



SynQor®

UPS

UPS-1500-S-2S

MILITARY-GRADE UNINTERRUPTIBLE POWER SUPPLY

1500 VA/ 1250 W Output Power	80-265 Vrms 47-65 Hz or 47-800 Hz AC Input Voltage Options	115 Vrms or 230 Vrms 50 Hz, 60 Hz or 400 Hz AC Output Voltage Options	28 Vnom DC Input Voltage Option	500 W or 1250 W DC Output Voltage Option	>10 Min. - 2S Battery Run Time
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Sealed Construction, Ultra Low Weight, Compact Size

DESIGNED & MANUFACTURED IN USA



Shallow Rack Mount!

SynQor's Military-Grade Uninterruptible Power Supply units are designed for the extreme environmental and demanding electrical conditions of Military/Aerospace applications. SynQor's UPS incorporates field proven high efficiency designs and rugged packaging technologies. This UPS will accept a wide range of input voltage and frequency values while delivering a well-conditioned AC output to the load. The use of lithium polymer batteries permits the lowest profile and lowest weight solution in its power class. It is designed and manufactured in SynQor's USA facilities to comply with a wide range of military standards. Options include two DC outputs and the ability to also draw power from a military standard 28 VDC input.

Combine Up to 3 units for Higher Power, Voltage and/or 3-Phase AC output

Features

- Shallow rack mount unit (17.00"W x 13.59"D x 3.40"H)
- Sealed, weather-proof, shock-proof construction
- Hot swappable internal battery pack (lithium polymer)
- >10 minute run-time at full power
- 1250 W (1500 VA) output power
- Full power operation: -20 °C to +50 °C
- Universal AC input: 80-265 VAC; 47-65 Hz
- Power factor correction at AC input
- Dual input (AC and optional DC)
- True on-line double conversion
- Cold start with no AC or DC input connections
- Pure sinusoidal AC output voltage (115 VAC, 60 Hz)
- Handles 0.0—1.0 power factor loads and non-linear loads
- Up to 3 units can be combined for higher power, voltage or a 3-Phase AC output
- User I/O and Configuration signal ports
- Low weight: 33 lbs. (including battery)

In-Line Manufacturing Process

- AS9100 and ISO 9001 certified facility
- Full component traceability

Options

- DC input (28 Vnom) for dual source
- Wide-range AC input frequency: 47 Hz to 800 Hz
- 115 Vrms or 230 Vrms AC output
- 50 Hz, 60 Hz, or 400 Hz output
- DC1: Auxiliary isolated DC output (up to 500 W)
- DC2: High power DC output (up to 1250 W) parallelable for higher power
- Shipboard version with floating neutral wire

Specification Compliance Pending

UPS-1500 units are designed to meet:

- MIL-STD-1399-300B - Interface Std for Shipboard Systems
- MIL-STD-810G - Environmental Engineering Considerations
- MIL-STD-461F - Electromagnetic Interference
- MIL-STD-704F - Aircraft Electrical Power Characteristics
- MIL-STD-1275D - Vehicle Electrical Power Characteristics

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Technical Specification

INPUT CHARACTERISTICS

Operating AC Input

Voltage	80-265 Vrms*
Frequency	47-65 Hz (47-800 Hz Optional)
Input Power Factor	>0.98 at 47-65 Hz >0.97 at 400 Hz >0.93 at 800 Hz

Maximum Input Current Continuous	20 A (full load, 85 Vrms)
AC Input Circuit Breaker Rating (* Power Derating to 80% below 90Vrms)	25 A

Operating DC Input (Optional)

Voltage	22-33 V
Continuous Maximum Input Current	62 A (full load, 22 V)
Transient Maximum Input Current	75 A

OUTPUT CHARACTERISTICS

Total Output Power Continuous	1250 W (1500 VA)
Maximum DC1 Output Power	510 W
Maximum DC2 Output Power	1250 W

(Note: Available AC power is reduced by power delivered to the DC output)

AC Output

AC Output Waveform	Pure Sinusoidal
Voltage	115 Vrms ± 3% 230 Vrms ± 3%
Frequency	60 Hz ± 0.5% 50 Hz ± 0.5% 400 Hz ± 0.5%
Peak Load Current	26 A (115 Vrms) 13 A (230 Vrms)
Load Power Factor	0-1.0 (leading or lagging)
Total Harmonic Distortion	2% (1000 W resistive load)

DC1 Output (optional)

Voltage Regulation (Over Load & Temperature)	± 3%
Common Voltage/Power combinations (DC1) (Other Options Available)	12 V at 42 A =504 W 15 V at 34 A =510 W 24 V at 21 A =504 W 28 V at 18 A =504 W 40 V at 12.5 A =500 W 50 V at 10 A =500 W

DC2 Output (optional)

Voltage Setpoint	± 3%
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No Sharing

Voltage Regulation (Over Load & Temperature)	-2%
Common Voltage/Power combinations (DC2)	50 V at 20 A =1000 W 24 V at 50 A =1200 W 28 V at 44.6 A =1250 W

Droop Share (Output droops vs. load to allow passive sharing among modules.)

24 V Option

Voltage Regulation (Over Load & Temperature)	-15%
	26 V at 0 A 22 V at 50 A =1100 W

28 V Option

Voltage Regulation (Over Load & Temperature)	-13%
	30 V at 0 A 26 V at 48.1 A =1250 W

Specifications subject to change without notice.

ENVIRONMENTAL CHARACTERISTICS MIL-STD-810G

Temperature Methods 501.5, 502.5

Operating Temperature	-20 °C — +50 °C
Storage Temperature	-20 °C — +65 °C

Altitude Method 500.5

Operating	0 - 18,000 ft
Non-operating	0 - 40,000 ft

Environmental Tests

Shock/Drop	Method 516.6, Procedures 1,4,6
Temperature Shock	Method 503.5, Procedure 1
Vibration	Method 514.6, CAT 5, 7, 8, 9, 24
Fungus	Method 508.6
Salt Fog	Method 509.5
Sand and Dust	Method 510.5, Procedures 1,2
Rain	Method 506.5 Procedure 1
EMI	MIL-STD-461F
Humidity	Method 507.5 Procedure 2
Mechanical Vibration of Shipboard Equipment	Method 528 Procedure 1

RELIABILITY CHARACTERISTICS MIL-HDBK-217F

MTBF	100 kWhrs	MIL-217F Ground Benign, Ta=25 °C
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ELECTROMAGNETIC CAPABILITY MIL-STD-461F

CE101	30 Hz - 10 kHz
CE102	10 kHz - 10 MHz
CS101	30 Hz - 150 kHz
CS106	10 kHz - 40 GHz
CS114	10 kHz - 200 MHz
CS116	10 kHz - 100 MHz
RE101	30 Hz - 100 kHz
RE102	10 kHz - 18 GHz
RS101	30 Hz - 100 kHz
RS103	2 MHz - 40 GHz

* Regarding MIL-STD-461 CE-101, the 50 uH series inductance of a standard LISN adversely affects the input ripple of the UPS (DC input only). Such a large series source inductance (50 uH in each power lead) is not generally encountered in a 28 V DC source of such high power rating. Therefore, testing for CE-101 (DC input) was conducted with 3 different configurations: two using 50 uH LISNs and a 54 mF capacitor connected across the input to the UPS, and one using 5 uH LISNs for which no additional capacitor was added.

These configurations all passed CE-101 for all frequencies.

MECHANICAL CHARACTERISTICS

Chassis

Chassis Size	17.00"W x 13.59"D x 3.40"H
Case Material	Aluminum
Total Weight	33 lbs. (with chassis & battery)

Connectors

AC Input Connector	MS3470L14-4P
User I/O Ports	HD DB15 Female
Configuration I/O Port	HD DB15 Male
Ethernet Port	Amphenol RJF22N00, Code B
DC Input Connector	MS3470L18-8P
AC Output Connector	MS3470L14-4S
DC1 Output Connector	MS3470L14-4SW
DC2 Output Connector	MS3470L18-8S

Cooling Exhaust Fans

Sound Pressure Level (SPL)	54 dB(A)
Air Flow	0.67(m³/min) 23.7 CFM

Two fans in system, above specs are for each fan separately.

Technical Specification



High Density DB15 Female (15 Pin Connector)

Signal	PIN	Function
TX	2	RS232 DCE Device Transmit
RX	3	RS232 DCE Device Receive
GND	4, 5	Ground reference for all digital inputs and outputs
LOW_BATT	6	Open collector output where "low" indicates battery charge level <10%
ACIN_GOOD	7	Open collector output where "low" indicates AC Input voltage is within range
+5V	8	Vout with minimal current drive usable as a pull-up voltage for open collector output signals. Load must be <35 mA
ON_BATT	9	Open collector output where "low" indicates that the UPS is running on battery power.
REMOTE_START	12	Drive this line "high" with ≥ 5 mA to enable UPS outputs
SHUTDOWN	13	Drive this line "high" with ≥ 5 mA to disable UPS outputs
OUT_OK	14	Open collector output where "low" indicates AC Output voltage is within range
OVER_TEMP	15	Open collector output where "low" indicates that the UPS is at or above its maximum temperature

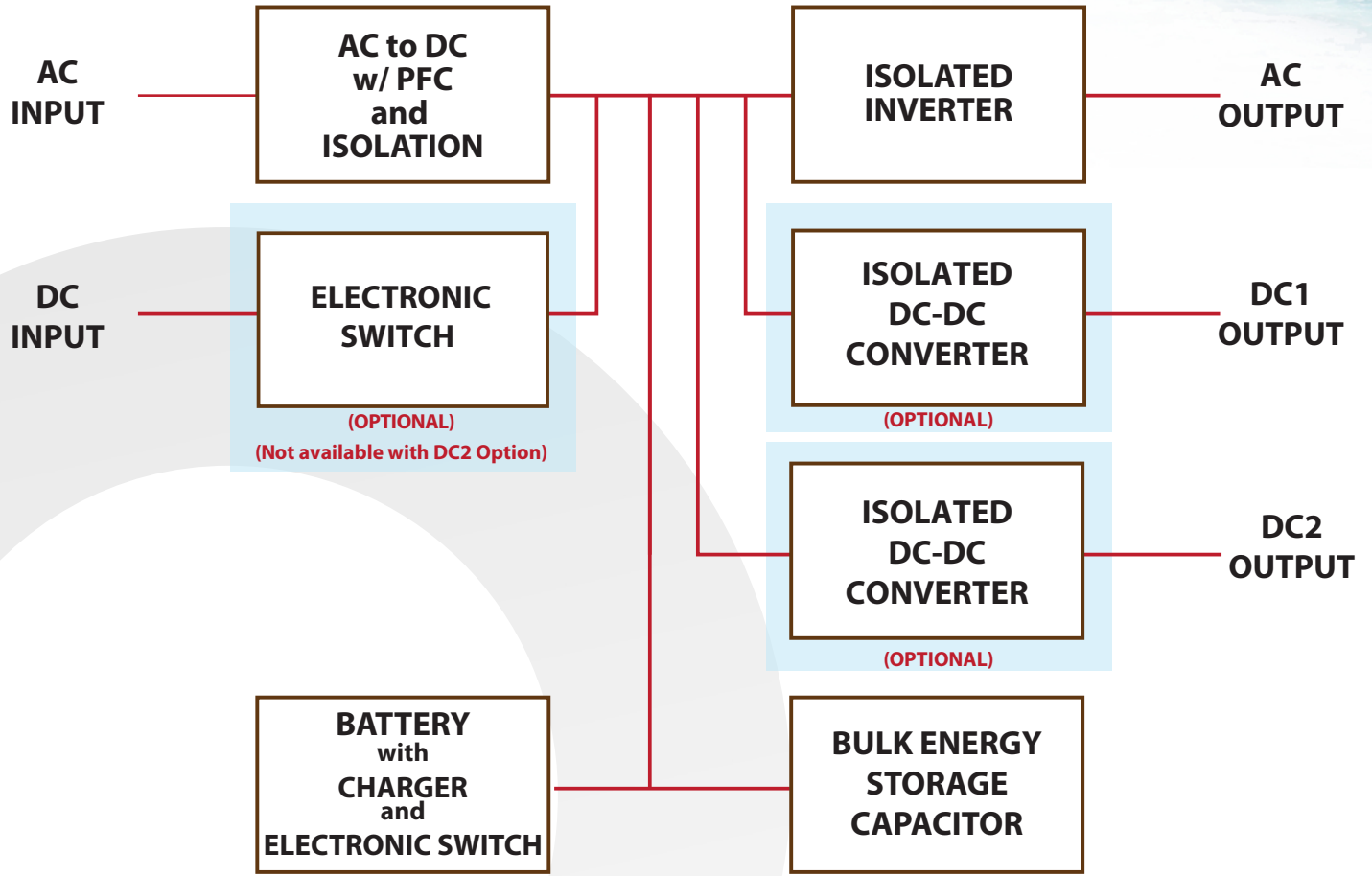
Safety & Qualifications	Pending
IEC 62133	Safety requirements for portable secondary sealed cells.
ST/SG/AC.10/11	UN Recommendations on the Transport of Dangerous Goods
UL 1642	Lithium Batteries
EN 62040-1	General and safety requirements for UPS (Does not apply to 400 Hz operation)
EN 62040-2	UPS Electromagnetic compatibility (Category C4)

LITHIUM-POLYMER BATTERY CHARACTERISTICS		
Standard 1U Battery Pack Run Time		
1250 W : 10 min	1000 W : 13 min	625 W : 21 min
Recharge Time (to 90% charge)		
Total Output Power	< 1000 W	2 hrs
Temperature Range for Recharge: 0°C to 45°C		
Internal heaters maintain battery temperature above 0°C when input power is present.		
Battery charging only enabled below +45°C.		



UPS
UPS-1500-S-2S

Block Diagram



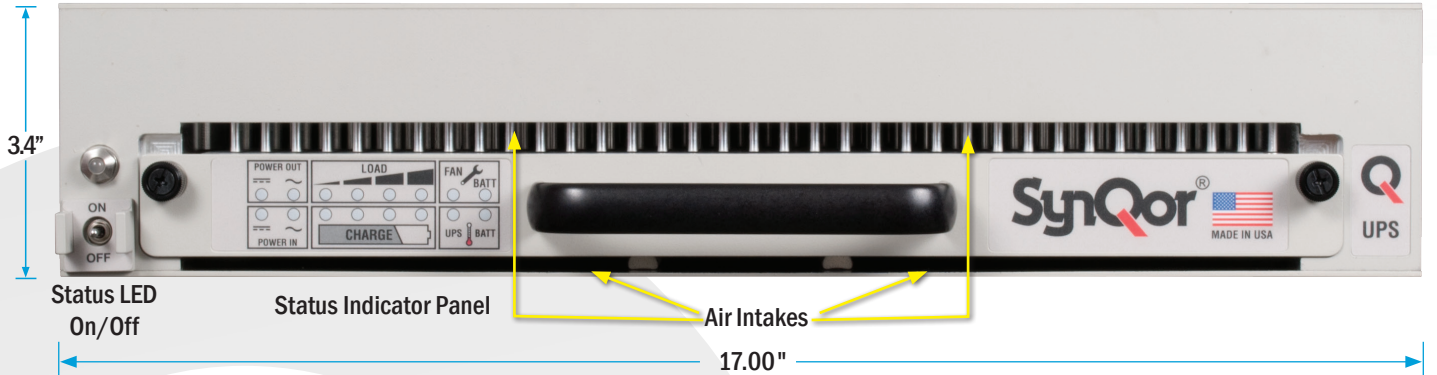


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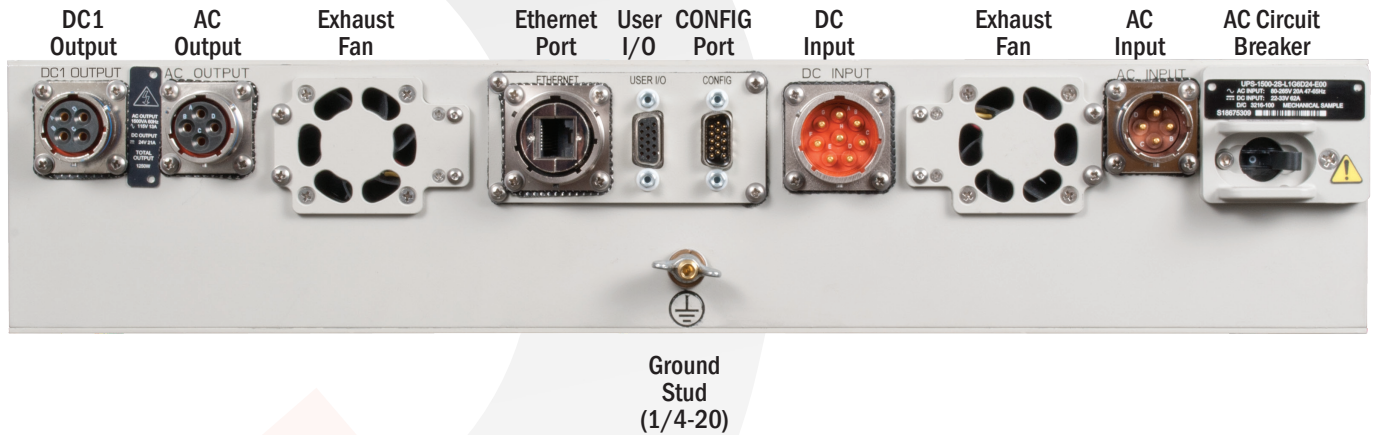
UPS
UPS-1500-S-2S

Mechanical Features

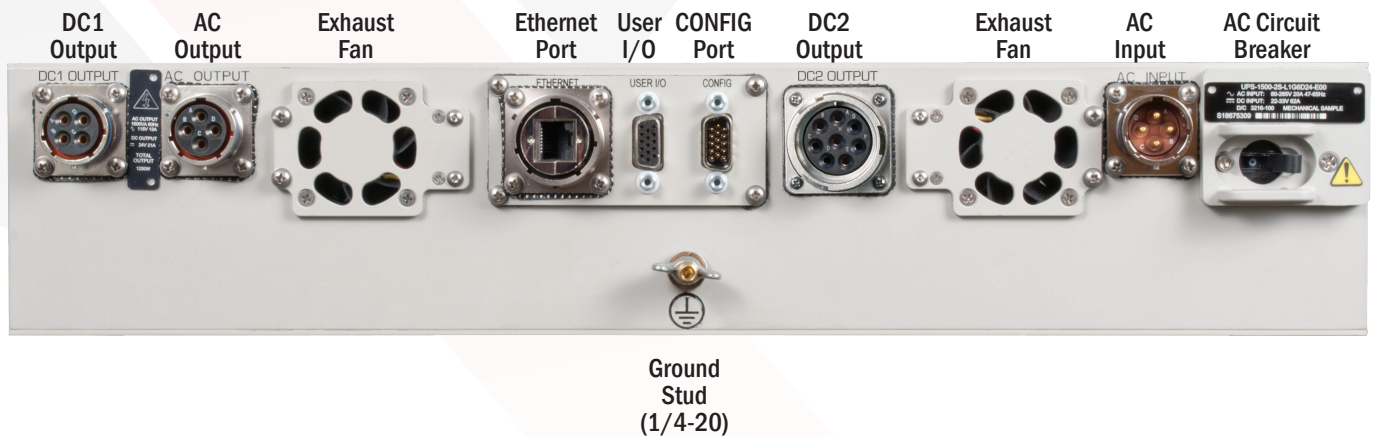
UPS-1500-S-2S Unit



UPS-1500-S-2S Unit with DC Input / DC1 Output Options

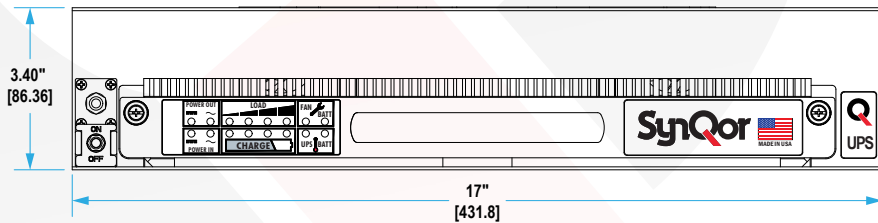
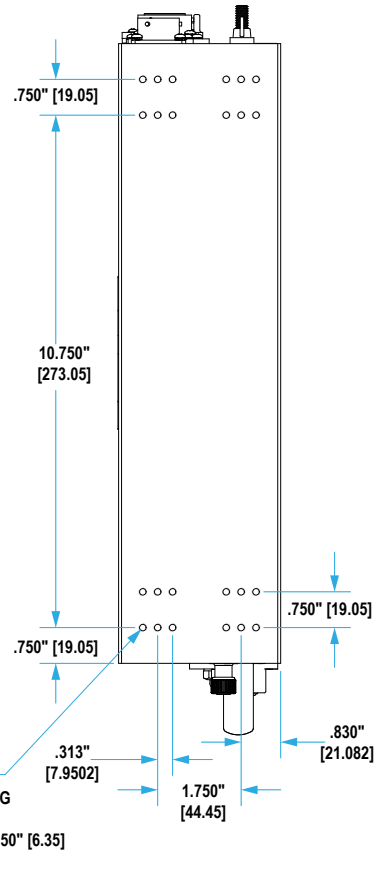
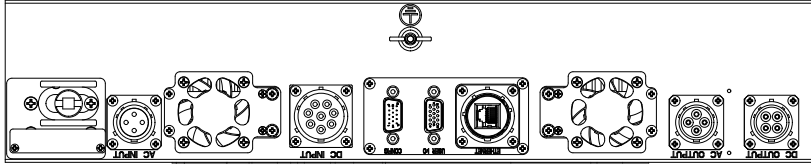


UPS-1500-S-2S Unit with DC1 Output / DC2 Output Options





Mechanical Diagrams



Accessory Options

Replacement Battery Packs	1500S Series
1U; 10 lbs. (200 Watt Hours)	BAT-0200-S-1U-000
Rail Kits	
Slide Rail Kit ²	SYN-9043
Fixed Bracket Kit ³	SYN-9041
Power Cables (10' long)	
AC Input (NEMA 5-20 Plug)	SYN-9101
AC Input (NEMA 5-15 Plug)	SYN-9104
AC Input (Hardwire)	SYN-9102
AC Input, 10' Grounded (Hardwire)	SYN-9108
AC Input, 10' UK 13 A 250 V Plug	SYN-9111
AC Input, 10', SCHUKO 16 A, 250 V-3 W Euro Plug	SYN-9112
AC Output, 10' (115 Vrms) (NEMA 5-20R Receptacle)	SYN-9131
AC Output, 10', Hardwire	SYN-9130
AC Output, 10', UK 13 A 250 V Sockets	SYN-9137
AC Output, 10', Grounded Hardwire	SYN-9138
DC Input (Ring Connectors)	SYN-9151
DC Input (Hardwire)	SYN-9152
DC Input (NATO Connector)	SYN-9154
DC1 Output (Fork Connectors)	SYN-9171
DC1 Output (Hardwire)	SYN-9172
DC2 Output (Hardwire)	SYN-9174
DC2 Output (Fork Connectors)	SYN-9175
DC2 Output (Fork Connectors)	SYN-9175
AC Output Power Strips (Circular Connector)	
6 NEMA Receptacles with Breaker (1U Rackmount & 3' Cable)	SYN-9232
6 NEMA Receptacles (1U Rackmount & 3' Cable)	SYN-9231

Notes:

- 1: Other Options also available, check the website or contact power@synqor.com for further information.
- 2: Slide Rail Kit (SYN-9043) is not recommended for ruggedized use.
- 3: Fixed Bracket Kit (SYN-9041) is required for ruggedized use



6 NEMA Receptacles with Breaker



* Contact factory for additional configuration cables.

User Communications (I/O) Cables	
HD DB15M to DB9F (RS232, 10')	SYN-9301
HD DB15M to DB15M (RS232 and Digital I/O, 10')	SYN-9305
Mil-Circular to RJ45 (Ethernet, 10')	SYN-9321
Configuration Cables (AC Output Sharing Only)	
HD DB15F to DB15F (2 Units Parallel, 3')	SYN-9311
HD DB15F to DB15F (3 Units Parallel, 6')	SYN-9315
HD DB15F to DB15F (2 Units Series, 3')	SYN-9313
HD DB15F to DB15F (3 Units 3 Phase, 6')	SYN-9317



Ordering Information

Base Models				
Model Number	Power	Battery Run-Time @Full Power (80% Power)	Height	Weight
UPS-1500-S-2S (1 Standard Battery Pack)	1250 W 1500 VA	>10 min. (>13 min.)	2S	33 lbs.

Options	
AC Output Voltage	115 Vrms, 230 Vrms
AC Output Frequency	50 Hz, 60 Hz, 400 Hz
AC Output Hardware Configuration (Paralleling)	Neutral tied internally to chassis (No paralleling)
	Neutral Floating (Standard paralleling)
DC1 Output	12 V, 15 V, 24 V, 28 V, 40 V, 50 V
DC Input / DC2 Output	28 V Input; 24 V Output; 28 V Output; 50 V Output
AC Input Frequency	47 - 65 Hz; 47 - 800 Hz

UPS	Output Power	Battery Pack Size	Height	AC Input Frequency	AC Output Voltage	AC Output Neutral Wire	AC Output Set Point Frequency	DC Input / DC2 Output	DC1 Output	Additional Options
UPS	1500	S	2S	L	1	G	6	D	28	E00
UPS	1500: 1500 VA 1250 W	S: Standard	2S: 3.4"†	L: 47-65 Hz W: 47-800 Hz	1: 115 Vrms 2: 230 Vrms	G: Grounded F: Floating*	5: 50 Hz 6: 60 Hz 4: 400 Hz	S: Not Installed D: DC Input M: DC2 Out 24 VDC with Droop Share P: DC2 Out 24 VDC No Sharing R: DC2 Out 28 VDC with Droop Share V: DC2 Out 28 VDC No Sharing W: DC2 Out 50 VDC No Sharing	00: None 12: 12 V 15: 15 V 24: 24 V 28: 28 V 40: 40 V 50: 50 V	000: None 0CE: CE Marking E00: Ethernet / SNMP ECE: Ethernet / SNMP & CE Marking

Not all combinations make valid part numbers, please contact SynQor for availability. See the Product Summary web page for more options.

* Note: Order "F: Floating" option when configuring the AC output for multi-unit combinations.

† Note: 2S denotes the 2U high shallow rack mount configuration

Examples: UPS-1500-S-2S-L2G5S00-0CE (230 V output with CE marking)

Contact SynQor for further information and to order:

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PATENTS

SynQor holds numerous U.S. patents, one or more of which apply to most of its power conversion products. Any that apply to the product(s) listed in this document are identified by markings on the product(s) or on internal components of the product(s) in accordance with U.S. patent laws. SynQor's patents include the following:

5,999,417	6,222,742	6,545,890	6,594,159	6,894,468	6,896,526
6,927,987	7,050,309	7,072,190	7,085,146	7,119,524	7,269,034
7,272,021	7,272,023	7,558,083	7,564,702	7,765,687	7,787,261
8,023,290	8,149,597	8,493,751	8,644,027	9,143,042	

WARRANTY

SynQor offers a 1 year limited warranty. Complete warranty information is listed on our website or is available upon request from SynQor.