EBM
Expansion Battery Module
EBM-1000-2U

Millitary Grade Uninterruptible Power Supply

3000 W EBM Output Power	85-264 Vrms 47-63 Hz / 360-800 Hz Charger Input	>45 Min. 1250 W >20 Min. 2500 W Battery Run Time	500 W Integral Charger	1250 W-hr Energy Storage	28 Vdc DC Input

Sealed Construction, Ultra low Weight, Compact Size



DESIGNED AND MANUFACTURED IN THE USA

SynQor's Military-Grade Expansion Battery (EBM) units are designed for the extreme environmental and demanding electrical conditions of Military Land, Shipboard, & Aerospace applications. SynQor's EBM incorporates field proven high efficiency designs and rugged packaging technologies. This EBM will accept a wide range of input voltage and frequency values while delivering a DC power source to the UPS. 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.

Combine Up to 3 units for Extended Battery Run Times

Features

- Sealed, weather-proof, shock-proof construction
- > 45 minute run-time at full power 1250 W UPS
- > 20 minute run-time at full power 2500 W UPS
- Integral 500W battery charger
- Full power operation: -20 °C to +55 °C
- Universal AC input: 85-264 Vac; 47-63 Hz/ 360-800 Hz
- Power factor correction at AC input
- Dual input (AC and DC)
- Cold start with no AC or DC input connections
- Up to 3 units can be combined for extended run time
- User I/O, Ethernet and Configuration signal ports
- 2U high rack mount unit 3.40"H x 17.00"W x 22.28"D
- Low weight: 61 lbs.

In-Line Manufacturing Process

- AS9100 and ISO 9001 certified facility
- Full component traceability

Specification Compliance

EBM units are designed to meet: *(pending)*

- 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 Specifications

INPUT CHARACTERISTICS		
AC Input - Charging		
Voltage	85-264 Vrms	
Frequency	47-63 Hz / 360-800 Hz	
Input Power Factor	0.99 typical at 47-63 Hz	
	0.97 typical at 400 Hz	
Maximum Input Current	8 A Continuous	
	25 A, Inrush, 10 ms	
	10 A Internal circuit breaker rating	
DC Input - Charging and Pass Through		
Voltage	22-33 V	
Maximum Input Current with UPS-1500	27.3 A	Charging only, see note*
	89 A	Pass through plus charging, continuous
	103 A	Pass through plus charging, transient
Maximum Input Current with UPS-3000	27.3 A	Charging only, see note*
	125 A	Pass through plus charging, continuous
	150 A	Pass through plus charging, transient

* The maximum input charging current may be reduced by user commands via EBM communication interfaces. DC output must be turned on for DC input charging.

OUTPUT CHARACTERISTICS		
DC Input Pass Through		
Maximum Output Power	3000 W	continuous
Battery Discharge		
UPS Output Power and Run Time	2500 W	>20 min.
	1250 W	>45 min.

LITHIUM-POLYMER BATTERY CHARACTERISTICS		
Total Battery Energy Storage	**1250 Whrs**	
Recharge Time	4 hrs	From 0% to 90% charge
Temperature Range for Recharge:	**0 °C to 45 °C**	

Internal heaters maintain battery temperature above 0°C when AC or DC input power is present. Battery charging only enabled below +45 °C.

ENVIRONMENTAL CHARACTERISTICS MIL-STD-810G	
Temperature Methods 501.5, 502.5	
Operating Temperature	-20 °C to +55 °C
Non-operating Temperature	-20 °C to +65 °C
Altitude Method 500.5	
Operating	0 - 18,000 ft
Non-operating Temperature	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 Vibrations of Shipboard Equipment	Method 528,Procedure 1

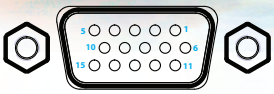
RELIABILITY CHARACTERISTICS MIL-HDBK-217F		
MTBF	TBD Hrs	MIL-217F Ground Benign, Ta=25 °C

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

MECHANICAL CHARACTERISTICS	
Chassis	
Chassis Size	3.40"(2U)H x 17.00"W x 22.28"D
Case Material	Aluminum
Total Weight	61 lbs.
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	CA02COME24-10PB
DC Output Connector	CA02COME24-10SB
Cooling Exhaust Fans	
Sound Pressure Level (SPL)	54 dB(A)
Air Flow	0.67(m^3/min) 23.7 CFM

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

Technical Specifications



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**
$\overline{\text{LOW_BATT}}$	**6**	**Open collector output where "low" indicates battery charge level <10%**
$\overline{\text{ACIN_GOOD}}$	**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**
$\overline{\text{ON_BATT}}$	**9**	**Open collector output where "low" indicates that the EBM is running on battery power**
REMOTE_START	**12**	**Drive this line "high" with ≥ 5 mA to enable EBM outputs**
SHUTDOWN	**13**	**Drive this line "high" with ≥ 5 mA to disable EBM outputs**
$\overline{\text{OUT_OK}}$	**14**	**Open collector output where "low" indicates DC Output voltage is within range**
$\overline{\text{OVER_TEMP}}$	**15**	**Open collector output where "low" indicates that the EBM is at or above its maximum temperature**

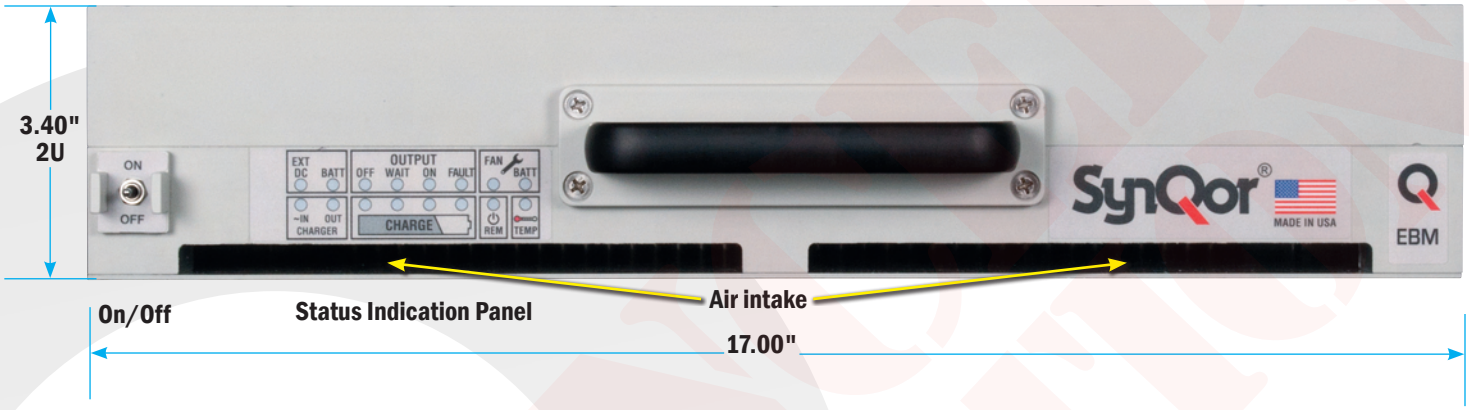
Safety & Qualifications	Pending
IEC 62133	Safety requirements for portable secondary sealed cells.
ST/SG/AC.10/11/Rev.6	UN Recommendations on the Transport of Dangerous Goods
UL 1642	Lithium Batteries
EN 62040-1:2009	General and safety requirements for UPS (Does not apply to 400Hz operation)
EN 62040-2:2006	UPS Electromagnetic compatibility (Category C4)

SynQor Expansion Battery Module Block Diagram

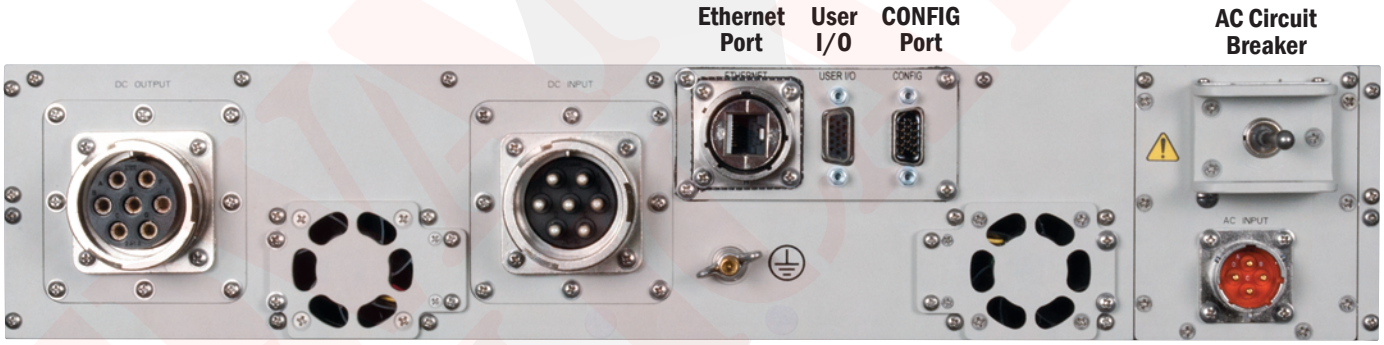


Technical Images

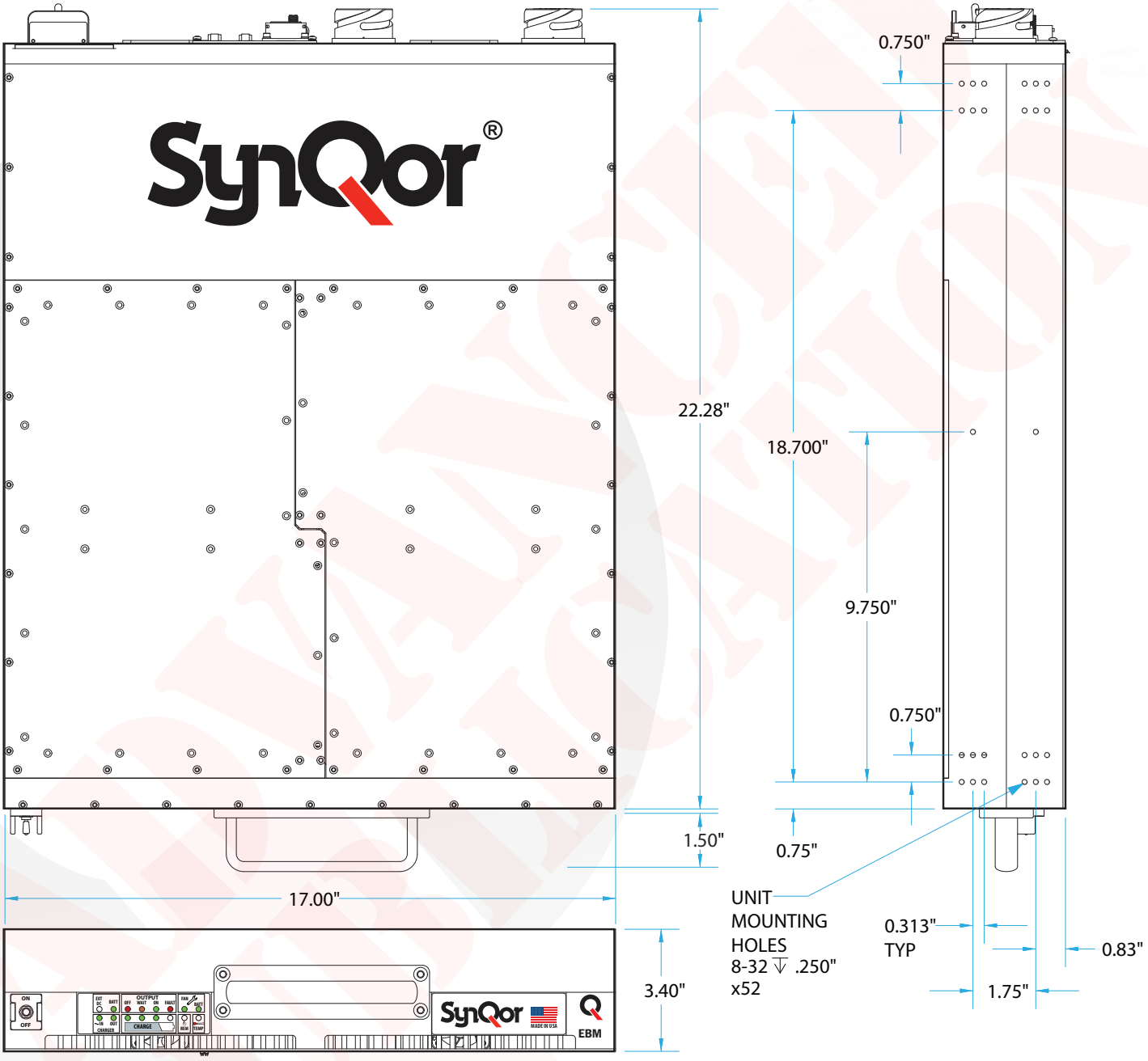
EBM-1000-2U



EBM-1000-2U-28-3000 Back Panel



Mechanical Diagrams



Accessory Options

Power Cable	
AC Input, NEMA 5-15 Plug, 10′ length	SYN-9104
AC Input, Hardwire, 10′ length	SYN-9102
DC Input, Hardwire, 10′ length	SYN-9155
EBM DC Output to UPS-3000 DC Input, 4′ length	SYN-9182
EBM DC Output to UPS-1500 DC Input, 4′ length	SYN-9183
Rail Kits	
Slide Rail Kit[2]	SYN-9002
Fixed Bracket Kit[3]	SYN-9033
Rackmount Transit Cases	
Transit Case, 3U, Gray, with Casters[3]	SYN-9410
Transit Case, 3U, Gray, No Casters[3]	SYN-9412

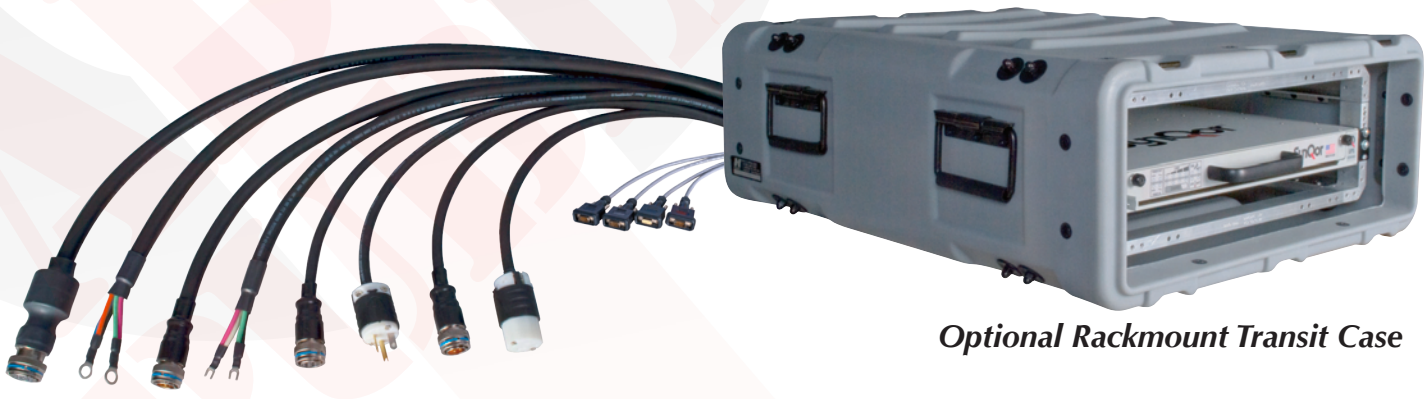
Notes:

1: Other Options also available, check the website or contact power@synqor.com for further information.

2: Slide Rail Kit (SYN-9002) is not recommended for transit and ruggedized use.

3: Fixed Bracket Kit (SYN-9031) with Transit Case (SYN-9410 or SYN-9412) is required for transit and ruggedized use (qualified to pass MIL-STD-810G Loose Cargo andTransit Drop requirements).

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



Optional Rackmount Transit Case

Ordering Information

PART NUMBERING SYSTEM

Model Number	UPS		Height	Weight	Options		
	Power	Battery Run-Time @ Full Power			DC Input (28 V nom)	DC Output	AC Input Frequency (47-63 Hz or 360-800 Hz)
EBM-1000-2U	1250 W	>45 min.	2U	61 lbs.	•	28V	•
	2500 W	>20 min.					

Family	Watt Hours	Height	DC Output Voltage	Output Power	Charging Input	Additional Options
EBM	1000	2U	28	3000	W	E00
EBM	**1000:** 1000W Hr	**2U:** 3.40"	**28:** 28 Vdc	**3000:** 3000 W	**W:** 47-63 Hz / 360-800 Hz	**E00:** Ethernet / SNMP **ECE:** Ethernet / SNMP & CE Marking

Part Numbering Example: EBM-1000-2U-28-3000-W-E00
For valid part numbers, refer to the website or contact your local sales representative or distributor.

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 one (1) year limited warranty. Complete warranty information is listed on our website or is available upon request from SynQor.