, and ruggedized throughout. All components and modules within the unit are mounted using additional steel brackets and heavy-duty stainless-steel hardware, which is then further secured using Loctite and RTV where required. All boards are conformal-coated (Acrylic MIL-I-46058 Type R) for maximum resistance to potential condensation and fungus growth.

MIL-STD-167-1A:

- Exploratory Vibration Test
- Variable Frequency Vibration Test
- Endurance Vibration Test

MIL-S-901D Grade A

MIL-STD-810H:

- Operational Atmospheric Pressure Extremes per MIL-STD-810H, Method 500.6, Procedure II
- Air Temperature – Internal Mounted Equipment per MIL-STD-810H, Method 502.7, Procedure II (Low Temperature) and 501.7 Procedure II (High Temperature)
- Operational Vibration Test per MIL-STD-810H, Method 514.6
- Temperature – Transportation and Storage Extremes per MIL-STD-810H Methods 501.7 and 502.7 Procedure I
- Atmospheric Pressure Extremes per MIL-STD-810H, Method 500.6, Procedure I
- Rapid Decompression per MIL-STD-810H, Method 500.6, Procedure III
- Operational Humidity per MIL-STD-810H, Method 507

MIL-STD-2036: Operational Humidity

MIL-STD-1474E: Airborne Noise Production

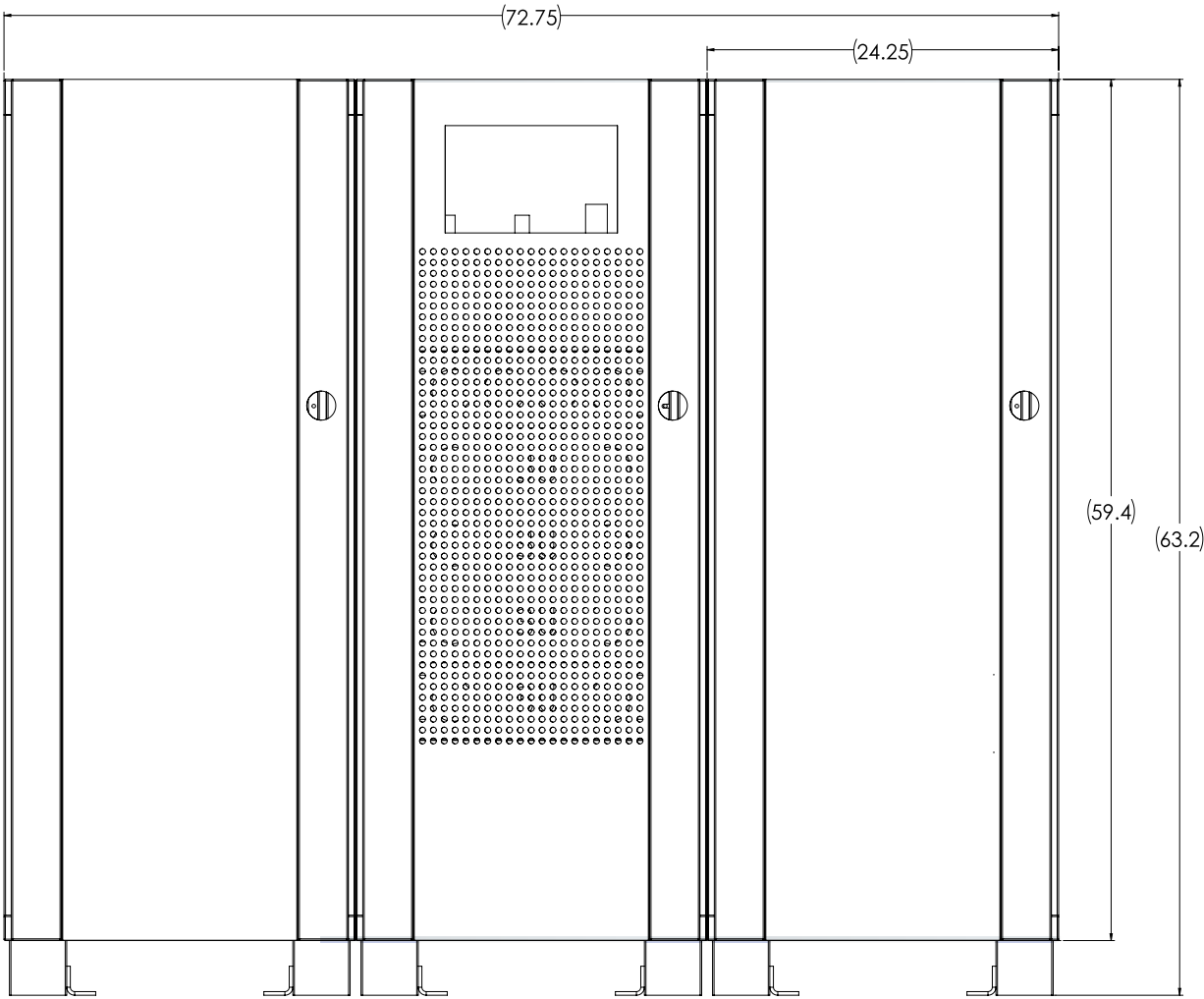
MIL-STD-461G:

- CE101 Conducted Emissions 30 Hz to 10 kHz AC Power Leads from Ship Power
- CE102 Conducted Emissions 10 kHz to 10 MHz AC Power Leads
- CS106 Conducted Susceptibility Transients Modified AC Power Leads from Ship Power (Tested as part of CS116 per MIL-STD-461G)
- CS114 Conducted Susceptibility Bulk Cable Injection 10 kHz to 200 MHz
- CS116 Conducted Susceptibility, Damped Sinusoidal Transients, 10 kHz to 100 MHz
- RE101- Radiated Emissions, Magnetic Field. 42 (compliant at relaxed distances of 40 cm above the UPS)
- RE102 – Radiated Emissions, Electric Field, 10 kHz to 18 GHz 55 Antenna Positions
- RS101 – Radiated Susceptibility, Magnetic Field
- RS103 Radiated Susceptibility, Electric Field, 2 MHz to 18 GHz

Please note: Not all models and choices of input voltages and output voltages shown in the model chart have been formally tested for each of the following MIL-STD-461G parameters shown above. In such cases, Nova cannot guarantee full compliance without a formal testing program for your specific UPS configuration, available optionally. Please consult the factory for details.

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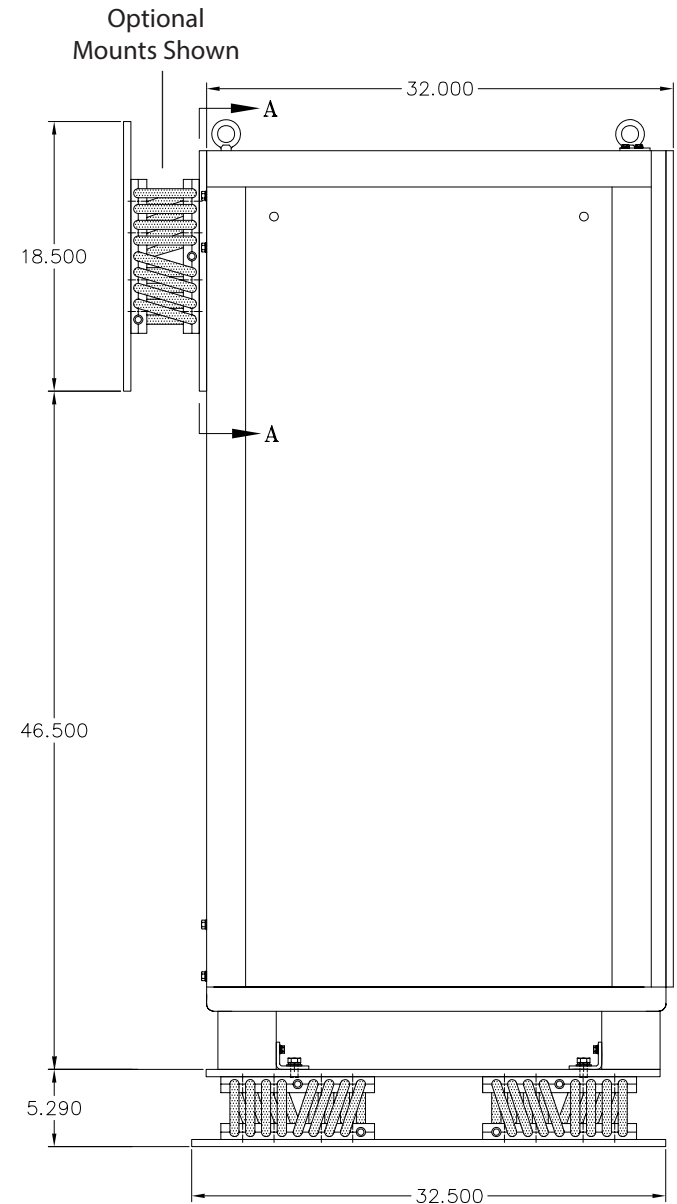
OUTLINE DRAWING



Transformers
Manual Bypass Circuitry
PDU Components (Optional)
Main I/O Connections

Electronics
Enclosure

Battery
Enclosure



Optional Mounts Shown





RUGGED AC POWER SYSTEMS



SELECT UNITS QUALIFIED TO MIL-STD-810, MIL-S-901, MIL-STD-1399, MIL-STD-461, MIL-STD-167, MIL-STD-740, RTCA/DO-160, AND MORE

RUGGED TRUE ONLINE UPS



500 W – 500+ KW

Rack Mount, Bulkhead Mount, and Freestanding

Single and Three Phase

50, 60, and 400 Hz.

PURE SINEWAVE DC-AC INVERTERS



100 W – 500+ KW

Rack Mount, Bulkhead Mount, and Freestanding

Single and Three Phase

50, 60, and 400 Hz.

SOLID-STATE FREQUENCY CONVERTERS



100 W – 500+ KW

Rack Mount, Bulkhead Mount, and Freestanding

Single and Three Phase

50, 60, and 400 Hz.

POWER DISTRIBUTION UNITS (PDUs)



Basic, Switched, Auto-Transfer Switching, and Metered Configurations

Rack Mount, Bulkhead Mount, and Freestanding

Single and Three Phase

CUSTOM EMI FILTERS



For MIL-STD-461 Compliance

Rack Mount, Bulkhead Mount, and Freestanding

Single and Three Phase

RUGGED PORTABLE TRANSFORMERS



100 W – 500+ KW

Rack Mount, Bulkhead Mount, and Freestanding

Single and Three Phase

EXTERNAL MAINTENANCE BYPASS SWITCHES (MBSSs)



Rack Mount, Bulkhead Mount, and Freestanding

Single and Three Phase

CUSTOM DESIGNS



Designed & Built to Spec

Integrated AC & DC Capabilities

Multiple Outputs

RELIABLE AC POWER WHEN AND WHERE YOU NEED IT SEVERE ENVIRONMENT PRODUCTS



- AIRBORNE
- SHIPBOARD
- MOBILE
- RACK MOUNT & FREESTANDING

- 50, 60, AND 400 Hz
- AIR & WATER COOLED
- SINGLE AND THREE PHASE
- LIGHTWEIGHT DESIGNS

