# SynQor®

# MPC
# MPC-1500-1U

## Military-Grade Power Conditioner

| 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 |
|---|---|---|---|---|

## *Sealed Construction, Ultra low Weight, Compact Size*




Designed & Manufactured in USA

SynQor's Military Power Conditioner units are designed for the extreme environmental and demanding electrical conditions of Military/Aerospace applications. SynQor's MPC incorporates field proven high efficiency designs and rugged packaging technologies. This MPC will accept a wide range of input voltage and frequency values while delivering a well-conditioned AC output to the load. 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

- Sealed, weather-proof, shock-proof construction
- 1250 W (1500 VA) output power
- Full power operation: -40°C to +55°C
- Universal AC input: 80-265 VAC; 47-65 Hz (see options)
- Power factor correction at AC input
- Dual input (AC and optional DC)
- True on-line double conversion
- 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
- 1U high rack mount unit (17.00"W x 21.60"D x 1.73"H)
- Low weight: 24 lbs.

#### 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

MPC-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

#### In-Line Manufacturing Process

- AS9100 and ISO 9001 certified facility
- Full component traceability

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SynQor®

Technical Specification

# MPC

# MPC-1500-1U

## INPUT CHARACTERISTICS

| | |
|---|---|
| **Operating AC Input** | |
| Voltage | 80-265 Vrms* |
| Frequency | 47-65 Hz<br>(47-800 Hz Optional) |
| Input Power Factor | >0.98 at 47-65 Hz<br>>0.97 at 400 Hz<br>>0.93 at 800 |
| Maximum Input Current Continuous | 20 A (full load, 85 Vrms) |
| AC Input Circuit Breaker Rating | 25 A |
| (* Power Derating to 80% below 90 Vrms) | |
| **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%<br>230 Vrms ± 3% |
| Frequency | 60 Hz ± 0.5%<br>50 Hz ± 0.5%<br>400 Hz ± 0.5% |
| Peak Load Current | 26 A (115 Vrms)<br>13 A (230 Vrms) |
| Load Power Factor | 0-1.0 (leading or lagging) |
| Total Harmonic Distortion | 2% (1000W resistive load) |
| **DC1 Output (optional)** | |
| Voltage Regulation (Over Load & Temperature) | ± 3% |
| Common Voltage/Power combinations (DC1) | 12 V at 42 A =504 W |
| (Other Options Available) | 15 V at 34 A =510 W<br>24 V at 21 A =504 W<br>28 V at 18 A =504 W<br>40 V at 12.5 =500 W<br>50 V at 10 A =500 W |
| **DC2 Output (optional)** | |
| Voltage Setpoint | ± 3% |
| **No Sharing** | |
| Voltage Regulation (Over Load & Temperature) | -2% |
| Common Voltage/Power combinations (DC2) | 50 V at 20 A =1000 W<br>24 V at 50 A =1200 W<br>28 V at 44.6 =1250 W |
| **Droop Share** (Output droops vs. load to allow passive sharing among modules.) | |
| **24 V Option** | |
| Voltage Regulation (Over Load & Temperature) | -15%<br>26 V at 0 A<br>22 V at 50 A =1100 W |
| **28 V Option** | |
| Voltage Regulation (Over Load & Temperature) | -13%<br>30 V at 0 A<br>26 V at 48.1 =1250 W |

## ENVIRONMENTAL CHARACTERISTICS MIL-STD-810G

| | |
|---|---|
| **Temperature Methods 501.5, 502.5** | |
| Operating Temperature | -40 °C to +55 °C |
| Non-operating Temperature | -40 °C to +65 °C |
| **Temperature Methods 503.5** | |
| Storage Temperature | -40°C — +70°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 |
| Humidity | Method 507.5 Procedure 2 |
| Mechanical Vibrations of Shipboard Equipment | Method 528 Procedure 1 |

## RELIABILITY CHARACTERISTICS MIL-HDBK-217F

| | | |
|---|---|---|
| MTBF | 100 kHrs | 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

| | |
|---|---|
| **1U Standard Chassis** | |
| Chassis Size | 17.00"W x 21.60"D x 1.73"(1U)H |
| Case Material | Aluminum |
| Total Weight | 24 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 | 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($m^3$/min) 23.7 CFM |

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



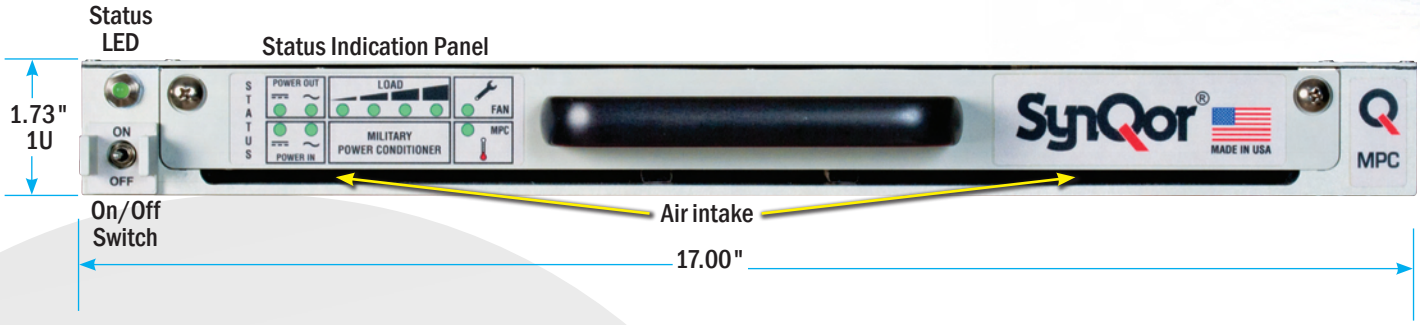

## High Density DB15 Female (15 Pin Connector)

| Signal | PIN Number | Function |
|---|---|---|
| TX | 2 | RS232 DCE Device Transmit |
| RX | 3 | RS232 DCE Device Receive |
| GND | 4, 5 | Ground reference for all digital inputs and outputs |
| $\overline{\text{ACIN_GOOD}}$ | 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 |
| REMOTE_START | 12 | Drive this line “high” with ≥5 mA to enable MPC outputs |
| SHUTDOWN | 13 | Drive this line “high” with ≥5 mA to disable MPC outputs |
| $\overline{\text{OUT_OK}}$ | 14 | Open collector output where “low” indicates AC Output voltage is within range |
| $\overline{\text{OVER_TEMP}}$ | 15 | Open collector output where “low” indicates that the MPC is at or above its maximum temperature |

## Safety & Qualifications

| | |
|---|---|
| EN 62040-1 | General and safety requirements for UPS<br>(Does not apply to 400Hz operation) |
| EN 62040-2 | UPS Electromagnetic compatibility<br>(Category C4) |

## MPC-1500-1U




## MPC-1500-1U with DC Input / DC1 Output Option

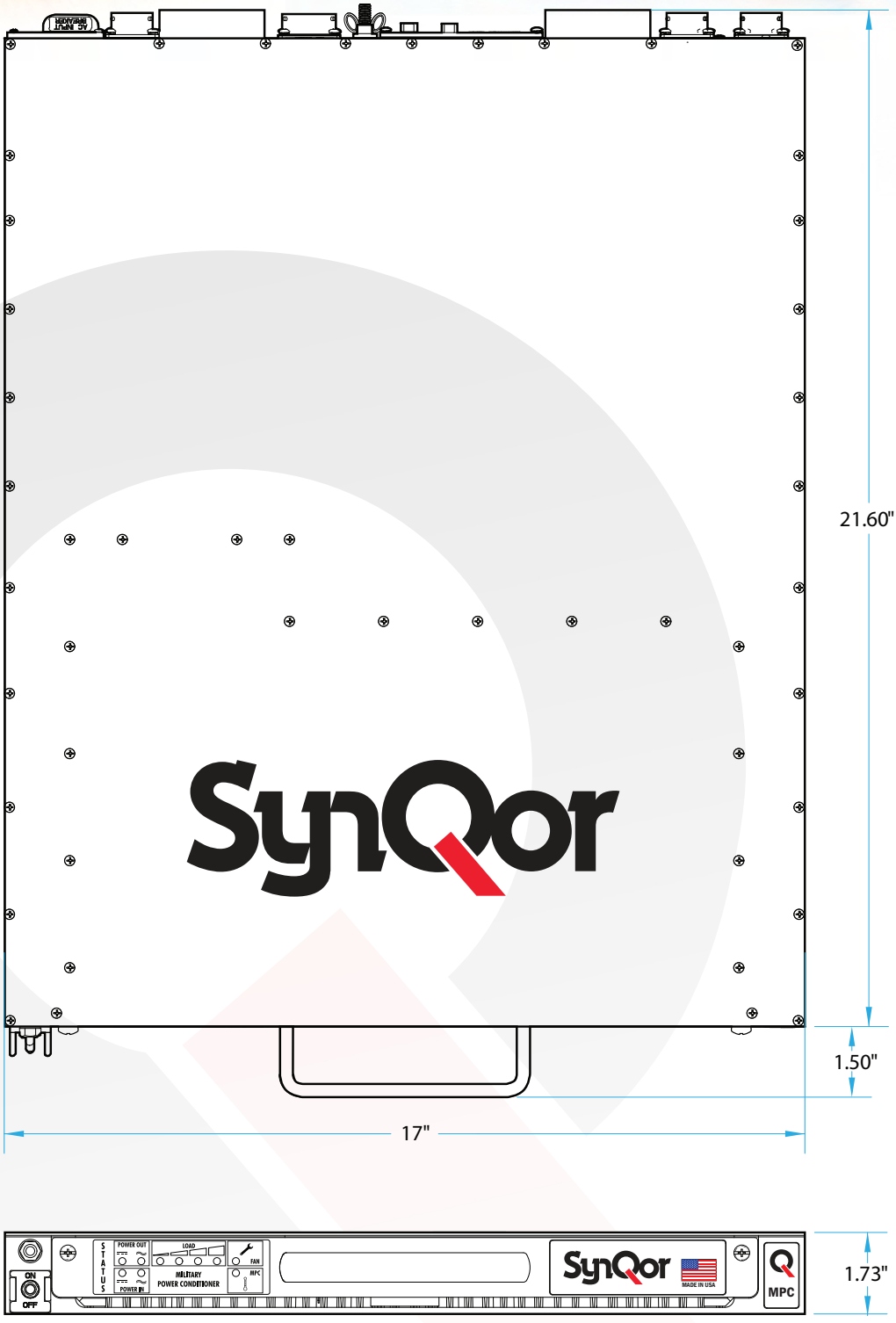


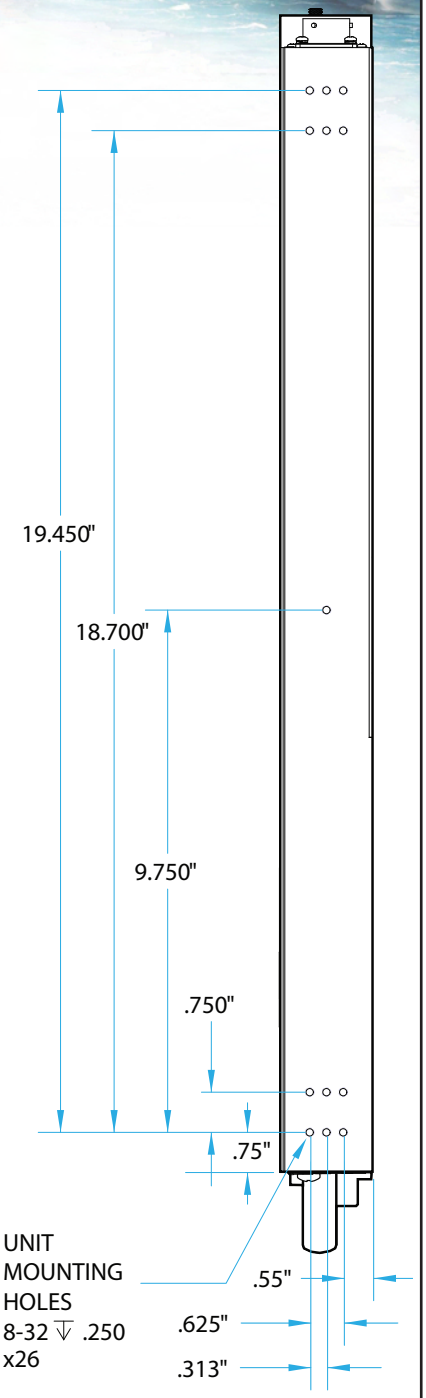

DC1 Output Optional | AC Output | Fan Exhaust | Ethernet Port | User I/O | CONFIG Port | Ground Stud (1/4-20) | DC Input Optional | Fan Exhaust | AC Input | AC Circuit Breaker

## MPC-1500-1U with DC1 Output / DC2 Output Options



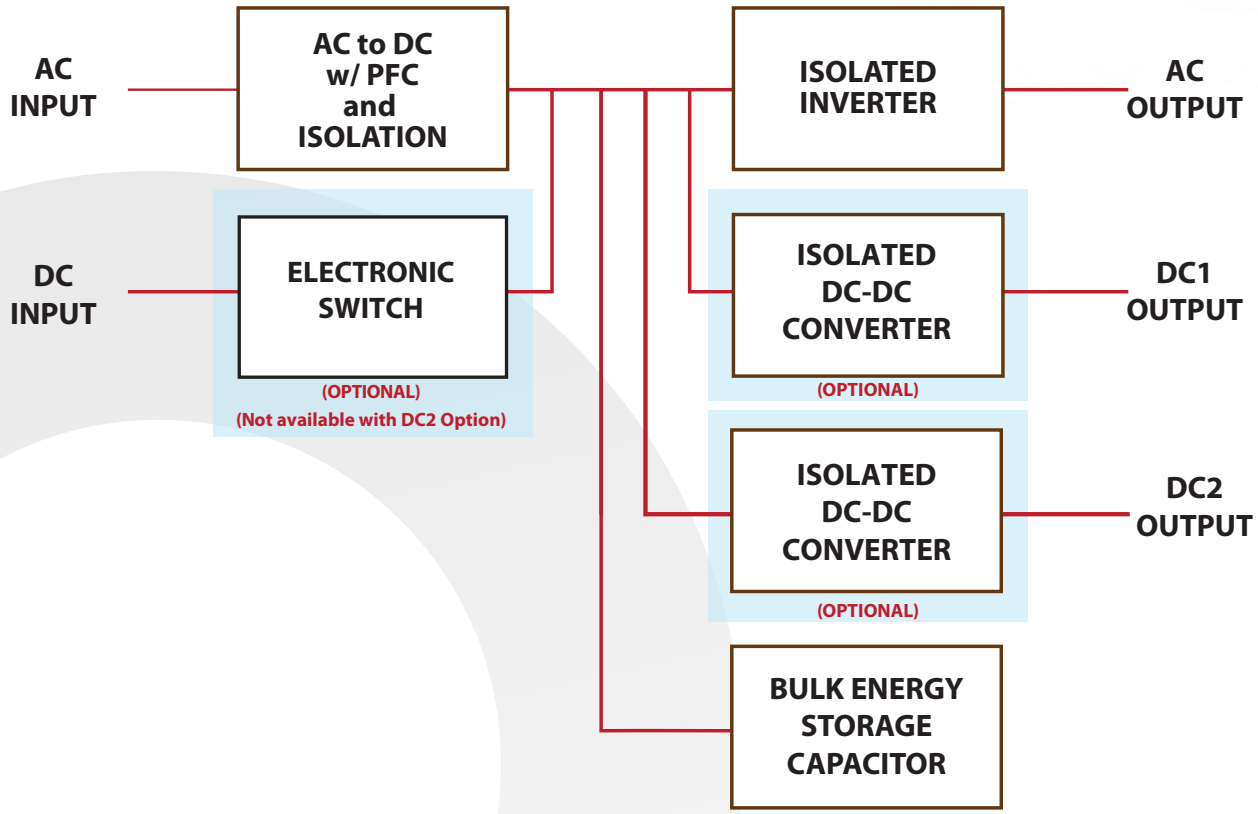

DC1 Output Optional | AC Output | Fan Exhaust | Ethernet Port | User I/O | CONFIG Port | Ground Stud (1/4-20) | DC2 Output Optional | Fan Exhaust | AC Input | AC Circuit Breaker


21.60"
1.50"
17"


19.450"
18.700"
9.750"
.750"
.75"
UNIT
MOUNTING
HOLES
8-32 ↧ .250
x26
.55"
.625"
.313"


ON
OFF
STATUS
POWER OUT
LOAD
FAN
MILITARY
POWER CONDITIONER
MPC
SynQor
MADE IN USA
MPC
1.73"

## BLOCK DIAGRAM



| | |
|---|---|
| **Rail Kits** | |
| Slide Rail Kit[2] | SYN-9002 |
| Fixed Bracket Kit[3] | SYN-9031 |
| **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 Output (115Vrms) (NEMA 5-20 Receptacle) | SYN-9131 |
| AC Output (Hardwire) | SYN-9130 |
| 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 |
| **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 |
| **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).



*Optional*
*Rackmount Transit Case*

| 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** | |
| 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 |







*6 NEMA Receptacles with Breaker*



# Ordering Information

**MPC**

**MPC-1500-1U**

## PART NUMBERING SYSTEM

| Model Number | Power | Height | Weight | Options | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | DC Input (28 V nom) | DC Output | Floating Neutral AC Output | AC Input Frequency (47-65 Hz or 47-800 Hz) | AC Output Voltage (115 Vrms or 230 Vrms) | AC Output Frequency (50 Hz, 60 Hz or 400 Hz) |
| MPC-1500-1U | 1250 W 1500 VA | 1U | 24 lbs. | • | 500 W DC1 1250 W DC2 | • | • | • | • |

| Family | Output Power | Height | AC Input Frequency | AC Output Voltage | AC Output Neutral Wire | AC Output Set Point Frequency | DC Input / DC2 Output | DC1 Output | Additional Options |
|---|---|---|---|---|---|---|---|---|---|
| MPC | 1500 | 1U | L | 1 | G | 6 | D | 28 | E00 |
| MPC | **1500:** 1500VA 1250W | **1U:**1.73" | **L:** 47-65Hz<br>**W:** 47-800Hz | **1:** 115Vrms<br>**2:** 230Vrms | **G:** Grounded<br>**F:** Floating * | **5:** 50Hz<br>**6:** 60Hz<br>**4:** 400Hz | **S:** Not Installed<br>**D:** DC Input<br>**M:** DC2 Out 24 VDC with<br>**P:** Droop Share DC2 Out 24 VDC<br>**R:** No Sharing DC2 Out 28 VDC with<br>**V:** Droop Share DC2 Out 28 VDC No Sharing<br>**W:** DC2 Out 50 VDC No Sharing | **00:** None<br>**12:** 12V<br>**15:** 15V<br>**24:** 24V<br>**28:** 28V<br>**40:** 40V<br>**50:** 50V | **000:** None<br>**0CE:** CE Marking<br>**E00:** Ethernet / SNMP<br>**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.

**Examples: MPC-1500-1U-L1G6D28-E00, MPC-1500-1U-L1F4S00-000**


**Contact SynQor for further information and to order:**

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USA


### 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.