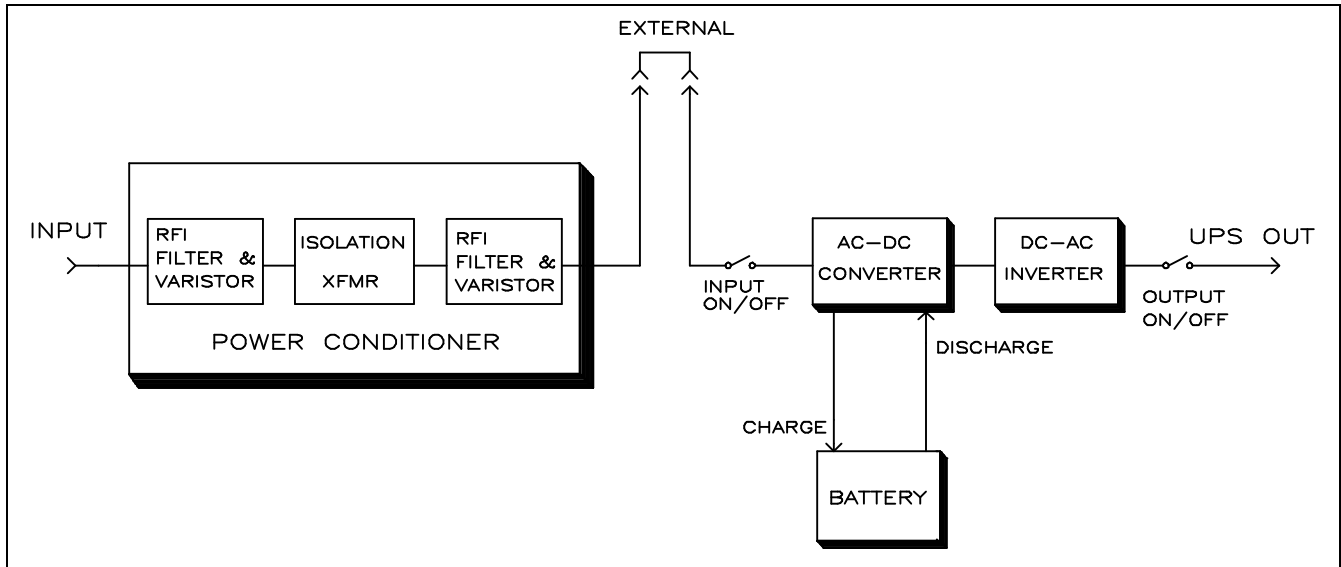


M-120BA-1A Ruggedized, high performance 2000VA UPS



UPS Block Diagram

MPST's M-120BA-1A is a ruggedized, high performance On-Line Uninterruptible Power supply (UPS) intended for military and tough industrial systems. The link between the input isolation transformer (including RFI filters and varistors) and the UPS input is external. Hence, when external bypass is desired, input-output isolation is maintained. The M-120BA-1A is designed for use in both ground and shipboard environments. Specifically, in addition to being physically ruggedized, the input stage of this UPS meets all the requirements of MIL-STD -1399 (section 300A). The main features of the M-120BA-1A are:

- Pure sine output digitally synthesized from a crystal oscillator.
- Pure sine input current with very low harmonic content.
- Better than 98% power factor.
- Very wide input range.
- Insensitivity to high line impedance.
- Very low input-to-chassis capacitance.
- Full galvanic isolation between input and output.
- 1000V / 50 μ s spike capability.
- MIL-STD-461D compatibility.
- Automatic, periodic battery self-test (using battery resistance method) without interrupting the output.
- MIL-STD-1399 (Section 300A) compatibility.

In order to assure the high reliability of the M-120BA-1A, MIL-STD-2000 is used as a guideline for workmanship. To enhance reliability and to withstand humid conditions all M-120BA-1A printed wiring boards are conformally coated per requirement 17 of MIL-STD-454.

The M-120BA-1A is packaged in a single 3U 19" rack (28" deep.)

The M-120BA-1A utilizes high frequency power MOSFET technology to assure high performance and cool operation.

A micro-controller embedded within the M-120BA-1A provides control, monitoring and host interface functions.

| | | |
|----------------|---|---|
| INPUT | <p><i>Voltage</i></p> <p><i>Frequency</i></p> <p><i>Power Factor</i></p> <p><i>Spikes</i></p> <p><i>Isolation</i></p> <p><i>Current waveform</i></p> <p><i>Line impedance</i></p> | <p>84-165VAC or 180-260VAC (selectable) without switching to battery power. (below this level the battery will be used).</p> <p>48-64 Hz</p> <p>> 98%</p> <p>200 joules clamping device</p> <p>Input, output and chassis are galvanically isolated (> 1 MΩ at 600VDC.) Total capacitance between input and chassis is less than 0.02uf per line. Leakage current is less than 2ma. (130dB Input Isolation Transformer.)</p> <p>Sinusoidal with harmonic content of less than 2.5% for harmonics between 2fo to 32fo and less than 100%/N for harmonics between N=32 and 20kHz. (I.A.W. MIL-STD-1399 section 300A.)</p> <p>Up to 5 ohms between 100Hz and 200kHz (I.A.W. MIL-STD-1399 section 300A.)</p> |
| OUTPUT | <p><i>Voltage</i></p> <p><i>Rating</i></p> <p><i>Frequency</i></p> <p><i>Waveform</i></p> | <p>115Vac ± 3%</p> <p>2000VA, 1500W</p> <p>60Hz ± 0.2% (digitally synthesized from a crystal oscillator)</p> <p>Sinusoidal , THD < 2% (linear load), < 4% (non-linear)</p> |
| BATTERY | <p><i>Type</i></p> <p><i>Capacity</i></p> <p><i>Charger</i></p> <p><i>Protection</i></p> <p><i>Monitor</i></p> | <p>Internal, encapsulated, sealed, maintenance-free, lead-acid.</p> <p>Full rated power for at least 15 minutes.</p> <p>Low ripple, regulated voltage float-charger, with current limiting and temperature compensation. Fully charges the battery within 5 hours.</p> <p>Battery is protected from over-discharge by internal protection circuit (to avoid damage to battery in case of prolonged power outage.)</p> <p>Battery charge level and internal impedance are monitored by the UPS micro-controller.</p> |
| EMC | <p><i>Federal</i></p> <p><i>Military</i></p> <p><i>ESD</i></p> | <p>Meets the requirements of:</p> <p>FCC Title 47 , part 15, class A.</p> <p>MIL-STD-461D, RE101, RE102, CE101, CE102, CS101 and RS103.</p> <p>All I/O lines are protected from ESD.</p> |

| | | |
|-----------------------------------|--|--|
| ENVIRONMENT | <p><i>Temperature</i></p> <p><i>Humidity</i></p> <p><i>Altitude</i></p> <p><i>Orientation</i></p> <p><i>Mechanical shock</i></p> <p><i>Vibration</i></p> | <p>Non operating: -40 to +72°C Note: High temperature for prolonged duration will shorten the battery life. Operating: 0 to +52°C.</p> <p>Up to 95%.</p> <p>Operating: Up to 10,000 feet. Non-operating: (Air transport) 40,000 feet.</p> <p>May be installed at any orientation.</p> <p>When packed, withstands the free fall drop and edgewise drop IAW Methods 5007.1 and 5008.1 of Federal Test Method standard 101C. When operating, withstands the high-impact shipboard shock IAW MIL-S-901D, grade A, class II., Type B.</p> <p>When operating, withstands Type I vibration IAW MIL-STD-167-1. The UPS will endure a sweep of 1.5g sinusoidal vibration from 5 to 50 Hz for a total duration of 2 hours, and random vibration IAW MIL-STD-810D, Cat. 9, Proc. I (test condition I-3.2.11, Fig. 514.3-34).</p> |
| INDICATIONS & CONTROLS | <p><i>a) Visual Indications (Front panel)</i></p> <p><i>b) Test Mode</i></p> <p><i>c) Audible Alarm</i></p> <p><i>d) Power Switches</i></p> | <p>10-segment tri-color Bar Graph for load level display. 10-segment Bar Graph for battery charge level display. "Output OK", "Output Fail" and "Standby" status lamps. "Input OK" and "Input Fail" status lamps. "On Batt " status lamp. "Batt Passed" and "Batt Failed" lamps for battery self-test. "Low Batt" warning lamp. "Overload Shutdown" status lamp. "Overtemp warning" and "Overtemp Shutdown" lamps.</p> <p>When test mode is invoked by pressing the push-button on the front panel, the UPS performs battery impedance testing without interrupting the output power (even if the battery fails) utilizing a proprietary time-sharing circuit. The test results are displayed on panel indicators. End-to-End testing of the UPS is accomplished by cycling the INPUT ON/OFF switch on the front panel.</p> <p>The UPS will beep when it operates on battery power or during over-temperature condition. The alarm may be silenced by pressing the "Alarm Off" push-button on the front panel.</p> <p>Input "On/Off" double-pole contactor. Output "On/Off" double-pole contactor. (Both controlled by switches located on the front panel.)</p> <p>The output of the Isolation Transformer is always provided and is not effected by the state of the contactors.</p> |

| | | |
|-----------------------|---|---|
| INTERFACE | <p>Discrete interface</p> <p>Serial Interface</p> | <p>Four dry contacts via 9 pin D-type connector indicating the following conditions: "UPS ON" (Output OK) "Battery Voltage Low" "Input Power Loss" (Battery Operation) "Fault Detect"</p> <p>A "Shutdown" input (via opto-isolator) for remote shutdown of the UPS.</p> <p>Two pinout configurations are available: Standard (Option -0) and Alternate (Option -1, see "SOFTWARE" below)</p> <p>RS-232 Serial port (EIA-RS-232) via 9 pin D-type connector. The serial port allows transmission of status and reception of User-Programmable Options, some of which are described below:</p> <p><u>Status:</u> Input OK, Output OK, On Battery, Low Battery, Over-Temperature Warning, Battery Test Passed/Failed, Load Level, Charge Level, status of all User Programmable Options and failure diagnostic.</p> <p><u>Commands:</u> UPS Shutdown, UPS Standby, Initiate Battery Test, Enable/Disable Periodic Battery Test, Enable/Disable Battle Mode, Enable/Disable Aural Alarm, Set Input power Limit (see note 1), Protection Reset (resets all latching protection circuits), System Reset (forces all User Programmable Options into their default state and resets all latching protection circuits).</p> <p>For the complete set of the available Status messages and Commands, refer to the User's Manual.</p> <p>Notes: 1. This option allows the user to feed the UPS from a limited power outlet. When in this mode, momentary peak power will be supported by the internal battery.</p> |
| SCREENING | | Environmental stress screening (including: thermal cycles, vibration and power burn-in) is available upon request. |
| ACOUSTIC NOISE | | Less than 48dBA. |
| SOFTWARE | | 3.5" and 5.25" diskettes of UPS interface software for Novell, OS/2 or HP/UX are available (for Option -1 only) |

HOW TO ORDER:

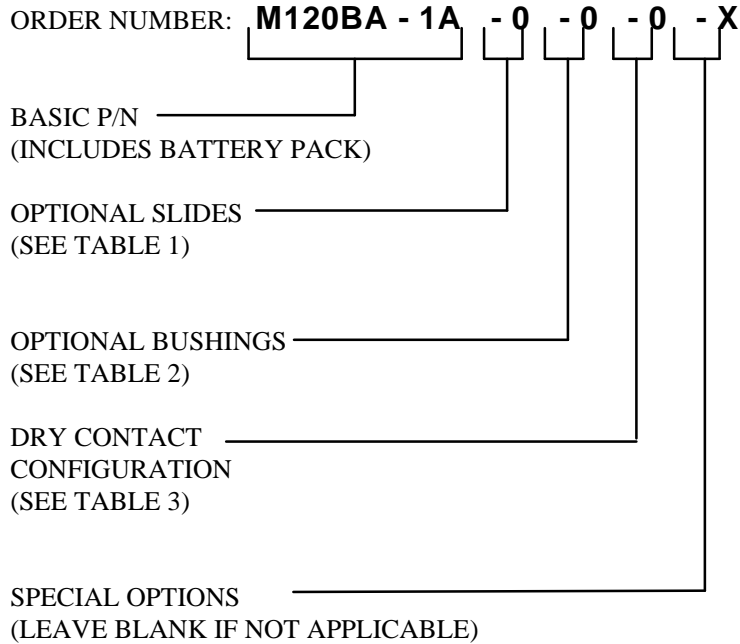


Table 1
Slides Configuration

| OPTION | DESCRIPTION |
|--------|--|
| -0 | None |
| -1 | With Chassis/Cabinet Slide Set P/N M350172. |

Table 2
Bushings Configuration

| OPTION | DESCRIPTION |
|--------|--|
| -0 | None |
| -1 | With Chassis/Cabinet Bushings and Pins Set P/N M350173. |

Table 3
Dry Contacts Configuration

| OPTION | DESCRIPTION |
|--------|---|
| -0 | Standard Configuration |
| -1 | Compatible with "PowerMon"® Software for Novell, OS/2 or HP-UX. |

Table 4
Special Options

| OPTION | DESCRIPTION |
|--------|---|
| -A | PowerMon Software for Novell with 6 ft cable. |
| -B | PowerMon Software for OS/2 with 6 ft cable |
| -C | PowerMon Software for HP-UX with 6 ft cable. |

REPLACEMENT BATTERY PACK ORDER NUMBER: **M350380**

PowerMon® is a registered trademark of Systems Enhancement Corporation