

M359-3 SERIES

UNINTERRUPTIBLE
POWER SUPPLY



PRODUCT HIGHLIGHTS

- FULL COMPLIANCE WITH MIL-STD-1399 (SECTION 300B)
- 3U RACKMOUNT
- 2.0KW/2.5KVA UPS
- 10-MINUTES HOLDUP TIME @ 1.5KW



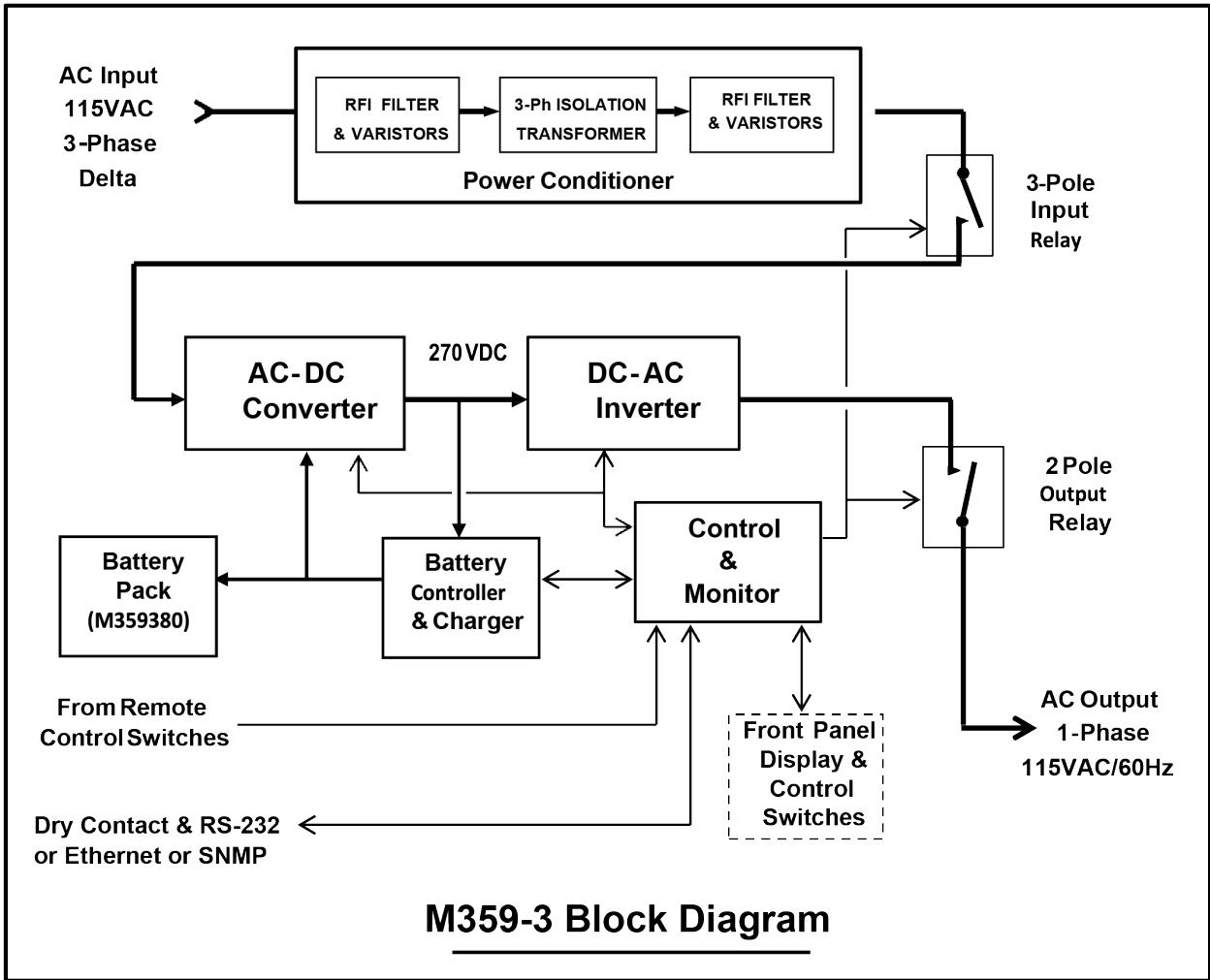
M359-3

2.0KW/2.5KVA, 3-Phase-In, 1- Phase Out UPS for Shipboard Application

Rugged, 19" Rackmount, high performance On-Line UPS, designed for Naval Shipboard and tough industrial applications. It accepts 115VAC/60Hz, 3-Phase (Delta) Shipboard Power and provides an uninterruptable and isolated 115VAC/60Hz Single- phase output.

M359-3 Main Features:

- 19" Rack-mount, 3U high and 22" deep.
- A front panel loaded, Plug-in Battery Pack.
- Internal 3-phase, 60Hz Input Isolation Transformer.
- Full Compliance with MIL-STD-1399, Section 300B, Type I Power (115VAC/60Hz).
- Very low Input Current Harmonic content (MIL-STD-1399 compliant).
- Better than 98% Input Power Factor.
- Full galvanic isolation between Input, Chassis GND and Output.
- 115VAC/60Hz, low-distortion sine-wave output, synthesized from a crystal oscillator.
- Over-load, Over-voltage and Over-temperature Protection.
- Immune to MIL-STD-1399, Section 300B 1,000V spikes.
- Complies with MIL-STD-461F.
- Complies with MIL-S-901D (Grade A, Class I &2) and MIL-STD-167-1 (Type I).
- Remote Panel ON/OFF capability.
- Standard Mil-type (metal-shell) circular power connectors.
- RS-232 or Ethernet SNMP v1, v2 or v3 Control and Monitor.
- J-STD-001B and IPC-610A Class-3 Workmanship.
- MIL-I-46058C and IPC-CC-830 Polyurethane conformal coating on PWBs.



Specification

INPUT	Type	115VAC/60Hz, 3-Phase Delta, Type I per MIL-STD-1399, Section 300B.
	Voltage Range	0 - 155VAC (L-L), in accordance with MIL-STD-1399, Section 300B.
	Switchover Voltage	Below 103VAC(L-L) the M359 may switch to Battery power. (92VAC @1,800W)
	Frequency	48-64 Hz
	Power Factor & Efficiency	P.F: > 0.98 @ full-load. Efficiency (full-load) is higher than 84%
	Spikes	Withstands the 1,000V Spikes specified by MIL-STD-1399, Section 300B.
	Isolation	Compatible with Ungrounded Shipboard Power. AC Input is isolated from AC Output and chassis (> 10 M Ohm at 600VDC). Less than 0.02 μ F from each AC Input line to Chassis. Less than 2mA leakage to chassis.
	Current Harmonic Distortion	Less than 2.5% from 2 nd to 32 nd harmonics and less than 100%/N for harmonics between 32 nd and 20kHz (I.A.W. MIL-STD-1399, Section 300B).
	Inrush Current	Limited Per MIL-STD-1399, Section 300B, (less than 50A RMS).
	Input Current	Less than 16Amp (per phase) when loaded by 1,800W. Internally Limited to 20 Amp per Phase during over-load condition
Power Interrupts	No damage and no Output interrupt for all conditions of MIL-STD-1399 (300B)	
OUTPUT	Voltage	Single-phase, 115 \pm 3VAC, Grounded Neutral (Note 1).
	Frequency	60Hz \pm 0.2% (digitally synthesized from a crystal oscillator)
	Power Rating	2.0KW/2.5KVA up to +45°C. 1.8KW/2.25KVA up to +55°C (Note 2).
	Waveform	Sinusoidal, THD of 2% (linear load), 6% (non-linear)
	Over-voltage Protection	Automatic shutdown if output voltage exceeds 125Vrms
	Overload Protection & Current Limit	Output protected from overload/short-circuit condition with automatic recovery upon overload removal. Output current is Internally limited to 40 Amp peak.
BATTERY	Type	A Front Panel Loaded, Hot-swap Plug-in, encapsulated Battery Pack (Model M359380).
	Holdup Time	10 minutes (minimum) into 1.5KW AC Load.
	Charger	Low ripple, regulated float-charger, with current limiting and temperature compensation. Fully charges the battery within 6 hours (following a full discharge at 1.5 kW).
	Protection	Protected from over-discharge and thermal runaway by internal protection circuit.
	Monitor	The batteries charge level, temperature and health are monitored by the UPS micro-controller.
EMC	MIL-STD-461F	CE101, CE102, CS101, CS106, CS114, CS116 RE101, RE102, RS101 and RS103.
	DC Magnetic Field	1600A/m (20 Oersteds) per DOD-STD-1399.

Notes

1. The Output Neutral Grounding Link is accessible to the user and can be removed in order to allow grounding at a user selected location, or in order to obtain a floating output (not recommended).
2. At ambient temperature above 45°C, the maximum steady-state output power should be linearly derated by 20W/25VA per each °C above 45°C, down to 1.8KW/2.25KVA at 55°C. For short term loading (less than 5 minutes) no derating is required.

ENVIRONMENT	Temperature	Non-operating: -40 to +72°C (Note 3) Operating: 0 to + 55°C (see Note 2 on previous page)
	Humidity	Up to 100% RH per MIL-STD-810G, Method 507.5 Proc II.
	Altitude	Non-operating: (Air transport) 40,000 feet.
	Orientation	May be installed at any orientation.
	Mechanical Shock	High-impact shipboard shock IAW MIL-S-901D, Grade A, Class I and II.
	Vibration	Type I Deck Mounted vibration IAW MIL-STD-167-1. Random vibration I.A.W. MIL-STD-810D, Cat. 9, Proc. I (test condition I-3.2.11, Fig. 514.3-34)
INDICATIONS & CONTROLS	Visual Indications (Front panel)	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 LEDs. "Input OK" and "Input Fail" status LEDs. "On Batt " status LED. "Batt Passed" and "Batt Failed" LEDs for battery self-test. "Low Batt" warning LED. "Overload Shutdown" status LED. "Overtemp warning" and "Overtemp Shutdown" LEDs.
	Test Mode	When Battery-operation Test is invoked, the UPS performs a UPS and battery-test without interrupting the output power (even if the battery fails).
	Audible Alarm	The UPS beeps when operating on battery power or during over-temperature condition. The alarm may be silenced by pressing the "Alarm Off" push-button on the front panel.
	Power Switches	The M359 has two power relays controlled by the Front-panel switches; a 3-pole relay on the input and a 2-pole relay on the output.
	Remote Control	Supports a remote On/Off control by a low-power (28Vdc/0.5A) remotely located control switch.

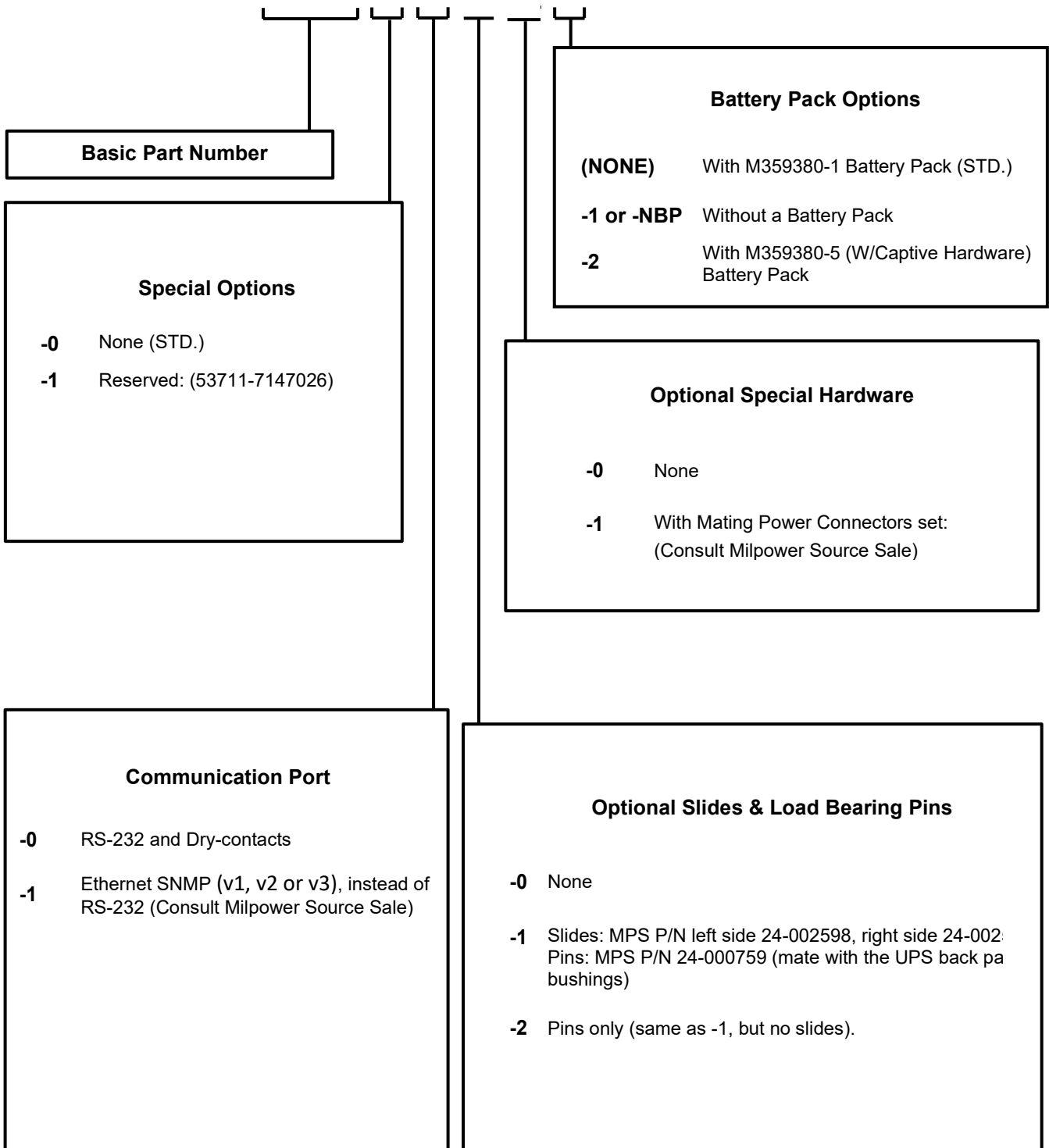
Notes

3. Storing the UPS with the Battery Pack at high temperature for prolonged duration will shorten the battery life.

INTERFACE	Discrete interface	<p>Four dry contacts indicating the following conditions: "UPS ON" (Output OK) "Battery Voltage Low" "Input Power Loss" (Battery Operation) "Fault Detect"</p> <p>A "Battery-saving Shutdown" input (via opto-isolator) allows the user to shut down the UPS during Battery-operation. When the AC input recovers the UPS will automatically turn ON.</p>
	Ethernet SNMP Port	<p>RJ-45, CAT-5 SNMP v1, v2 or v3 Port with Server/ Client Monitor Software. Allows monitoring of the UPS (using MIBs). Supports user defined event-triggered shutdown. Supports different shutdown timing for each Client in the net. Supports delayed (after Server shutdown) UPS shutdown.</p>
	Serial Interface	<p>Optional (instead of Ethernet) RS-232 Serial port provides Status messages, accepts User's commands and allows the setting of User-Programmable Options.</p> <p>RS-232 Status message: Input OK, Output OK, On Battery, Low Battery, Over-Temperature Warning, Battery Test Passed/Failed, Load Level, Battery Charge Level, status of all User Programmable Options and Failure diagnostic.</p> <p>RS-232 Commands: UPS Shutdown, UPS Standby, Initiate Battery Test, Enable/Disable Periodic Battery Test, Enable/Disable Battle Mode, Enable/Disable Audible Alarm, 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 "UPS_Soft_1" Software Interface Manual. (Available at http://www.milpower.com).</p>
MTBF		150,000 hours (at typical below-deck Naval environment)
SCREENING		Available upon request.
ACOUSTIC NOISE		Less than 54dBA (measured 3 ft from Front Panel, under normal operating conditions).
FUNGUS		Does not support fungus growth, in accordance with MIL-STD-810G, Method 508-6.
WEIGHT and SIZE		137 Pounds. (85 Pounds without the Battery Pack.) 19", 3-U, 22" deep, Rack mount or Hard mount.

How to Order

Order P/N: M359-3 -0 -1 -0 -0 -



Note: Specifications are subject to change without prior notice by the manufacturer