

AMETEK® — **INTELLIPOWER** **Uninterruptible Power Supply (UPS)** **Generic User Manual**



ISO 9001:2015 Certified Facility

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Generic User Manual

Uninterruptible Power Supply (UPS)

Certain products have model specific user manuals.

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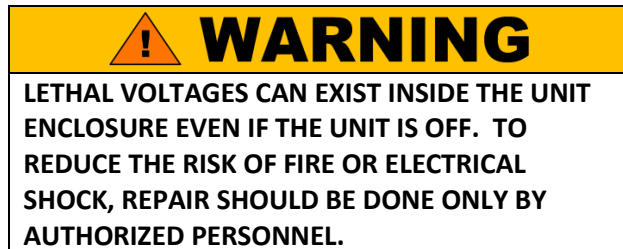
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<h1>Important Safeguards</h1>	<h1>2</h1>
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1. Read all information and instructions in this manual.
2. Unit may have considerable weight. Unit may cause injury if lifted improperly or dropped.
3. Do not operate unit if it has been damaged, including chassis, internal components, connectors, and power cords. In the event of damage, return unit to AMETEK-IntelliPower for service.
4. The use of attachments not recommended by AMETEK-IntelliPower or those not requested and approved in customer spec may cause injury.
5. To protect against electrical shock, do not place any part of the unit in water or other liquid.
6. Do not let power cords hang over edges, reside near hot surfaces, or be exposed to other conditions where power cord insulation could be damaged.
7. Do not insert any materials, objects or connectors other than proper mating connectors into unit connectors.
8. Unless specified, units are intended for use in an environment which is relatively free of conductive and non-conductive contaminants such as carbon or metal dust. Placement in high dust areas may cause damage.
9. Do not touch hot surfaces. Before removal, allow unit to cool.
10. Do not expose batteries to fire.
11. Do not disconnect or connect the wall socket or source power connector to turn the unit OFF or ON. Doing so causes arcing of the input connector and source power connector(s). Always turn OFF the unit before connecting to power source or disconnecting from power source.
12. Do not attempt to change individual batteries.
13. This publication may have been updated since this copy was released. Note the manual number. Contact support to request the latest version.



<h1 style="margin: 0;">Unpacking & Inspection</h1>	<h1 style="margin: 0;">3</h1>
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Please also reference the Support section and the Returns section.

- After unpacking the system, inspect it carefully. If you discover damage contact AMETEK-IntelliPower.
- If the merchandise was damaged do not attempt to use it. Failure to file a damage claim with the shipping carrier or failure to send a copy of the claim to AMETEK-IntelliPower within 15 days from receipt of the equipment may void the warranty.
- Retain the shipping carton and packing material.
- If returning or shipping the system, use the original AMETEK-IntelliPower packaging materials. If the original packaging is not available, contact AMETEK-IntelliPower for new packaging.
- Heavy models require pallet shipping.

Reference the label on the rear of each unit or applicable specification documents to fill in the table below.

Model Number	
Serial Number	
Purchase Date	
Dealer Name	

Storage & Maintenance

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I. Lead Acid and Lithium Iron Phosphate Batteries

1. Battery Maintenance During UPS Storage

Note: Lithium Iron Phosphate batteries should be charged at 40 to 60% during long term storage conditions greater than 3 months for longest life. Sealed Lead Acid batteries should be kept charged at 100% capacity under all conditions.

a. General Procedure to Place UPS into Storage

- Apply AC power by switching on the input circuit breaker and then switching off. The UPS will continue to operate in battery run mode.
- Alternately, the cold start switch can be pressed to place UPS into battery run mode.
- Operate the UPS until the batteries are fully discharged.
- For Lithium Iron Phosphate batteries, use the charging options as outlined in **section 1b**. Use 100% full charging for either removal from storage or short-term storage (less than 3 months). Use 40-60% partial charging for long-term storage (greater than 3 months).
- To avoid full battery discharge after 40-60% partial or 100% full charging, the UPS can be completely shut down. First remove input power. Then press F2 and F3 and hold for at least 1 second. This will initiate UPS shut down in battery mode. The front panel LED lights will sequentially energize and then shut-off in sequence, after which the UPS will completely shut off. If lights and fans do not complete shut-off press F2 and F3 a second time for at least one second.
- When placing / returning to storage, keep UPS unit in the original packing materials and shipping carton.
- Protect the stored UPS unit from moisture and weather.
- During storage, follow the tables below for battery charging intervals:

Tables of Recommended Battery Charging Intervals

Sealed Lead Acid	
Storage Temperature	Battery Charging Interval (Months)
Less than 20C	9
21 to 30C	6
31 to 40C	3
41 to 50C	1.5
51 to 60C	1

Lithium Iron Phosphate	
Storage Temperature	Charging Frequency (Months)
Less than 20C	18
21 to 30C	12
31 to 40C	8
41 to 50C	6
51 to 60C	5

b. Charging Procedure Options During and After Storage

Lead Acid: Removal from Storage; Short-Term and Long-Term Storage

Lithium Iron Phosphate: Removal from Storage; Short-Term Storage - Less than 3 months:

- Perform a battery runtime test described in section 2.
- Follow this with at least 12 hours of normal AC line powered operation to restore the battery charge level from a complete discharge to 100% charge. Preferably, have the UPS output at no load while recharging.
- After recharging, perform a complete shut-down of UPS as outlined in **section 1a**.
- Either return the UPS to storage or place unit into service.

Lithium Iron Phosphate Only: Long-Term Storage, Greater Than 3 months:

- For long term storage greater than 3 months, battery life will be maximized by keeping Lithium Iron Phosphate batteries at a 40-60% state-of-charge rather than at 100%.
- At the intervals specified in the table above, operate UPS at full load and remove AC power.
- Operate the UPS in battery run mode until shut-off occurs.
- Apply AC power and switch on the UPS. Allow charging to continue until the 3rd LED or 40-60% charge point is reached.
- Perform complete shut-down of UPS as outlined in section 1a.
- Return UPS to storage with batteries at 40-60% state-of-charge.

2. Battery Maintenance During UPS Service

It is highly recommended to perform a battery runtime test upon receipt of the unit and at least every 3 months thereafter. Use the battery maintenance worksheet at the end of this chapter.

Proper battery maintenance requires a battery runtime test, every three months. This test should be done upon receiving the unit. Results should be retained for comparison with the results of future tests.

- a. Allow the UPS to continue to run at least 6 additional hours after the battery capacity meter on the front panel has reached 100%. Upon battery capacity LED meter reaching 100%, the unit has transitioned from fast-charge mode to float charge mode. UPS is now top charging batteries the last few percent at a slower, safer rate.
- b. With AC power applied, apply the UPS output load specified by AMETEK-IntelliPower for battery runtime testing.
- c. Place the unit in battery runtime mode by removing input AC power. The front panel battery capacity meter will start flashing and the UPS will sound a beeping alarm. The beeping alarm may be silenced by pressing the F3 Silence button.
- d. With AC input power removed, simultaneously start a timer to measure the battery runtime.
- e. Once approximately 90% of battery capacity has been exhausted, the unit will sound a continuous tone alarm (The F3 Silence button is now over-ridden). Allow the UPS to continue to operate in battery run mode until complete battery exhaustion occurs. The UPS will shut down automatically when this point is reached.
- f. Record the unit serial number and the measured battery run time. Use the data as a battery runtime benchmark for future tests.
- g. Allow the unit to cool down, un-powered (off) for at least 2 hours - but not more than 12 hours - following a battery runtime test. This allows the batteries to return to ambient temperature before attempting a full recharge. Full battery recharge requires a minimum of 12 hours.

WARNING – Do NOT begin a battery recharge if ambient temperature is above 50C/122 F.

3. Battery Charging Display and Battery Fault Modes

Fast Charging Mode:

This occurs when the battery LED display indicates 80% or less state of charge (SOC).

Float/Final Charging Mode:

This occurs when the battery LED display first indicates 100%. After the battery capacity LED meter reaches 100%, an additional 6 hours is required to finish charging the batteries.

- a. Lead Acid batteries are continuously float charged after reaching 100% charge.
- b. Lithium Iron Phosphate batteries receive a limited time final charge to avoid damage from continuous float charging.

Shorted Cell Damage:

The most common and potentially damaging failure mode is for a single cell to partially short. When this happens, the series battery pack will never reach float charge level because of the missing voltage from the shorted cell. The UPS will thus remain in “Fast Charge” mode.

If battery charging continues with a shorted cell, the remaining cells in series may eventually be damaged from overcharging, resulting in swelling, outgassing or venting of the battery. To help prevent this, the UPS microprocessor monitors the battery charger operating mode. If the UPS remains in fast charge mode for more than 24 hours, the Service Battery LED will turn ON. However, depending on the severity of the cell short, the remaining batteries may still overcharge and be permanently damaged before the 12-hour period is complete. This is especially true if more than one cell shorts at about the same time.

Open Cell Damage:

A second mode of battery failure is for a cell to partially open rather than short. If this happens, the UPS microcontroller senses that the batteries are simply at the float charge level. Thus, the front-panel battery capacity meter indicates 100%, even though the batteries are not properly charged.

This 100% indication is misleading if there is an open cell because the entire series battery pack voltage will rise. This gives the charging hardware the impression that all cells are already near full charge. In turn, this causes the charger to prematurely transition from fast-charge mode to float-charge mode.

Under these conditions the battery runtime under load is severely reduced or crippled. Marginally reduced runtime may or may not be detectable unless a user periodically performs a battery runtime test. In cases of one or more completely open cells, the UPS will refuse to operate on batteries under load but will operate normally with AC power applied.

4. Recycling

- a. Batteries must always be recycled in accordance with local laws and regulations. For the local recycling facility in your area, consult the website: earth911.com or the battery vendor as shown on the battery.

5. Hot Swap Battery Tray Replacement

- a. It is not necessary to turn the UPS off while changing the Hot Swap Drawer. However, should you lose input power during this procedure the UPS will shut down and the protected equipment will experience a hard shut down.
- b. Replacing the drawer should not take more than 15 minutes.
- c. Identify and remove all stainless-steel screws used to secure the battery tray. The number of fastener screws, screw head type, and screw thread size will vary, depending on the battery tray configuration. Some tray configurations will also use captive fasteners rather than loose screws. Do not remove any screws used to hold the tray assembly together.
- d. The power connection is internal to the UPS and uses self-aligning dagger pins that do not require any tools or actions from the operator to disconnect the battery drawer.
- e. Using the handle, carefully pull the drawer out slightly and supporting the bottom of the drawer with the other hand, completely remove the drawer and set it aside (the drawer can heavier than it looks, especially if sealed lead acid batteries are used).
- f. Replace with the new drawer by sliding it into the chassis as far as it will go. The mating pins on the rear of the drawer will automatically connect, and at this time the UPS is fully operational.
- g. Replace fasteners screws and torque to the appropriate levels:
 - 4-40 Screws: 4 in-lbs.
 - 6-32 Screws: 9 in-lbs.
 - 8-32 Screws: 14 in-lbs.
 - 10-32 Screws: 18 in-lbs.
- h. The UPS display should show the battery capacity at 50% or 100%, depending on the battery state-of-charge.
- i. It is recommended to run a test of the batteries by turning off the main circuit breaker. This will cause the UPS to run on batteries for a few seconds just to make sure the unit is fully operational.

II. Fan Filter and Exhaust Grill Maintenance

1. Fan Filter and Exhaust Grill Maintenance

Fan filters and exhaust grills may become obstructed by dust and debris accumulation. Blocked fans can cause unit overheating and damage, due to compromised airflow rate. Periodically check the condition of each fan/grill filter. Clean fan/grill filters as required.

- a. Check the fan/grill intake and exhaust periodically to establish an appropriate cleaning frequency. Environments with high amounts of debris will require more frequent fan/grill filter cleanings.
- b. Before each cleaning, shut down the UPS completely (input breaker off, followed by F2/F3 shutdown) so that fan blades are not turning during this operation.
- c. Filter/grill cleaning:

Metal Honeycomb EMI or Plastic Type Filter Grills: Gently vacuum fan intake and exhaust to clear dust and debris.

Foam Type Filters: Remove plastic fan grills and wash the foam elements with soapy water.

Model Specific Features	5
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Refer to specific Product Data Sheet and Mounting and Outline Drawing (when available) for your unit.

General Enclosure Layouts 6

Figures A through F depict front and rear panel interface of general models. All dimensions are in inches.

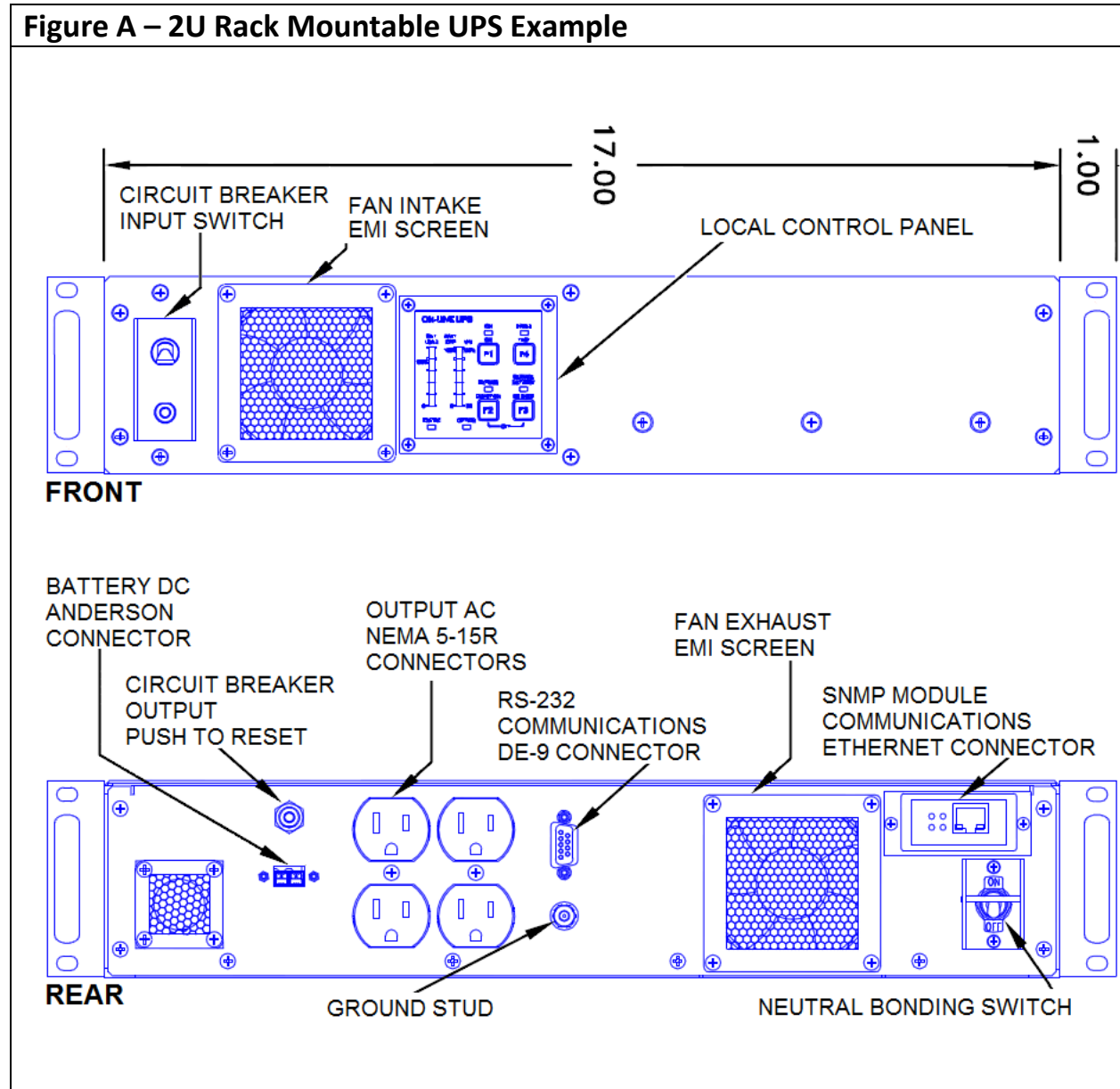


Figure B – 1U Rack Mountable UPS Example

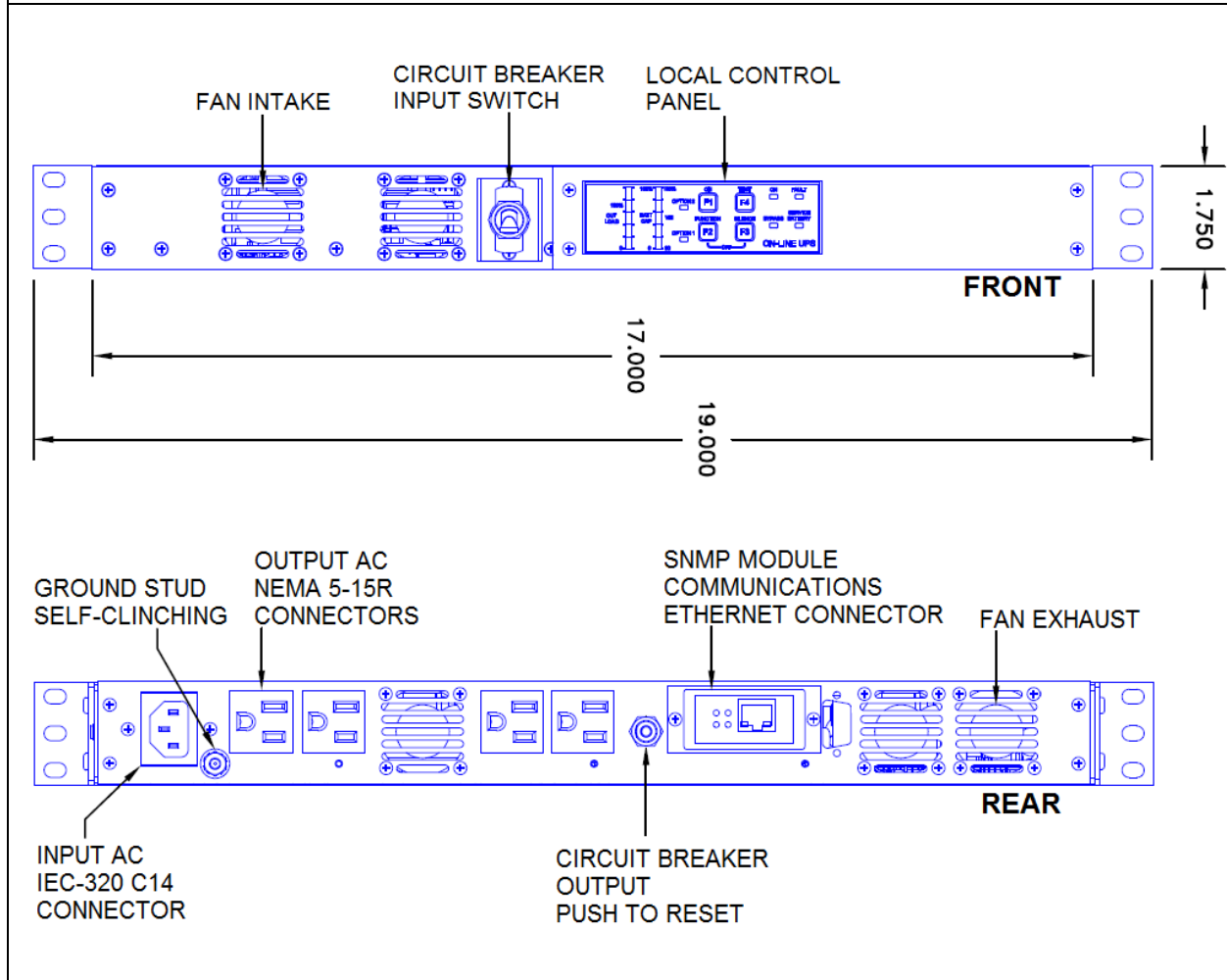


Figure C – Free Standing Tower UPS Example

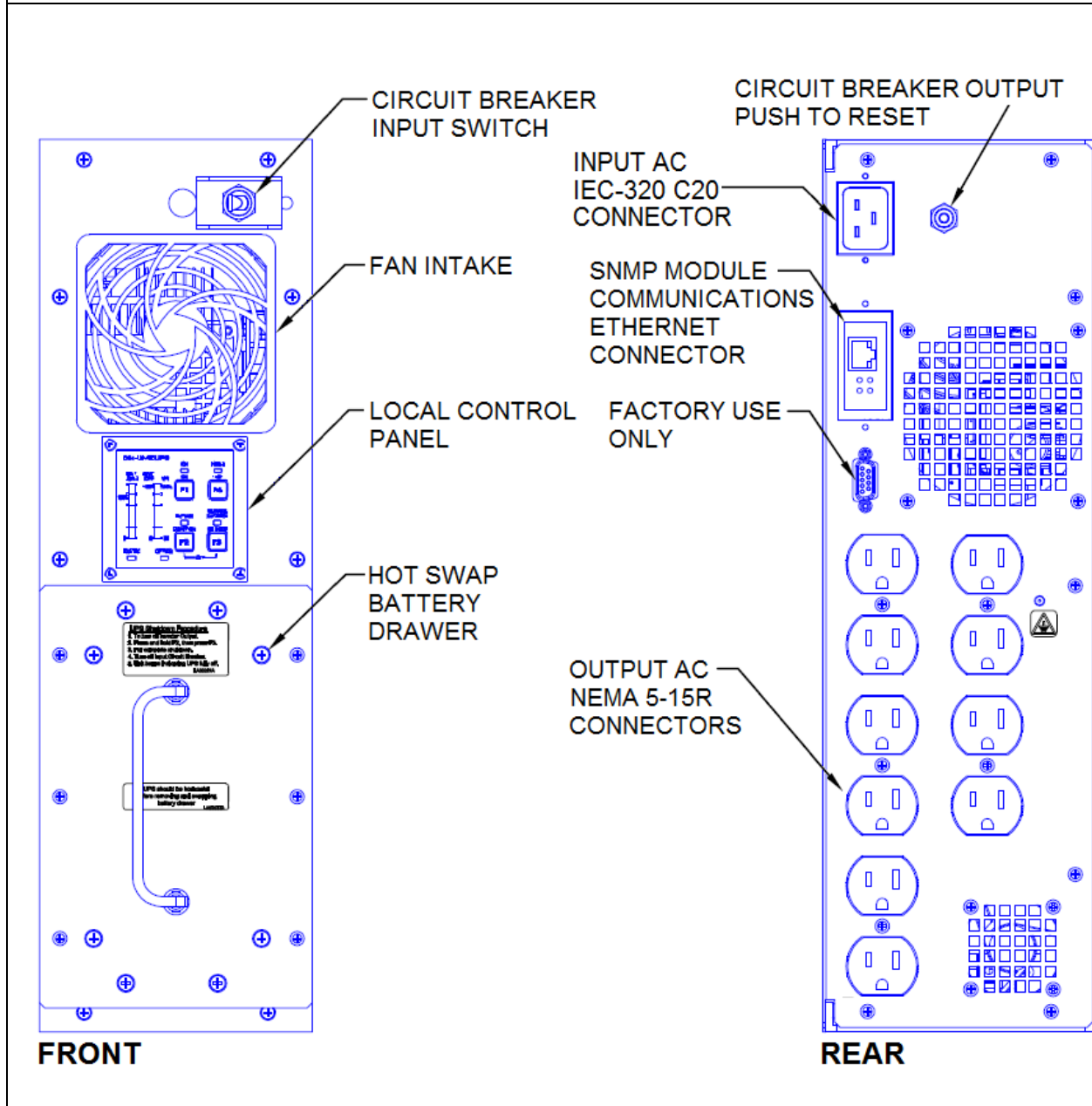


Figure D – PDU Example

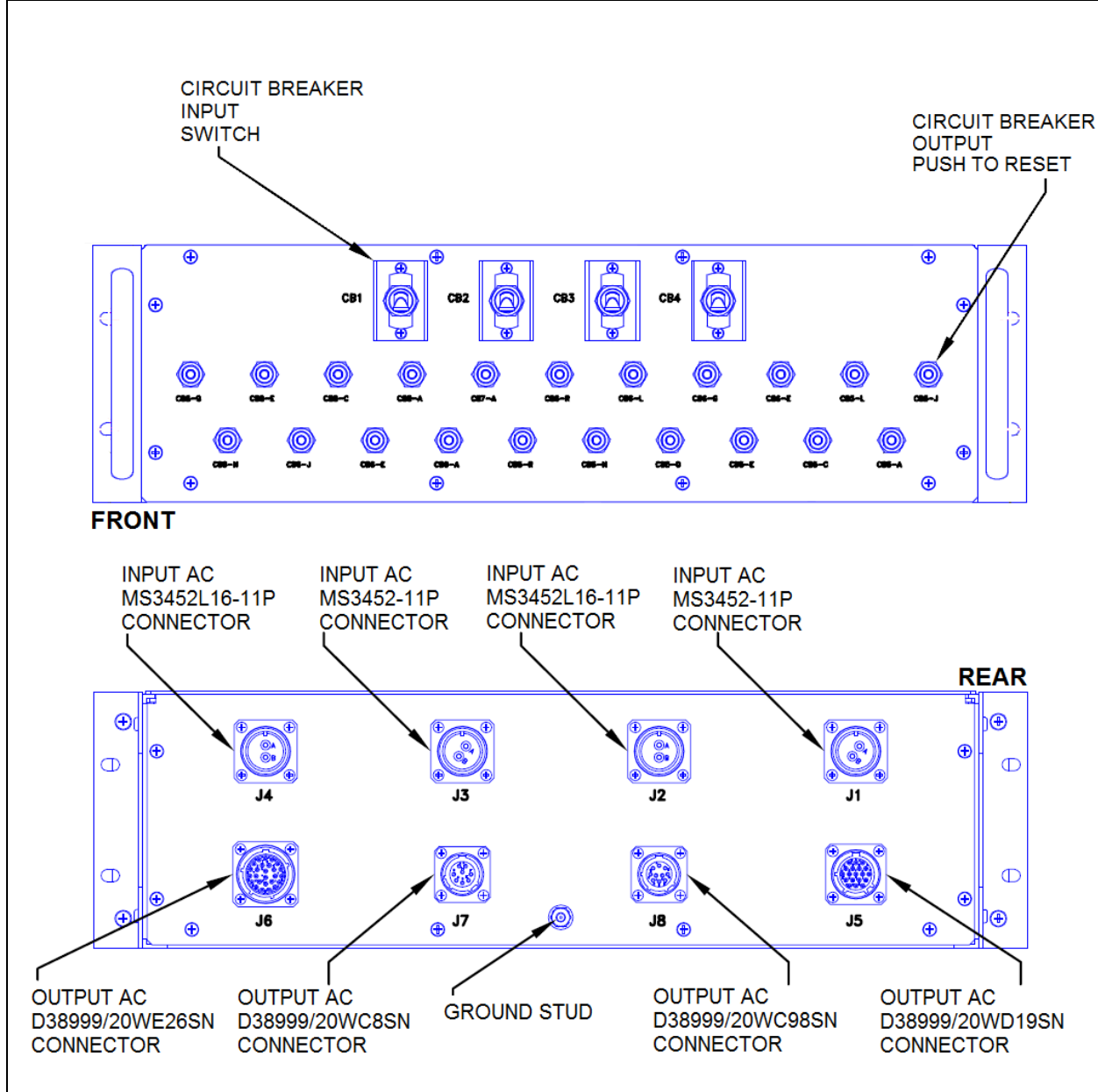


Figure E – 3U Rack Mountable Example

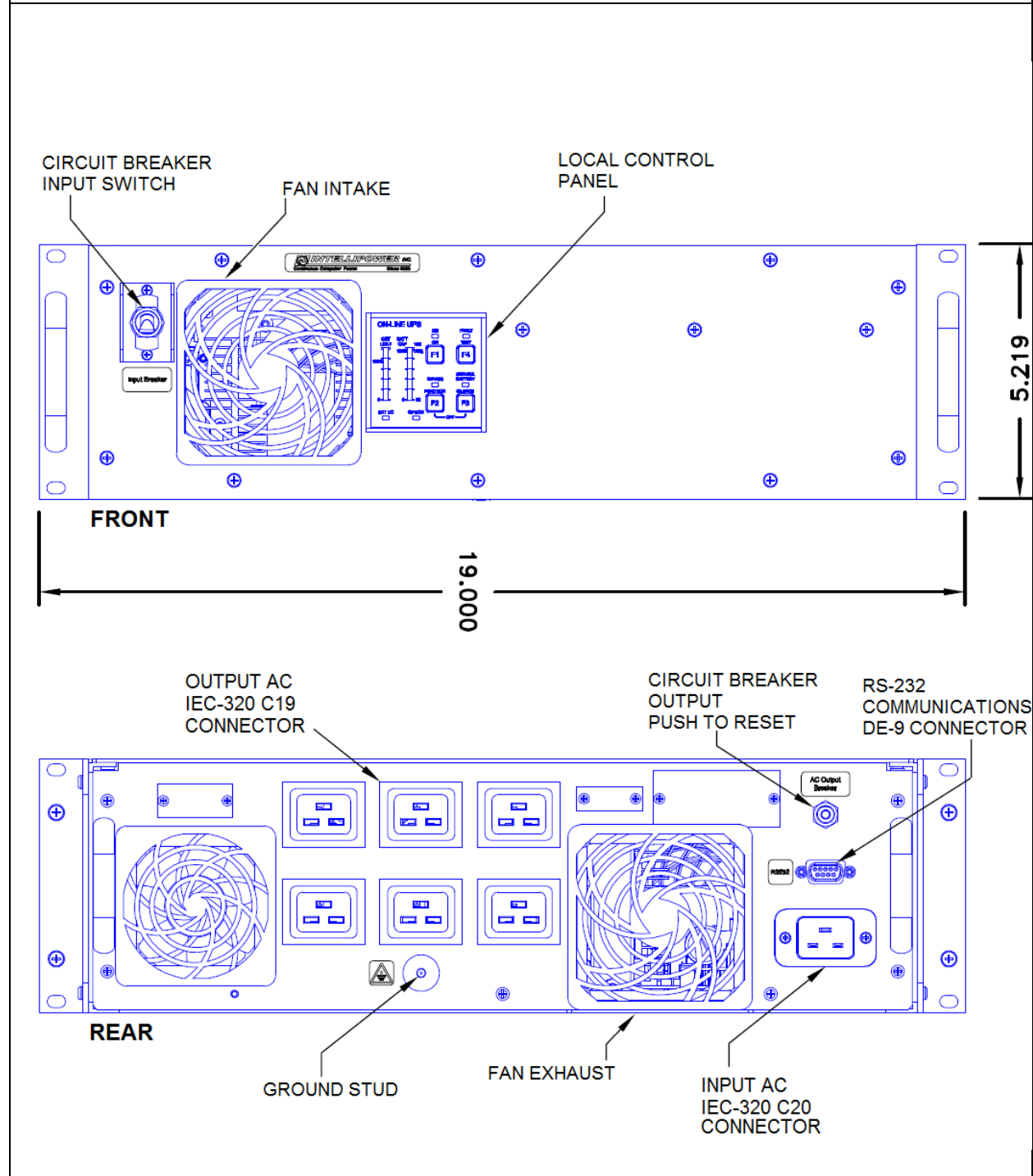


Figure F – EBP Example

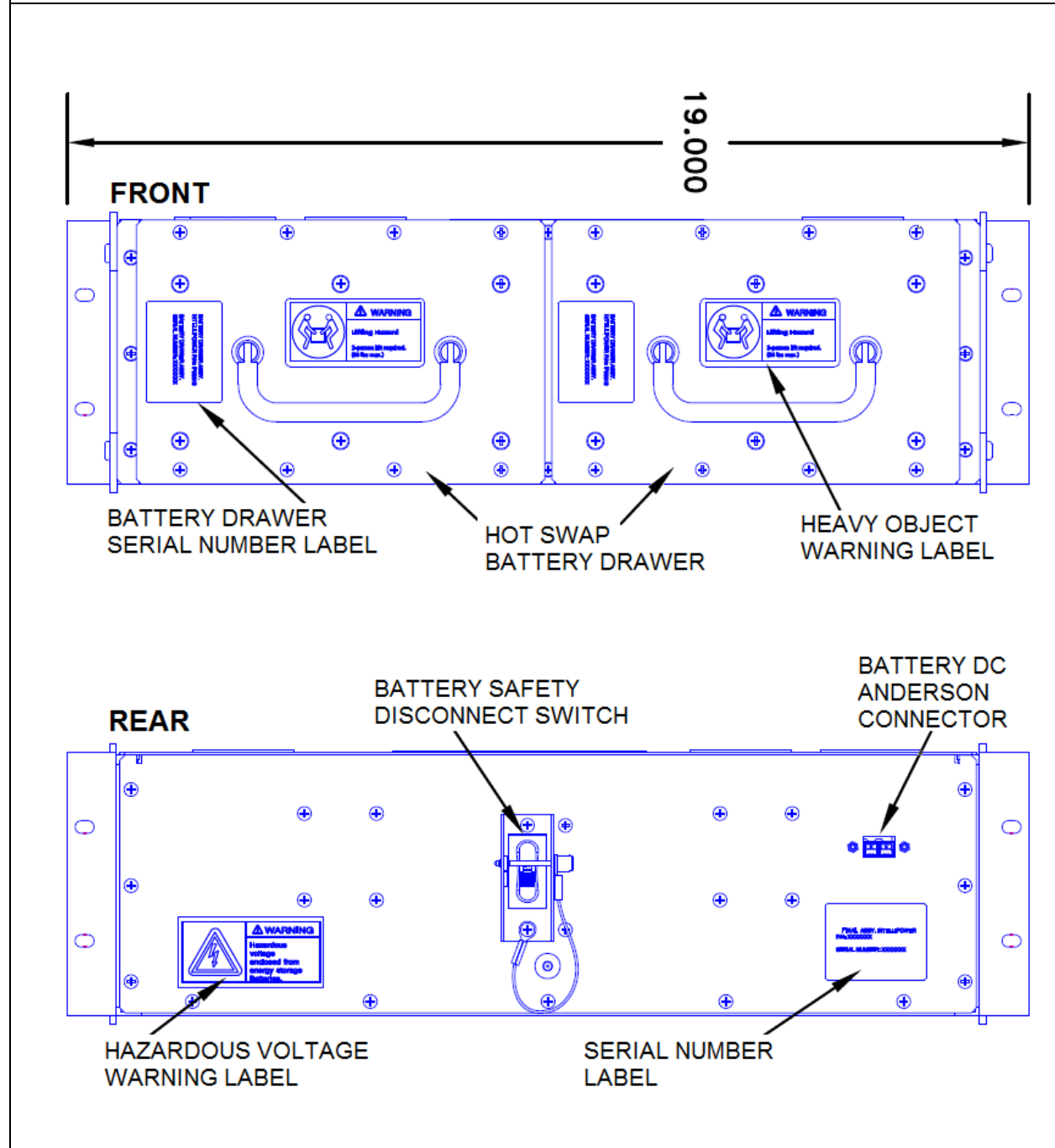
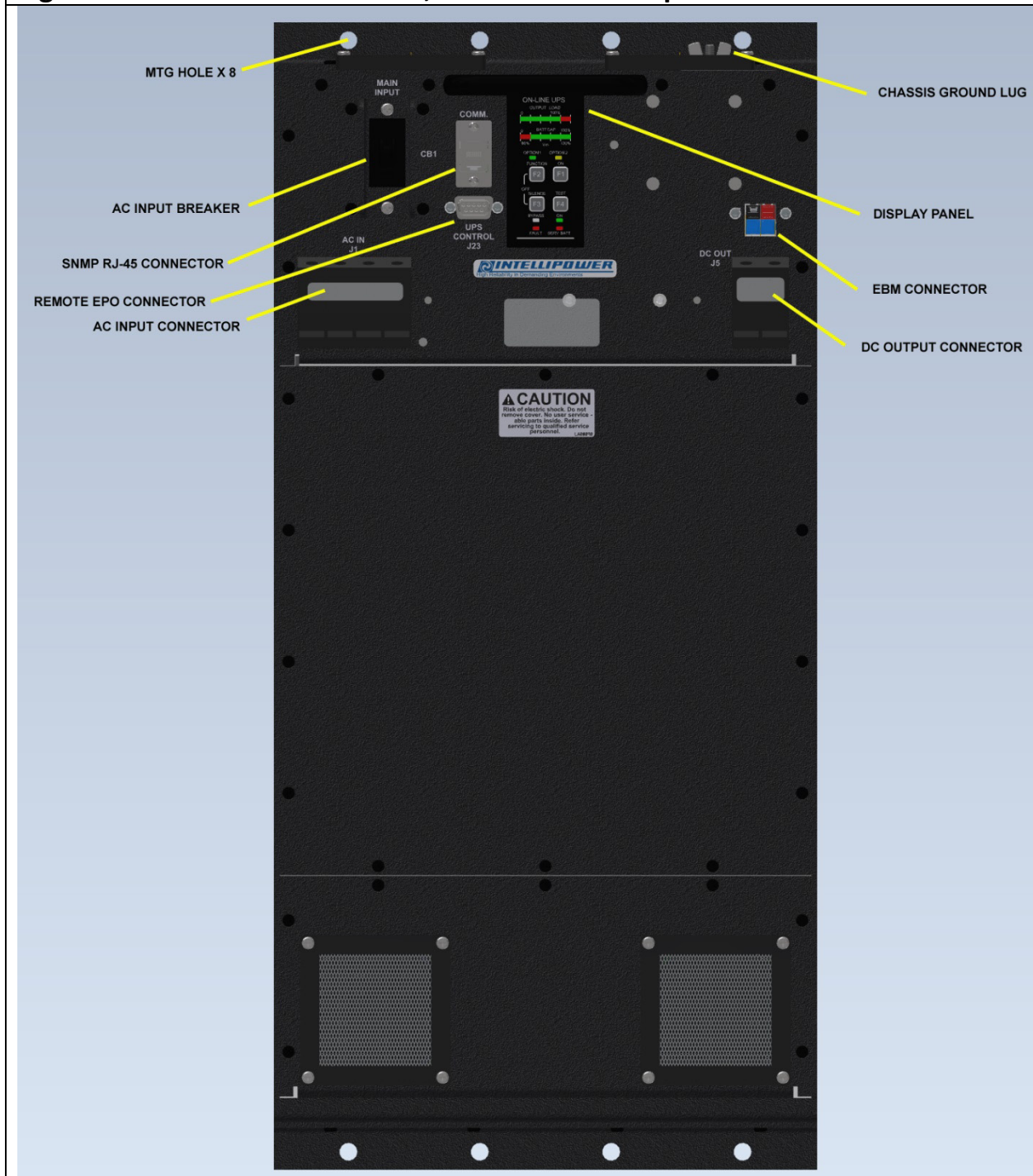


Figure G – Bulkhead Mount UPS, Front Panel Example



Local Panel 7

Several local panel configurations are available depending on the size and mounting style of the unit.

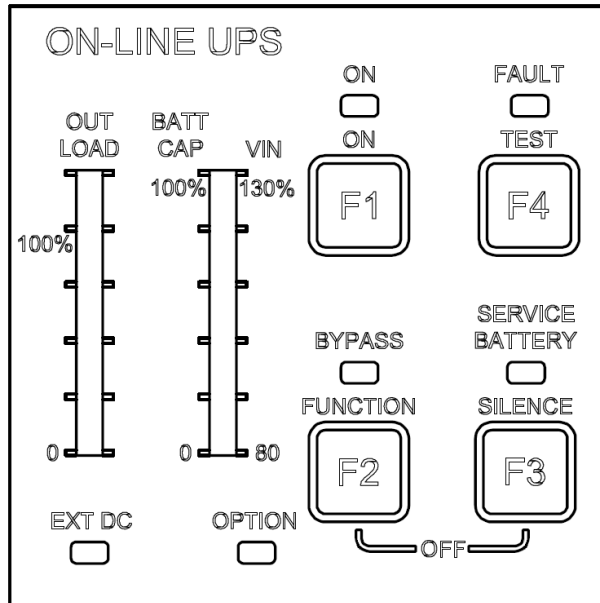


Figure PANEL-A

A Typical Description Table for PANEL-A LED'S

NOTE: EXACT PANEL LED CONFIGURATIONS MAY VARY WITH EACH SPECIFIC MODEL

DISPLAY PANEL LED INDICATOR SUMMARY TABLE		
LED NAME	LED COLOR	INDICATION FUNCTION
"ON"	GRN	AC Output Inverter is ON
"FAULT"	RED	AC Output Inverter Malfunction
"BYPASS"	YEL	Not Used
"SERVICE BATTERY"	RED	Battery is At or Near End of Life
"EXT DC"	GRN	DC Input is Present
"OPTION"	GRN	ON = 60 Hz Output, OFF = 50 Hz Output
"OUT LOAD"	4 GRN AND 1 RED	Output Load Current Percentage
"BATT CAP"	4 GRN and 1 RED	Battery State of Charge Indication

See Detailed Description of Panel Operation on Pages 24 through 29

ADDITIONAL DISPLAY PANEL CONFIGURATIONS

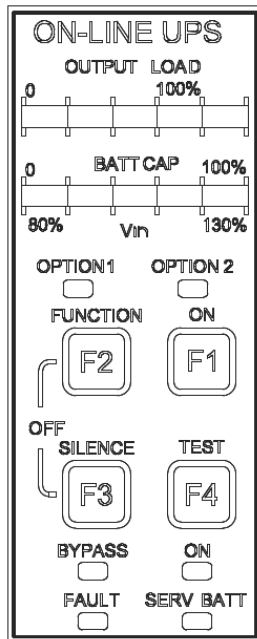


Figure PANEL-B

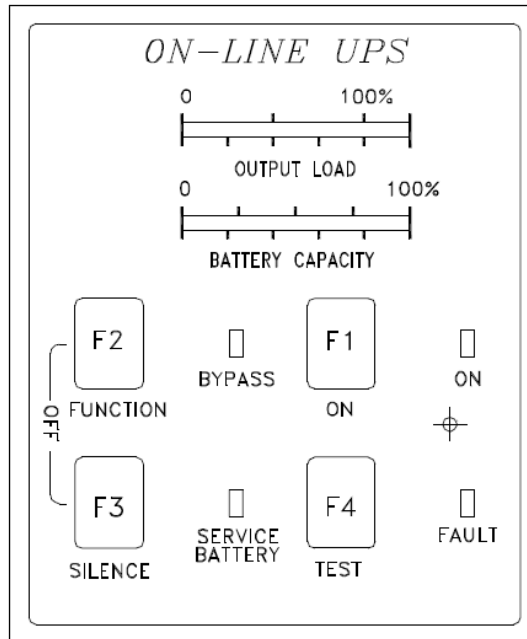


Figure PANEL-C

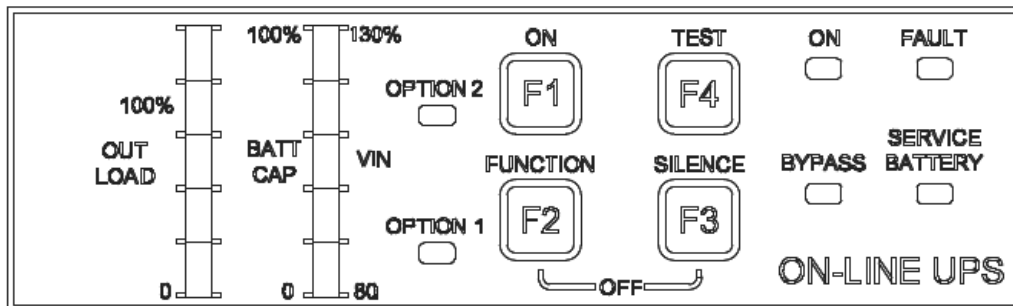


Figure PANEL-D

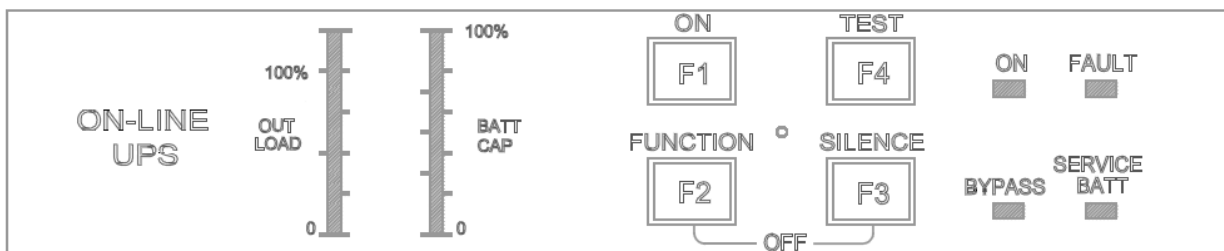


Figure PANEL-E

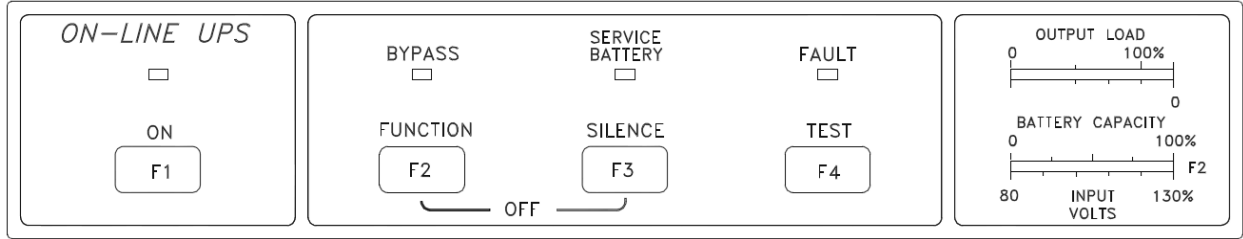


Figure PANEL-F

The function buttons have been designed with a safety feature against inadvertent operation. Buttons require a firm sustained pressure for 1 second to initiate a function.

BATT CAP 0 to 100% – Battery Capacity LED Meter (Pos 1 RED, Pos 2-5 GRN)			
Each of the five positions on the LED meter indicates a different level of battery capacity. If the LED is flashing, the unit is on battery as input power is not available. (Note: No more than one LED will flash at any given time, during the battery discharge interval.)			
Position	LED Status	Other Condition	Indication
1 (0% to 20%)	ON		Unit is on input power, batteries are charging. Battery capacity is critical, between 0 and 20%. LED is red.
	OFF		
	FLASHING	ON LED is ON	Unit is on battery power, batteries are discharging. Battery capacity is critical, between 0 and 20%. LED is red.
	FLASHING	ON LED is OFF	Unit is shutting down.
2 (21 to 40%)	ON		Unit is on-line power, batteries are charging. Battery Capacity is between 21% and 99%. Fast charging occurs at 80% or less of battery capacity.
	OFF		Battery Capacity is less than 21%.
3 (41 to 60%)	FLASHING		Unit is on battery power, batteries are discharging. Battery Capacity is between 21% and 99%.
	FLASHING	ON LED is OFF	Unit is shutting down.
4 (61 to 99%)	ON		Unit is on input power, batteries fully charged. Battery capacity is greater than 80%.
	OFF		Battery capacity is less than 100%
	FLASHING	ON LED is ON	Unit is on battery power, batteries are discharging. Battery capacity is between 100% and 80%.
	FLASHING	ON LED is OFF	Unit is shutting down.

BYPASS – LED (YEL)		
If the dynamic bypass feature is configured, the Bypass LED will light momentarily when a new load is switched on causing a heavy inrush current. The Bypass LED will stay lit with an audible alarm when a sustained overload exceeding rated output occurs.		
LED Status	Other Condition	Indication
ON		Bypass mode – filtered line power is straight through. Battery backup is not available.
OFF		Normal mode.
FLASHING		Input voltage is outside of specifications and unit is in Bypass mode.

EXT DC – LED (GRN)		
This LED is optional. If the indication column is blank, the option is not utilized in this configuration.		
LED Status	Other Condition	Indication
ON		Input DC is available.
OFF		Input DC is not available.
FLASHING		

FAULT – LED (RED)

Units with an auto bypass will go into bypass to power the load and allow time for graceful shutdown.

LED Status	Other Condition	Indication
ON		Inverter has malfunctioned due to an internal fault.
OFF		Normal mode.
FLASHING		

ON – LED (GRN)

Indicates inverter output status.

LED Status	Other Condition	Indication
ON		Inverter output is ON.
OFF		Inverter output is OFF.
FLASHING		Inverter is powering up to full output voltage.

OPTION – LED (GRN)

This LED is optional. If the indication column is blank, the option is not utilized in this configuration. Typical Option LED indication functions include “Battery Tray Engaged/Disengaged” or “50/60HZ Inverter Frequency”. See also “Advanced Programming Options”

LED Status	Other Condition	Typical Option Indication
ON		“Batt Tray Engaged” or “60 Hz”
OFF		“Batt Tray Disengaged” or “50 Hz”
FLASHING		

OUT LOAD 0 to 100% – Output Load LED Meter (Pos 1-4 GRN, Pos 5 RED)

Each of the 4 green LEDs within the bar represents approximately 25% of rated output power in terms of RMS VA or Watts, whichever is greater. Position 1 through 4 each represents 25% of load. LED positions may occasionally move back and forth due to variable loading.

Position	LED Status	Other Condition	Indication
1 (0 to 25%)	ON		>0 to 25% load
	OFF		0% load
	FLASHING		
2 (26 to 50%) 3 (51 to 75%) 4 (76 to 100%)	ON		25% to 100% load
	OFF		
	FLASHING		
5 (> 100%)	ON		Load is >= 100% and < 101 to 105%. Critical load. LED is red.
	OFF		
	FLASHING	Audible Alarm	101 to 105% or more load. Inverter output will turn OFF.
	FLASHING	Bypass Enabled	101 to 105% or more load. Unit will go to bypass.

SERVICE BATTERY – LED (RED)		
Indicates battery conditions.		
LED Status	Other Condition	Indication
ON		Charging time is greater than a continuous 12 or 24 Hours depending on unit configuration. Batteries may be at end of life or charger may be damaged. Hot Swap Drawer: Replace entire Hot Swap Drawer as an LRU. Fixed Internal Batteries: Return to Factory for Battery Replacement
OFF		
FLASHING		LED only flashes during Bank Configuration Mode for Advanced Programming.

VIN 0 to 130% – Voltage In LED Meter
 This LED is optional. If there is no further content here, the option is not utilized in this configuration.

F1 ON – BUTTON
 Autostart Default Configuration: UPS will Autostart when input power is applied.
 Manual Start Configuration: Push this button once to turn the output inverter ON. See “Advance Programming Features”

 If momentary bypass is configured, press and hold this button to enter momentary bypass mode.
 If the input voltage is outside of the specified range, the unit will not enter momentary bypass mode.

F2 FUNCTION – BUTTON
 This button is utilized in conjunction with the F3 button to turn off the inverter output.

F3 SILENCE – BUTTON
 Press this button once to silence an audible alarm.
 If unit is in an over-temperature or over-voltage state, the alarm cannot be silenced.

F4 TEST - BUTTON
 Push this button once to run a local panel LED test. This will help to pinpoint any faulty LEDs. This test can be performed while the unit is in normal operation without affecting power delivery to the load devices.
 Note: Panel LEDs are automatically tested in sequence during power up and power down.

(not labeled) F1 AND F2 – BUTTON

If configured, press F1 and F2 simultaneously to enter manual bypass. Press F1 and F2 again to re-enter normal mode.

F2 AND F3: OFF – BUTTON

Use this feature after loss or removal of AC power to shut down the UPS while it operates in battery run mode.

Press Simultaneously press F2 and F3 for at least one second to turn OFF the inverter output. Panel LED's will sequentially light and then sequentially extinguish over a 15 second interval, followed by the AC Inverter output, the panel display, and the fans, all shutting off.

(not labeled) F3 AND F4 – BUTTON

2-minute battery test: Function not available at this time.

F2 AND F4: ADVANCED PROGRAM – BUTTON – Overview / Warning

Warning! This operating mode is intended for advanced users. Do not activate without proper training, documentation, and instructions. In this mode, the unit functionality can be changed to follow parameters and rules outside of default specifications.

Memory for Programming:

The EEPROM memory is accessed via 3 switch banks. Each switch bank contains 10 switches. This provides a maximum total of 30 memory programming positions.

Entering Bank Configuration Mode:

Press F2 and F4 simultaneously for at least one second to enter bank configuration mode.

Note: Be sure to press F2 before F4 to avoid entering LED test.

Initially, the BYPASS – LED will be flashing when Bank Configuration Mode is first entered.

Abort Procedure Options if Advanced Program Mode is Entered Accidentally by Pressing F2 and F4:

- 1) Press F2 and F4 again to return to normal mode, OR
- 2) Wait 4 minutes without operating any function buttons. UPS will automatically return to normal mode.

Bank Selection Mode:

Press F2 to change switch banks.

Bank Selection Indication:

- Switch Bank 1: BYPASS – LED is flashing
- Switch Bank 2: SERVICE BATTERY – LED is flashing
- Switch Bank 2: FAULT – LED is flashing

Switch Selection Mode:

Each switch bank begins with Switch 1.

Press F4 to ascend upwards through switches 1 to 10 of each bank.

Press F3 to descend downwards through switches 10 to 1 of each bank.

Switch Selection Indication:

Flashing positions 1-10 on the “OUT LOAD” & “BATT CAP” meters will indicate which switch is selected.

Selected Switch is ON: ON – LED is ON

Selected Switch is OFF: ON – LED is OFF

Switch Selection State Change:

Press F1 to toggle the switch from OFF to ON.

Press again to toggle the switch from ON to OFF.

Saving Programming Changes:

Press F2 and F4 again to save changes and return to normal mode.

F2 AND F4: ADVANCED PROGRAM – BUTTON – 50/60 Hz Output Configure (if configured)

Caution: For Advanced Users Only. Read Overview / Warning Above

Press F2 and F4 simultaneously for at least one second to enter bank configuration mode.

Note: Be sure to press F2 before F4 to avoid entering LED test.

Check that the BYPASS – LED is flashing. This indicates that Bank 1 is selected.

(Note: If the SERVICE BATTERY – LED (Bank 2) or FAULT-LED (Bank 3) is flashing press F2 to toggle through the flashing LEDs until the BYPASS-LED (Bank 1) is flashing.)

You are now in Switch Bank 1, Switch 1.

If the ON – LED is ON, AC Inverter is operating at 60 Hz.

If the ON – LED is OFF, AC Inverter is operating at 50 Hz.

Press F1 to change the switch from ON to OFF or OFF to ON.

Press F2 and F4 again to save changes and return to normal mode.

NOTE: CONTACT AMETEK-INTELLIPOWER TECHNICAL SUPPORT FOR INFORMATION ABOUT OTHER FRONT PANEL PROGRAMMABLE SETTINGS THAT MAY BE AVAILABLE.

F2 AND F4: ADVANCED PROGRAM – BUTTON – Dynamic Bypass (if configured)

Note: For Advanced Users Only. Read Overview /Warning Above

Press F2 and F4 simultaneously for at least one second to enter bank configuration mode.

Note: Be sure to press F2 before F4 to avoid entering LED test.

Check that the BYPASS – LED is flashing. This indicates that Bank 1 is selected.

Press F2 twice.

Check that the Fault LED is flashing. This indicates that Bank 3 is selected.

(Note: If the BYPASS-LED (Bank 1) or SERVICE BATTERY – LED (Bank 2) is flashing press F2 to toggle through the flashing LEDs until the FAULT-LED (Bank 3) is flashing.)

Press F4 once.

You are now in Switch Bank 3, Switch 2.

If the ON – LED is ON, dynamic bypass is inhibited.

If the ON – LED is OFF, dynamic bypass is enabled.

Press F1 to change the switch from ON to OFF or OFF to ON.

Press F2 and F4 again to save changes and return to normal mode.

NOTE: CONTACT AMETEK-INTELLIPOWER TECHNICAL SUPPORT FOR INFORMATION ABOUT OTHER FRONT PANEL PROGRAMMABLE SETTINGS THAT MAY BE AVAILABLE.

F2 AND F4: ADVANCED PROGRAM – BUTTON – Auto/Manual Start Configure

Caution: For Advanced Users Only. Read Overview / Warning Above

Press F2 and F4 simultaneously for at least one second to enter bank configuration mode.

Note: Be sure to press F2 before F4 to avoid entering LED test.

Check that the BYPASS – LED (Bank 1) is flashing.

Press F4 once, to enter **Switch 2**.

You are now in Switch Bank 1, Switch 2.

If the ON – LED is ON, Auto Start is enabled.

If the ON – LED is OFF, Manual Start is enabled.

Press F1 to toggle the switch from ON to OFF or OFF to ON.

Press F2 and F4 again to save changes and return to normal mode.

Note: CONTACT AMETEK-INTELLIPOWER TECHNICAL SUPPORT FOR INFORMATION ABOUT OTHER FRONT PANEL PROGRAMMABLE SETTINGS THT MAY BE AVAILABLE.

F2 AND F4: ADVANCED PROGRAM – BUTTON – Return to Default Settings

Caution: For Advanced User Only. Read Overview /Warning Above

Press F2 and F4 simultaneously for at least one second to enter bank configuration mode.

Note: Be sure to press F2 before F4 to avoid entering LED test.

Check that the BYPASS – LED (Bank 1) is flashing.

Press F2 twice to select Bank 3.

Check that the Fault LED (Bank 3) is flashing.

Press F4 nine times, to select Switch 10.

You are now in Switch Bank 3, Switch 10.

If the ON – LED is ON, return to default is enabled.

If the ON – LED is OFF, return to default is disabled.

Press F1 to toggle the Switch from ON to OFF or OFF to ON.

Set the switch to ON.

Check that the ON – LED is ON.

Press F2 and F4 again to save changes and return to normal mode.

Completely shut down and restart the unit.

Note: CONTACT AMETEK-INTELLIPOWER TECHNICAL SUPPORT FOR INFORMATION ABOUT OTHER FRONT PANEL PROGRAMMABLE SETTINGS THAT MAY BE AVAILABLE.

Installation & Communications 8

Note: Contact AMETEK-Intellipower support for additional documentation and instructions.

Rack Mounting

Do not use hardware greater than 3/8" length for rack attachment.

Unless otherwise specified, AMETEK-IntelliPower enclosure mounting screws are #10-32 thread.

Screws should be installed with a locking agent such as Loctite® to prevent them from becoming loose or falling out.

®Loctite is a trademark of the Henkel Corporation.

Bulkhead Mounting

Use 5/16" screw hardware, suitable for attaching 0.38" diameter mounting holes.

I. RS-232 Communication Cable Options

1. RS-232 Communication cable options include:
 - a. DE-9 to DE-9 cable for host computers with RS-232 serial data ports
 - b. DE-9 to USB serial cable adapter devices for host computers with USB ports but no RS-232 serial data port.

Notes: i) RS-232 and SNMP/CIP serial communication are not supported simultaneously.

ii) Units with an SNMP or CIP rear panel selector switch:
The selector switch must be set for RS-232.

iii) Fixed configuration units:
The RS-232 cable connection to the SNMP/CIP module must be internally removed inside the unit. This requires top cover removal.

2. DE-9 to DE-9 cable connection table

a. Wire a DE-9 to DE-9 cable per table below.

Computer DE-9 Plug	Pin		Pin	AMETEK-IntelliPower Unit DE-9 Socket
RxD	2	←	2	TxD
TxD	3	→	3	RxD
GND	5		5	GND

b. Install the DE-9 to DE-9 cable between host computer serial port and unit serial port

3. USB to DE-9 cable adapter connections

- a. Obtain a USB to DE-9 cable adapter device. This converts the RS-232 serial data signal to a USB compatible serial data signal.
- b. Install the USB to RS-232 Cable Adapter, with the DE-9 end to the UPS and the USB connector to the host computer USB port.
- c. Windows Devices will then Assign a COMM port to the Adapter. Note the assigned COMM port number (COMM1, COMM3, COMM 3).

II. RS-232 Communication Software Options

1. RS-232 Communication software options include:
 - a. Upsilon 2000 (available from Ametek-IntelliPower on physical CD)
 - b. PuTTY: Available for free download at www.chiark.greenend.org.uk
 - c. Hyperterminal: Available for download at <https://www.hilgraeve.com>

III. RS-232 Communication Using Upsilon 2000 Software Option

2. Install the Upsilon 2000 software CD - shipped with the UPS - onto your host terminal PC and open the program.
3. Reference the Starting & Operating Chapter to connect cabling and start unit.
4. Set up terminal application. Select COMM port.
 - a. 9600 BAUD
 - b. 8 Bit
 - c. No Parity Bit
 - d. 1 Stop Bit
 - e. No Flow Control
5. If unit response is ^0, enter ^X.
6. Commands
 - d. H = User Help
 - e. E = Event buffer dump
 - i. Buffer can hold up to 256 events during operation and 32 events upon shutdown.
 - f. ? = Unit status and information ASCII screen dump

IV. System Management Using Upsilon 2000 Software for RS-232 Communication

1. Monitor

- a. Individual unit and basic system information including alarms.
- b. Input, output, load %, battery, and other instantaneous or historical measurements.
- c. Export and/or view event and data logging.
- d. Measurements displayed in table and graphical formats.

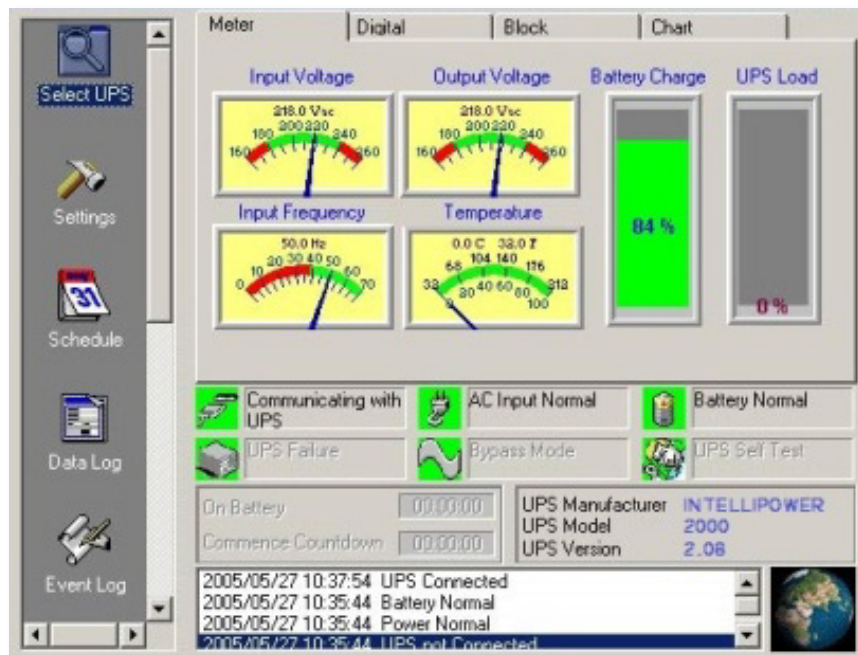


Figure RS232-A

2. Control Functions

- a. User access password protection.
- b. Turn OFF/ON unit output upon manual selection, conditional events, and scheduled events.
- c. Safely shutdown servers, workstations, and virtual machines upon conditional events and scheduled events.
- d. Change user interface language settings.

Ethernet SNMP Module

I. Communication with an SNMP Module

1. Connect 8P8C (RJ-45) Ethernet Cable from network to terminal on unit SNMP Module. For direct connection to computer utilize a crossover cable. For connection to a network router, utilize a straight through cable. Reference the Starting & Operating chapter to connect other cabling and start unit.
2. Allow SNMP Module to initialize – about two minutes – then start the network utility application.
3. If a non DHCP router or direct computer connection is used, set the IP address.
4. Open the web browser interface link from the network utility application and set the baud rate to 9600. Restart the unit.

II. System Management

1. Monitor
 - a. Individual SNMP agent, UPS basic system and network information including alarms upon selectable events.
 - b. Input, output, load percentage, battery capacity, and other instantaneous or historical measurements.
 - c. Export and/or view event and data logging.
 - d. Measurements displayed in table and graphical formats.

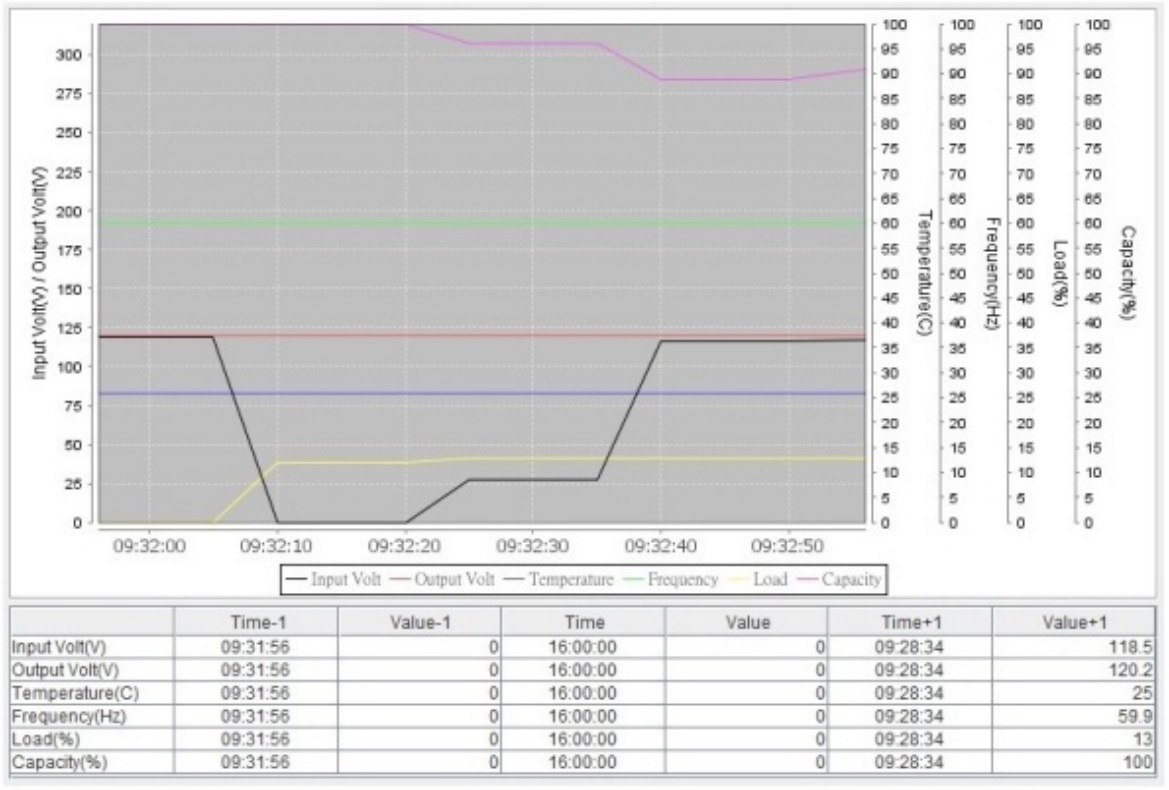


Figure SNMP-A

2. Control

- a. Network user access password protection.
- b. Turn OFF/ON unit output upon manual selection, conditional events, and scheduled events.
- c. Safely shutdown servers, workstations, and virtual machines upon conditional events and scheduled events.
- d. Change user interface webpage language settings.



Figure SNMP-B

III. Basic Configuration

A. The SNMP Agent Module



Figure SNMP-C

For quick start up, connect the SNMP Module to a computer utilizing a network router or switch that is DHCP enabled so that the IP address is automatically configured. Advanced users may create a static IP address for the SNMP Agent. Advanced users connecting modules directly to monitoring computers without a router or switch will have to manually configure the IP address and use a crossover cable. It is recommended to use the Chrome web browser.

- ‘Straight Through’ Ethernet cables must be used for connection from the SNMP Module to routers and other network equipment.
- “Crossover” Ethernet cables must be used for direct connections from the SNMP Module to a computer. A crossover cable swaps the serial data transmit and receive lines; otherwise, proper communication to a computer RJ-45 port will not occur.

B. Configuration with a DHCP Enabled Network Router

1. Install Netility on the computer workstation from the included NetAgent Utility CD.
2. Connect a straight through Ethernet cable from the unit SNMP Agent Module to the network.
3. Start up the unit.
4. Wait for the SNMP Agent in the unit to initialize – about 2 minutes.
5. Run Netility; the unit SNMP Agent listing should appear in the window. If the network utilizes DHCP or the Module has had previous configuration the address may have already been assigned. See Figure SNMP-D.
 - a. If there are multiple unit SNMP Agents on the network, it is easy to identify each different unit SNMP Agent on the list by referencing the last four digits of the SNMP Agent serial number printed on the Module.
 - b. If an IP address has not been assigned you may need to enable DHCP in the web interface. If so, skip to the next section, ‘Setting a Static IP Address or Configuration without a Network Router’.
 - c. If the listing does not appear in the window, select ‘Refresh List’, and/or check cabling connections.

6. To start the Web Interface, select the unit SNMP Agent listing in the window. Then either -
 - a. Select 'Launch Web User Interface' from the menu on the left.
 - b. Double click the unit SNMP Agent listing in the window.
7. If a password window appears, and none has been set; leave the input fields blank, select 'OK'.
8. On the menu select 'Configuration', 'UPS Configuration'; then set the UPS Communication type to 'SEC 9600'. Select 'Apply'. See Figure SNMP-F.
9. To confirm there is SNMP communication select 'Information, 'Current Status', 'Input Status'. If no communication is present, restart the unit.
10. If no communication is present after setting baud rate (9600), restart the unit.
 - a. Press and briefly hold F2 and F3 simultaneously to turn OFF the output inverter.
 - b. Toggle the input circuit breaker and switch to OFF.
 - c. Allow the unit to shut down completely.
 - d. Toggle the input circuit breaker and switch to ON.
 - e. Allow the unit to initialize and commence SNMP Agent Communication.
11. The interface panel of the module contains six indicating LEDs and one Ethernet port for 8P8C, RJ-45 modular connectors. Under normal operating conditions, the network LED will flash, the power LED will be ON, and the hourglass LED will be ON. Depending on network speed, the 100M or the 10M LED will flash.

C. Setting a Static IP Address

1. Install Netility on the computer workstation from the included NetAgent Utility CD.
2. Connect a straight through Ethernet cable from the unit SNMP Agent Module to the network.
3. Start up the unit.
4. Wait for the SNMP Agent in the unit to initialize – about 2 minutes.
5. Run Netility; the unit SNMP Agent listing should appear in the window. If the network utilizes DHCP or the Module has had previous configuration, the address may have already been assigned.
 - a. If there are multiple unit SNMP Agents on the network, it is easy to identify each different unit SNMP Agent on the list by referencing the last four digits of the SNMP Agent serial number printed on the Module.
 - b. If the target module listing does not appear in the window, select 'Refresh List', and/or check cabling connections.
6. Select the target unit SNMP Agent listing in the window then select 'Network Settings' from the menu on the left. See Figure SNMP-E. Select 'Use Following Static IP Address' then enter the necessary information in the IP address section.

7. To start the Web Interface, select the unit SNMP Agent listing in the window. Then either -
 - a. Select 'Launch Web User Interface' from the menu on the left.
 - b. Double click the unit SNMP Agent listing in the window.
 8. If a password window appears, and none has been set; leave the input fields blank, select 'Ok'.
 9. On the menu select 'Configuration', 'UPS Configuration'; then set the UPS Communication type to 'SEC 9600'. Select 'Apply'. See Figure SNMP-F.
 10. To confirm communication select 'Information, 'Current Status', 'Input Status'. If no communication is present, restart the unit.
 11. If no communication is present after setting baud rate (9600), restart the unit.
 - a. Press and briefly hold F2 and F3 simultaneously to turn OFF the output inverter.
 - b. Toggle the input circuit breaker and switch to OFF.
 - c. Allow the unit to shut down completely.
 - d. Toggle the input circuit breaker and switch to ON.
 - e. Allow the unit to initialize and commence SNMP Agent Communication.
 12. The interface panel of the module contains six indicating LEDs and one Ethernet port for 8P8C, RJ-45 modular connectors. Under normal operating conditions, the network LED will flash, the power LED will be ON, and the hourglass LED will be ON. Depending on network speed, the 100M or the 10M LED will flash.
- D. Direct Computer Connection – Configuration without a DHCP Enabled Network Router
1. Install Netility on the workstation from the included NetAgent Utility CD.
 2. Connect a crossover cable from the unit SNMP Agent Module to the computer RJ-45 jack.
 3. Start up the unit.
 4. Wait for the SNMP Agent in the unit to initialize – about 2 minutes.
 5. Run Netility; the unit SNMP Agent listing should appear in the window. If the network utilizes DHCP or the Module has had previous configuration, the address may have already been assigned.
 - a. If there are multiple unit SNMP Agents on the network, it is easy to identify each different unit SNMP Agent on the list by referencing the last four digits of the SNMP Agent serial number printed on the Module.
 - b. If the target module listing does not appear in the window, select 'Refresh List', and/or check cabling connections.

6. If a static IP address is needed or the module is being connected directly to a computer without a DHCP enable router, select the target unit SNMP Agent listing in the window then select 'Network Settings' from the menu on the left. See Figure SNMP-E. Select 'Use Following Static IP Address' then enter the necessary information in the IP address section.
 - a. The static IP address you enter should be the same as the computer it is connected to in all digits except for the last group. If a default gateway is present and the computer is running Windows XP, copy it over to the SNMP module.
 - i. Example:
 1. Computer
IP Address: 192.168.1.2
Subnet Mask: 255.255.255.0
 2. SNMP Module
IP Address: 192.168.1.3
Subnet Mask: 255.255.255.0
 - b. If Netility requests a default gateway and one is not present in the network, enter a default gateway IP address which equals the computer IP address.
 - i. Example:
 1. Computer
IP Address: 192.168.0.2
Subnet Mask: 255.255.255.0
Default Gateway: 192.168.0.2
 2. SNMP Module
IP Address: 192.168.0.3
Subnet Mask: 255.255.255.0
Default Gateway: 192.168.0.2
 7. To start the Web Interface, select the unit SNMP Agent listing in the window. Then either -
 - a. Select 'Launch Web User Interface' from the menu on the left.
 - b. Double click the unit SNMP Agent listing in the window.
 8. If a password window appears, and none has been set; leave the input fields blank, select 'OK'.
 9. On the menu select 'Configuration', 'UPS Configuration'; then set the UPS Communication type to 'SEC 9600'. Select 'Apply'. See Figure SNMP-F.
 10. To confirm communication select 'Information', 'Current Status', 'Input Status'. If no communication is present, restart the unit.
 11. If no communication is present after setting baud rate (9600), restart the unit.
 - a. Press and briefly hold F2 and F3 simultaneously to turn OFF the output inverter.
 - b. Toggle the input circuit breaker and switch to OFF.
 - c. Allow the unit to shut down completely.
 - d. Toggle the input circuit breaker and switch to ON.
 - e. Allow the unit to initialize and commence SNMP Agent Communication.

12. The interface panel of the module contains six indicating LEDs and one Ethernet port for 8P8C, RJ-45 modular connectors. Under normal operating conditions, the network LED will flash, the power LED will be ON, and the hourglass LED will be ON. Depending on network speed, the 100M or the 10M LED will flash.



Figure SNMP-D: Netility – Network Node Search



Figure SNMP-E: Netility – Configure IP Address

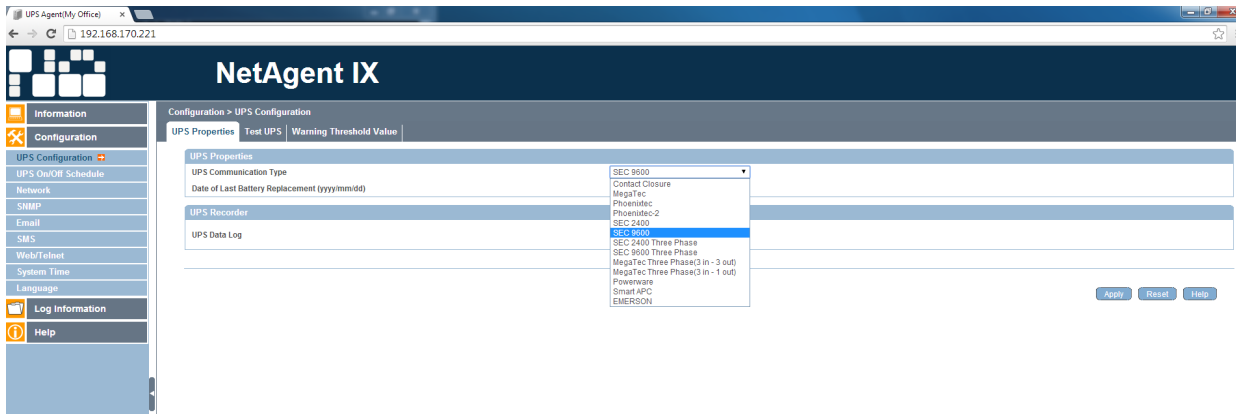


Figure SNMP-F: Web User Interface – Select Baud Rate

IV. Setting Network Utility Password

1. Open Netility on a network connected computer.
2. Select the target UPS from the list, right click and select settings; or select 'Network Settings' from the left hand menu. See Figure SNMP-G.
3. Select the password tab. See Figure SNMP-H.
 - a. Check 'Enable password setting'.
 - b. Enter a new password, then select 'OK'.
4. Now making changes to the SNMP Module network settings through Netility will require a password. See Figure SNMP-I.
5. To disable the password, uncheck 'Enable password setting' and enter your password.

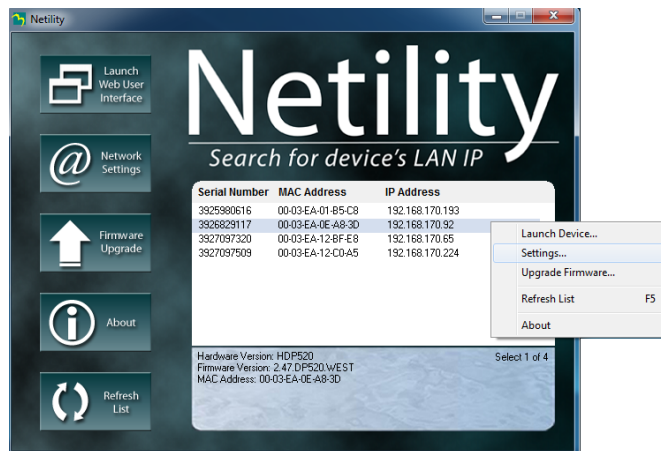


Figure SNMP-G: Netility – Configure IP Address

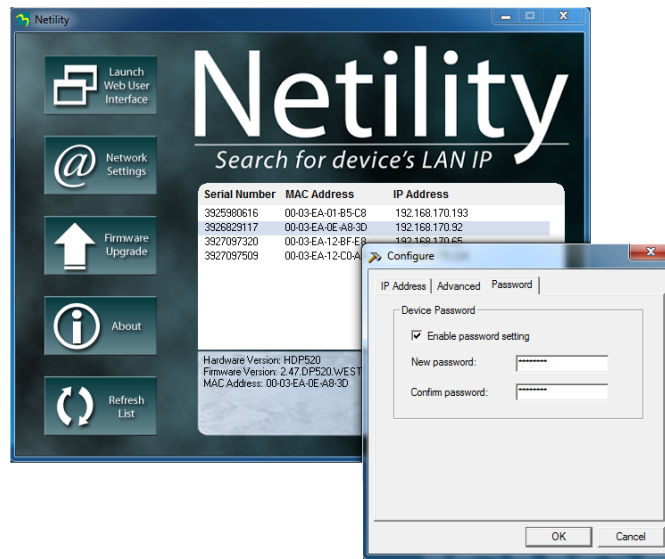


Figure SNMP-H: Netility – Configure IP Address

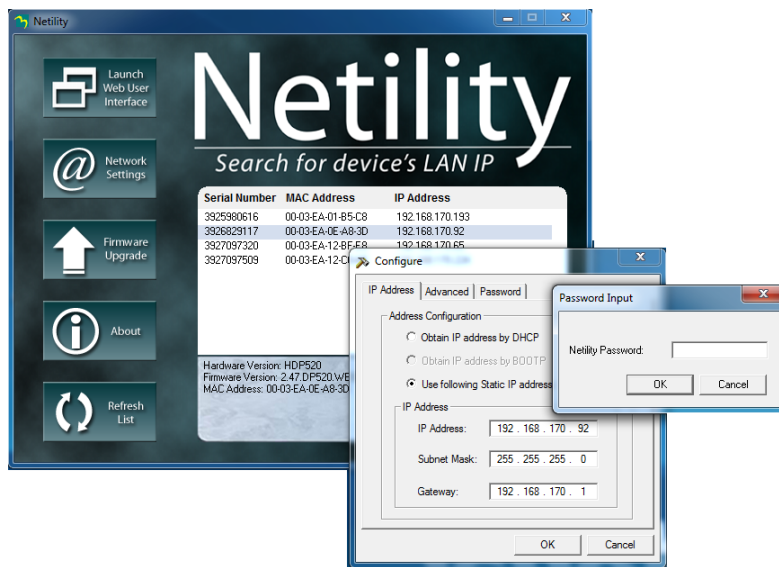


Figure SNMP-I: Netility – Configure IP Address

V. Setting Web Access Password

1. Open the web user interface of the target UPS.
2. Go to 'Configuration', 'Web/Telnet', 'User Account'. See Figure SNMP-J.
3. Enter a User Name and Password.
 - a. User Name must be within 31 characters.
 - b. Password must be within 31 characters.
4. Select from the permission drop down menu. At least one account must have 'Read/Write' permission.
5. IP Filter should be "*".*.*.*" to account for all clients.
6. Select 'Apply'.
7. The web browser will now prompt the user for a user name and password.

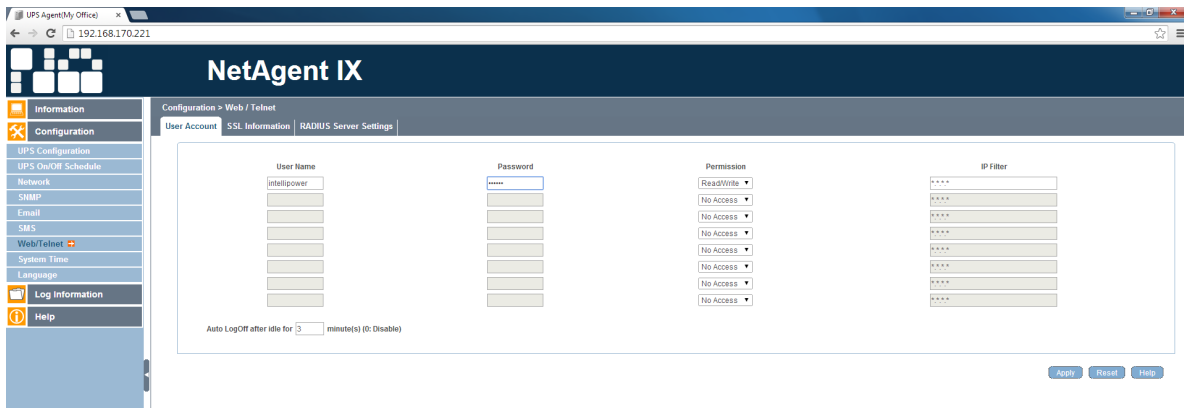


Figure SNMP-J: Netility – Configure IP Address

VI. Resetting SNMP Module Password

Each DA/DX/DY527 has its unique master password. This master password is printed on the label of each SNMP module. See example photo #1 and #2.

If the user Netility / Web password is forgotten or lost, please follow the procedure below with this unique master password to resolve it

1. Boot up a PC that is under same network as the NetAgent-SNMP module.
Otherwise connect a stand-alone PC to the RJ-45 port.
2. Open a web browser and type <http://xxx.xx/password.cgi>
(xx.xxx is the IP address of the NetAgent)
3. Enter ID: Type in "admin".
4. Password: Enter the master password for the device.
In the example photographs below the master password is "4FF26783"
5. Press continue and clear

Example Photo #1:



Rear panel view of SNMP module.
The administrator password is at the bottom of the module, marked: "4FF26783"

Example Photo #2:



Inside view of SNMP module with top cover of UPS removed.
The administrator password is at the bottom of the module, marked: "4FF26783"

Starting & Operating

9

NOTE: *The function buttons have been designed with a safety feature against inadvertent operation. Buttons require a firm sustained pressure for 1 second to initiate a function.*

1. Connecting System Cabling and Line Power.

- a. Make sure the Input Power Switch is OFF for all units.
- b. If possible, make sure load devices are powered OFF.
- c. Make sure the battery drawer is completely inserted (if applicable).
- d. Connect ground stud to rack ground with 12 Gauge or larger wire (if applicable).
- e. Connect EBP, EBC, PDU or External Battery Array cabling (if applicable).
- f. Connect communications cabling such as Ethernet, RS-232, or CIP (if applicable).
- g. Connect dry contact cabling (if applicable).
- h. Connect Output cabling. Do not connect load greater than unit power rating.
- i. Connect Input cabling.
- j. Double check all connections.

2. Load Devices.

- a. Note the unit power rating. Do not connect load greater than the unit power rating. For multiple load devices, plug in the critical load in to the unit outlets one at a time after unit startup – turn each load ON, one at a time. As you do so check the Output Load LED Meter (OUT LOAD) on the local panel. If the last LED in the meter turns ON or begins to flash you have overloaded the unit.
- b. Upon unit start up note the Battery Capacity LED Meter (BATT CAP). It is recommended that batteries are fully charged before connecting load.

3. Unit Startup.

- a. Turn ON the unit Input Circuit Breaker.

Local Panel LEDs will turn ON for approximately 5 seconds before running LED startup test. If the unit is set to Auto-start the inverter will begin to output power; otherwise use the front panel F1 ON button to turn ON the inverter output. When the ON LED stops flashing and remains ON the inverter output is operational.

4. Unit Output Control.

- a. To turn OFF the unit Output Inverter press F2 for one second. Then simultaneously press F3 for another one second.
- b. To turn ON the unit Output Inverter press F1.

5. Unit Shutdown.

- a. Hot Swap Battery Option (if applicable): Do not shut down the Unit with the battery drawer removed. Otherwise battery charge state information will be lost inside the UPS microcontroller.
- b. Turn OFF Input Circuit Breaker.
- c. If the ON – LED is ON (output inverter is operational), press F2 for one second. Then simultaneously press F3 for another 1 second to initiate shut-down sequence. If necessary, press F2 then F3 a second time.

Hot Swap (if applicable)

1. Removal

- a. Remove designated battery drawer screws.
- b. Use both hands to position the batteries in their normal, horizontal orientation, then gently remove the drawer.

2. Insertion

- a. Use both hands to position the batteries in their normal, horizontal orientation, then gently insert the drawer.
- b. Inspect the drawer mating surfaces to assure it is completely inserted.
- c. Fasten designated screws.

Cold Start (if applicable)

1. Unit Startup

- a. Press the Cold Start button. The unit will enter idle mode.
- b. Press the ON button on the Local Panel.

2. Unit Shutdown

- a. Press F2 for one second. The simultaneously press F3 for another 1 second.
- b. Depending on the configuration, F2 and F3 may need to be pressed twice.

Troubleshooting

10

Audible Alarm and LED Event Summary

Event	Audible Alarm	LED
Over Temperature – Ambient	Periodic beep	
Over Temperature – Heat Sink	Periodic beep	
Over Voltage	Periodic beep	EXT DC (if configured), FLASHING
Over-Load – Warning	Periodic beep	OUT LOAD 0 to 100%, FLASHING
Over-Load – Shutdown or Bypass	Continuous tone	OUT LOAD 0 to 100%, FLASHING
On Battery, Input AC Failure	Periodic beep	BATT CAP 0 to 100%, FLASHING
Low Battery, Input AC Failure	Continuous tone	BATT CAP 0 to 100%, FLASHING
Inverter Failure	Continuous tone	FAULT, ON
Battery Failure	Continuous tone	SERVICE BATTERY, ON

1	BATT CAP 0 to 100% – Battery Capacity LED Meter	
	Observation	Flashing
	Cause	Input power lost. Unit is on battery power.
	Action	Check to make sure the unit plug is still in the power receptacle. Check to make sure the Input Circuit Breaker is still in the ON position.

2	BATT CAP 0 to 100% – Battery Capacity LED Meter	
	Observation	Position 1 (bottom) flashing red.
	Cause	Low battery. 20% or less capacity remaining.
Action	If safe-shutdown software is running, no action is required. Safely shut down load devices.	

3	BATT CAP 0 to 100% – Battery Capacity LED Meter	
	Observation	Position 1 (bottom) is flashing red. Continuous tone audible alarm.
	Cause	Low battery. Shutdown imminent. The unit has been without input power and has reached the end of its battery run time.
Action	If safe-shutdown software is running, no action is required. Immediately execute safe shut down of load devices. Equipment may be disconnected from power at this point, depending on battery health and runtime specifications.	

4	OUT LOAD 0 to 100% – Output Load LED Meter	
	Observation	Red top position on the Output Load LED meter is flashing. Periodic beep audible alarm.
	Cause	The system is overloaded. Approaching shutdown load.
Action	Immediately reduce load devices.	

5	BYPASS – LED, Momentary Dynamic Bypass (if configured)	
	Observation	BYPASS – LED flashes for approximately 2 seconds. Momentary beep audible alarm.
	Cause	The unit is overloaded by the load or the start-up requirement of the load.
Action	The load on the unit has a high starting current requirement that is overloading the unit. It may be severely overloaded; some of the load devices must be removed.	

6	SERVICE BATTERY – LED	
	Observation	SERVICE BATTERY – LED is flashing. MODEL C Units Only
	Cause	Failing batteries.
	Action	Safely shut down load devices. Completely shut down and restart the system. If problem returns batteries may need to be replaced soon. Utilize only AMETEK-IntelliPower authorized batteries. Contact AMETEK-IntelliPower customer support to order batteries.
7	SERVICE BATTERY – LED	
	Observation	SERVICE BATTERY – LED is ON. Continuous tone audible alarm.
	Cause	The battery system of the UPS has failed.
	Action	Safely shut down load devices. Completely shut down and restart the system. If problem returns batteries may need to be replaced. Utilize only AMETEK-IntelliPower authorized batteries. Contact AMETEK-IntelliPower customer support to order batteries.
8	FAULT – LED	
	Observation	FAULT – LED is ON. Continuous tone audible alarm. ON – LED is OFF.
	Cause	The unit inverter may have failed.
	Action	Check that load is OFF. Completely shut down and restart the system. In order to not overwrite system error log, do not attempt more than one restart. If problem returns contact AMETEK-IntelliPower customer support.
9	Continuous Tone Audible Alarm	
	Observation	Continuous audible alarm. If configured, BYPASS-LED is ON. If enabled, red top position on the Output Load LED meter is ON.
	Cause	Unit may have been overloaded.
	Action	Reduce load. If enabled (new models), push ON – Button to return to normal mode. Alternatively: Safely shut down load devices then completely shut down and restart the system.
10	Periodic Beep Audible Alarm	
	Observation	No LEDs are flashing. Periodic beep audible alarm.
	Cause	Over-voltage warning or over-temperature warning. <ul style="list-style-type: none"> a. May be an over-voltage condition on the input. b. May be an over-temperature condition.
	Action	<ul style="list-style-type: none"> a. Confirm that the input voltage is within specified tolerance. b. Check and see if anything is blocking all fan inlets and outlets. Check and see if the fans are turning. Move the unit to an area with cooler temperatures or reduce the temperature of the environment.
11	Front Panel Controls	
	Observation	Front panel controls are not responding.
	Action	<i>Do not perform this operation if the unit has wide range power factor correction (WRPFC).</i> If enabled, push the microprocessor reset switch on the Local Panel with a small pin while AC Input power is ON. Note that the unit will momentarily turn the outputs OFF and restart the system.

12	Unit Does Not Provide Battery Backup	
	Observation	Input power is turned OFF. Unit shuts down rather than supporting load for specified battery run time.
	Action	If enabled, check that hot swap drawer is fully inserted and fastened. If enabled, check that the BYPASS – LED is OFF. Batteries may not be fully charged. Run the unit on Input power to charge the batteries.

HARD RESET INSTRUCTIONS IN THE EVENT OF CONTROLLER BOARD LATCH-UP

- 1) After AC input power is removed, and/or the AC input breaker is turned off, the UPS will go into battery run mode to ensure continuation of output power.
- 2) To finish turning off the UPS, press both F2 and F3 together on the front panel for several seconds.
- 3) The display lights on the front panel will then turn-on, then turn-off in sequence over about a 15 second interval. This lets the user know that the last state of the UPS is being stored in memory. After that, all panel lights, all fans, and then the AC output should completely shut-off.
- 4) On rare occasions, the controller board inside the UPS will lock-up and not shut down properly. On those rare occasions, you can disconnect the batteries in the UPS or External Battery Module (EBM) by one of two methods:
 - i) Unscrew the fasteners screws on each hot swap battery tray. Remove both battery tray(s) for one minute to ensure complete shut-off of the micro-controller, then re-insert the battery trays.
 - ii) (EBM Only) Remove any RED/BLK Anderson connectors at the rear of the UPS for one minute, then re-connect and secure again.
- 5) Once battery power has been re-applied, nothing in the UPS should turn back on; neither the fans, the display panel LED's, nor the AC Inverter output. Everything should remain off.
- 6) Re-apply AC input power and turn-on the AC input breaker switch. The UPS should start-up automatically, in normal sequence without the need to press the F1 button to activate the AC inverter.
- 7) If the batteries were discharged, due to the fans operating for an extended interval of time, you may need to allow at least 8 to 12 hours for the batteries to properly re-charge.

Glossary - Options & Features

11

Consult technical specifications and inspect your system visually for applicable components and features. Component & feature availability depends on system specifications.

Altitude: Distance to an arbitrary point above mean sea level. Pressure decreases as altitude increases. Internal components may expand and fail in low pressure environments. AMETEK-IntelliPower systems are designed to operate in elevations up to 10,000 ft or 69.7 kPa.

Anderson Connector(s): Typically utilized for connecting DC power between an external battery pack (EBP) and an uninterruptible power supply (UPS).

Application: The grounding characteristics of a unit depend on the type of vessel it is installed on. Shipboard applications represent water borne vessels such as boats, submarines, and floating rigs. Airborne applications represent planes, airships, and UAVs. Ground applications represent all vessels with a connection to earth such as buildings, cars, trains, etc. Shipboard applications often require that the neutral wire is floating. AMETEK-IntelliPower offers a switch that allows the user to toggle between bonding neutral to ground and un-bonding neutral to ground.

Auto Start: If auto start is enabled, the unit will turn ON the output from the inverter automatically after the input breaker is switched ON and the system powers up. See also Manual Start.

Batteries – Lead Acid: Lead-acid batteries offered by AMETEK-IntelliPower are maintenance-free and sealed. Lead-acid batteries typically have lower upfront costs compared to other battery types. Stored batteries should be recharged once every 3 months when they are stored at 22 $^{\circ}$ C. If the storage temperature exceeds 27 $^{\circ}$ C, the recharge frequency should be increased. See also Storage & Maintenance.

Batteries – Pure Lead Acid: Pure lead-acid batteries offered by AMETEK-IntelliPower are maintenance-free and sealed. Although the cost of pure lead-acid batteries is higher than lead-acid, pure lead-acid batteries have approximately 2X the shelf life of lead-acid, 3 to 5X the float life, and 50 to 100% greater full cycle capability. Pure lead-acid batteries can operate in a much greater temperature range than regular lead-acid batteries. Pure lead-acid batteries may be stored from up to 2 years at 25 $^{\circ}$ C. It is recommended that the battery voltage be measured every six months. Recharging is required once voltage readings approach 2.00 volts per cell. If the storage temperature exceeds 25 $^{\circ}$ C, the maintenance test frequency should increase. Although battery performance degrades as the temperature diverges from optimal, these batteries can operate in much higher and lower temperatures than lead-acid; and can operate in much lower temperatures than lithium iron phosphate. Do not charge Pure-Lead acid batteries in a gas-tight enclosure.

Batteries – Lithium Iron Phosphate: Lithium iron phosphate batteries offered by AMETEK-IntelliPower are maintenance-free and sealed. Although the initial cost of lithium iron phosphate batteries is higher than lead-acid, lithium iron phosphate batteries have approximately 2 to 2.5X the runtime, 50% the weight, and 10X the life. Lithium iron phosphate batteries do not outgas H² and are safe compared to conventional Lithium-Ion Cobalt.

Battery Drawer Alarm: The system reports if the battery drawer is removed or ajar.

Battery Minimum Run Time: Under specified operating conditions, the battery array will support a given output power level for a specified minimum amount of time.

Battery Safety Disconnect Switch: Disconnects power to the battery cables to prevent arcing when the cables are removed.

Battery String: Batteries connected in series.

Battleshort: If the unit is in battle short mode, it will ignore alarms that would normally initiate shutdown. The unit will continue to operate until the hardware fails. Battleshort functionality is important for systems that need to provide continuous protection in critical situations; where overall system survival trumps the conservation of individual components.

Briefcase UPS: A lightweight, easily portable UPS designed for power protection and backup. The case is resistant to water, weather, shock, and vibration.

Blackout Protection: When input line voltage drops to zero the system will transfer to battery power. The unit responds the same to a blackout as it will to severe brownouts that breach input voltage tolerance ratings.

Brownout Protection: In many cases, input line voltages are not consistent. Voltage will dip below and rise above designated ratings. AMETEK-IntelliPower systems will operate utilizing line power so long as it remains within input tolerances. The breadth of these tolerances depends on the configuration of the unit. Depending on system specifications, AMETEK-IntelliPower supports wide range/ global input ranges as well as discrete and standard tolerances. If input voltages breach tolerance levels, the system will transfer to battery power and continue to output power until battery run time expires.

Bulkhead Mount: An enclosure designed for mounting on a vertical surface in the hull of a maritime vessel. See also wall mount.

Bypass: If the system has the bypass feature configured, it may transfer the load over to a direct line from the input if certain conditions are met. The unit may enter three different bypass modes – manual, momentary, and permanent.

Manual

The user can force the unit into manual bypass by pressing F1 and F2 simultaneously. To return press F1 and F2 again simultaneously.

- a. Legacy Configurations: If the input voltage is not within the tolerance range and you press F1 and F2, the system will remember that you initiated bypass. If the input voltage is outside the tolerance range and bypass is manually initiated, the unit will go to bypass upon returning to the specified input voltage tolerance range.

Momentary/ Dynamic Bypass

- The inverter is temporarily overloaded: The system will transfer the load to the bypass circuit momentarily.

Permanent:

- The inverter encounters a sustained overload: The system will transfer the load to the bypass circuit until further operator action is taken.

External Bypass Switch

- For units with an external bypass switch, the unit must be placed into manual bypass locally before engaging the external switch.

Cabinet: Large external batteries and system components are all mounted together inside one enclosure. This enclosure will typically have lifting eyes or skids.

Circuit Breaker – Input Power Switch: Provides protection against faults, functions as an ON/OFF switch for the input power, and as a total system shutdown switch. The input switch or circuit breaker controls input electrical power to the unit. If this switch is accidentally turned off when the inverter is operating, the unit will act as if there

has been a power outage. The front panel Input Power Switch or Circuit Breaker should only be turned off when the unit is unplugged or is not going to be used for an extended period of time.

Circuit Breaker – Output Push to Reset: In the event of a fault on the output, this breaker will isolate the circuit. Upon a fault event, a small pin is partially released from the breaker casing. After removing overload, reset circuit breaker by pushing the pin back in to the breaker casing.

Circular Mil Connector(s): Plug and receptacle configurations built to military detail specifications (MIL-DTL) such as MIL-DTL-5015. Use a Circular Mil nomenclature table for referencing more information on connector types.

Cold Start: Allows the user to start the unit without AC input power present. Upon pushing the cold start button, the unit will begin to support a load on batteries until battery run time expires without the normal start up procedure, so long as the batteries are sufficiently charged. In older models, cold start may be turned off by pressing 'OFF' (F2 and F3 together) twice. In newer models pressing 'OFF' (F2 and F3 together) once is sufficient.

Cold Start – Remote: This function allows the user to start the unit without AC input power present from a remote source. Upon pushing the cold start button, the unit will begin to support a load on batteries until battery run time expires without the normal start up procedure, so long as the batteries are sufficiently charged. The unit may be turned off again via the remote control source.

Common Industrial Protocol (CIP): AMETEK-IntelliPower systems support common industrial protocol for industrial process automation, alarm monitoring systems and control applications. Use common industrial protocol to interface multiple AMETEK-IntelliPower systems with supported PLC, operator stations, and other industrial network devices. CIP is a trademark of the Open Device Net Vendors Association (ODVA).

Conformal Coating: Material that is applied to printed circuit board assemblies (PCBAs) to protect against moisture, dust, chemicals, and extreme temperatures.

D-subminiature Connector(s) – DE-9, DA-15, DB-25: DE-9 connectors are typically utilized for RS-232 serial communications interface and dry contacts; other configurations such as DA-15 and DB-25 which may support serial communications or dry contacts are found on some models.

Discrete Contacts: A set of metal contacts that communicate a single command or indication to an electrical component. If the contact is normally open, closing it will signal a device to perform a function such as turning on an output or signaling an alarm.

Dry Contacts: See discrete contacts.

Emergency Power Off (EPO): Upon operating this control, the unit will turn OFF the output and commence shutdown. This feature is incorporated remotely or through a control component (RED push button switch) mounted on the unit front panel.

EMI Filter: Reduces conducted and radiated electromagnetic interference (EMI).

Ethernet/IP: See Common Industrial Protocol. Ethernet/IP is a trademark of the Open Device Net Vendors Association (ODVA).

External Battery Charger (EBC): External enclosure that houses a large battery charger. These modules are typically utilized for fast charging of large battery banks.

External Battery Module (EBM): External enclosure containing a battery array. These modules are used to increase system runtime.

External Battery Pack (EBP): External enclosure containing a battery array. These modules are used to increase system runtime.

Fans: Fans are essential in maintaining appropriate internal temperatures. Care must be taken in ensuring that fans are not obstructed. Loose objects (paper, etc.) must not be placed near fan intakes.

Fan Filters – Dust: Protects internal equipment from most dry airborne particles. Pore density is given in pores per inch (PPI). Higher PPI protects against finer particles but requires greater pressure to push or pull air through the media.

Fan Filters – EMI: Where electromagnetic interference (EMI) standards must be met, EMI fan filters reduce electromagnetic radiation emanating from electrical components within a unit enclosure.

Fixed Batteries: Batteries are housed within the UPS enclosure. Unlike hot swap batteries, fixed batteries are not accessible without completely shutting down the UPS. Note: Opening the enclosure will void the warranty.

Galvanic Isolation: The input circuitry is physically disconnected or 'isolated' from the unit's internal circuitry and the output load. Isolation prevents unwanted current flow and reduces common mode noise.

Ground Stud: Exposed metal parts are connected to ground to prevent user contact with dangerous voltage in the event of a fault. This hardware is for grounding of conductive unit enclosures.

Hot Swap Battery Drawer: To inspect or replace system batteries, this drawer may be removed while the unit is operating and supporting a load. If the battery drawer is removed, the system cannot provide battery power in the event of blackouts, overloads, and etc. Do not use batteries that are not authorized by AMETEK-IntelliPower. Caution: It is not recommended to shut down the unit without the drawer completely inserted and fastened.

Humidity: Given that there is no condensation, the system will operate within specifications in environmental conditions measured at the given relative humidity range.

IEC Connector(s): Plug and receptacle configurations built to standards set by the International Electrotechnical Commission (IEC). For example, an IEC 60320 C13 connector, commonly referred to as IEC-320 C13, is a grounded receptacle rated for 10 Amps. Use an IEC nomenclature table for referencing more information on connector types.

Input Power Fuse: Legacy systems only: Protects the unit from extremely high current conditions or short circuits.

Input Frequency and Tolerance: Oscillations in electric charge flow of alternating current (AC) is measured in Hz. Units tolerate a range of input frequency in Hz based upon unit specifications.

Input Voltage AC and Tolerance: The unit will operate without batteries while input alternating current (AC) remains within this range. In many cases, input line voltages are not constant. Voltage will dip below and rise above designated ratings. AMETEK-IntelliPower systems will operate utilizing line power so long as it remains within input tolerances. The breadth of these tolerances depends on the configuration of the unit. AMETEK-IntelliPower supports wide range/ global input ranges depending on the unit specifications.

Input Voltage DC and Tolerance: The unit will operate without batteries while input direct current (DC) remains within this range. In many cases input line voltages are not constant. Voltage will dip below and rise above designated ratings. AMETEK-IntelliPower systems will operate utilizing line power so long as it remains within input tolerances. The breadth of these tolerances depends on the specifications of the unit.

Ingress Protection (IP) – IP65: An enclosure designed for high resistance against particles containing water and dust. The 6 signifies no ingress of dust. The 5 signifies water projected from a nozzle against the enclosure from any direction shall have no harmful effect.

Load Shedding: Individual loads are disconnected when their draw increases and creates a total load amount which requires greater current than the unit power rating.

Local Panel: Displays output load, battery capacity, and some status indications such as ON or OFF, Bypass, Fault, and Service Battery. Control functionality includes program settings, output inverter ON or OFF, alarm Silence, Manual Bypass, and more.

Management Information Base (MIB): The MIB is an ASCII text file which describes SNMP network elements as a list of data objects. It is used to translate the OID numbers to a human readable format where a programmer can modify or verify protocol functionality.

Manual Start: If manual start is enabled, the unit will not turn ON the output from the inverter automatically after the input breaker is switched ON and the system powers up. The inverter output can be turned ON by pressing F1 ON. See also Auto Start.

NEMA Connector(s): Plug and receptacle configurations built to standards set by the National Electrical Manufacturers Association (NEMA). For example a NEMA 5-15P is a grounded plug rated for 125VAC and 15 Amps. Use a NEMA nomenclature table for referencing more information on connector types.

Object Identifier (OID): Each data object called out in the MIB is represented by a string of numbers called an OID. Each digit in the OID string represents a junction point in a network path to find information on a SNMP network node.

On-Line Double Conversion: Provides superior output power quality when compared to other approaches such as Off-Line or Line Interactive. Input voltage is converted to DC at a rectifier. Output voltage is converted back to AC at an inverter. Batteries support a DC bus before the inverter. The load sees a clean, sine wave signal with input sags, surges, and noise reduced to tolerable levels on the unit output. Because the battery is connected directly with the rectifier and inverter, no switching is necessary in the event of a blackout. Supported equipment is assured superior protection from line power hazards. Battery life is greatly extended when compared to conventional approaches.

Output Circuit Breaker – Push to Reset: Will respond during a sustained overload or unit fault and interrupt the power to the output receptacles. In the event of an overload, a plastic pin will partially pop out of the breaker housing. After removing overload, reset the breaker by pushing the plastic pin back in.

Output Neutral Bonding Switch: In one position the switch will bond the output neutral to ground for land based applications or land based lab testing. The other position switches the output to an un-bonded configuration for shipboard based applications. This switch can be locked in either position.

Output Voltage AC and Tolerance: The unit will output this range of alternating current (AC) voltage in normal operating conditions.

Output Voltage DC and Tolerance: The unit will output this range of direct current (DC) voltage in normal operating conditions.

Output Frequency Follower: The unit will output the frequency encountered at the input given that it is within a specified tolerance.

Output Frequency Changer: The unit will output a specified frequency within a specified tolerance.

Overtemp: If the ambient temperature within the unit enclosure increases past a set threshold, the unit will shut down to protect itself from the possibility of damage.

Pole or Pad Mounted: An enclosure designed for mounting outdoors on a concrete pad or elevated on a pole in an external enclosure such as a NEMA 3R cabinet.

Power Conditioner: Depending on the configuration, unit can provide protection against sags, surges, spikes, voltage transients, frequency transients, harmonics, etc. It does not protect against blackouts, sustained over-voltage or brownout, above or below the unit rated input voltage tolerances.

Power Converter: Depending on unit configuration, unit will change the input to output characteristics such as frequency, voltage, and current, converting AC to AC or AC to DC.

Power Distribution Unit (PDU): Modules used to increase the quantity of output receptacles from a single input source.

Power Factor Correction (PFC): The power factor is the ratio of real power to apparent power. High power factor equates to more efficient energy transmission. When the power factor is unity, all energy supplied by the source is consumed by the load. Loads where current leads voltage are capacitive or leading. Loads where voltage leads current are inductive or lagging. Power factor correction mimics a resistive load, increasing the power factor. Units providing PFC also minimize input current harmonics so that the AC input current sine wave is matched to input voltage sine wave. For example, MIL-STD 1399 300B requires shipboard electric power systems that are designed to operate with a power factor of 0.8 lagging to 0.95 leading for Type I 60 Hz power systems. Maximum total harmonic distortion (THD) cannot be greater than 5% and maximum single harmonic distortion cannot be greater than 3% aside from the first harmonic.

Power Inverter: Changes direct current (DC) to alternating current (AC).

Power Rating: Specifies the amount of load the system is designed to accommodate.

Rack Ears: Mounting brackets that connect the front, rear, or both ends of the unit to the rack.

Rack Mount: An enclosure designed for mounting an electronic rack equipment within a cabinet.

Rack Unit: A fundamental unit of height regarding rack mountable equipment. 1U is equal to 1.75”.

Remote Power Management and Communications Protocol: Power management, alarm monitoring, automation, and control of multiple devices are available through AMETEK-IntelliPower communications. Optional software applications may include protocol supported network management systems (NMS), included software, or purchasable software packages. Supported protocols include SNMPv1, SNMPv2, SNMPv3, RS-232 and common industrial protocol (CIP) – Ethernet/IP. Dry Contact configurations are also available. CIP and Ethernet/IP are trademarks of the Open Device Net Vendors Association (ODVA). The following bullet list briefly summarizes the alarm reporting, status monitoring and control functionality supported. More options and functionality are available and listed in included and purchasable management software manuals.

- Input and Output Volts
- Input and Output Frequency
- Input and Output Status
- Unit Temperature
- Event History
- Battery Status
- Battery Current
- Battery Volts
- Battery Capacity
- Battery Runtime
- Over-Temperature Alarm
- Input Fail Alarm
- Output Fail Alarm
- Over-Load Alarm
- Battery Fail Alarm
- Estimated Time Remaining
- Output OFF and ON
- Shutdown after Delay
- Startup after Delay
- System Configuration

RS-232: A serial communications protocol, RS-232 stands for recommended standard 232. AMETEK-IntelliPower units typically interface RS-232 signals through a DE-9 D-subminiature connector. The protocol provides several monitoring and control features and functions. System status such as load, input voltage, and temperature may be reported to remote managing computers. Managing software can periodically query unit conditions to build logs, reports, and charts. Managing software can initiate safe operating system shutdown in the event of a power failure or other event. Remote operators can shut down and restart unit inverter output as well.

Safe Shutdown: AMETEK-IntelliPower provides solutions that support the safe shutdown of computers available on a network based upon selectable events such as input power failure or based upon a schedule.

Safe Shutdown and Virtualization: AMETEK-IntelliPower provides solutions that support the safe shutdown of virtual machines and hosts on platforms such as VMWare ESX, VMWare ESXi, and Microsoft HyperV. ESX and ESXi are trademarks of VMWare. HyperV is a trademark of Microsoft.

Sleep Mode: The system will shut down during battery operation when it has no load for a set amount of time. This prevents unnecessary discharging of the batteries.

SNMP: An Ethernet network protocol that makes each connected unit available on a wide area or local area network as a network node. SNMP stands for simple network management protocol. AMETEK-IntelliPower units interface SNMP data through an 8P8C, RJ-45 Ethernet port mounted on the SNMP Agent Module. This protocol provides several monitoring and control features and functions. System status such as load, input voltage, and temperature may be reported to remote managing computers. Managing software can periodically query unit conditions to build logs, reports, and charts. Managing software can initiate safe operating system shutdown in the event of a power failure or other event. Remote operators can shut down and restart unit inverter output as well.

SNMP Agent Module: Hardware that facilitates translation of the unit's RS-232 protocol to SNMP for availability on an SNMP compatible network, and facilitates the translation of management device queries to the node. The interface panel of the module contains six indicating LEDs and one Ethernet port for 8P8C, RJ-45 modular connectors. Under normal operating conditions, the network LED will flash, the power LED will be ON, and the hourglass LED will be ON. Depending on network speed, the 100M or the 10M LED will flash.

SNMP 2: The CPU is an ARM 50MHz 32Bit. The CPU's Flash memory is 1 MB. The Network speed is 10M/100M UTP. Supported internet protocols are TCP/IP, HTTP, SMTP, DHCP, Telnet, BOOTP, DNS, DDNS, PPPoE and IPv4. Supported MIB are RFC1628. SNMP 1 and SNMP 2 are supported but are both considered obsolete standards. The hardware for SNMP2 is labeled DP527.

SNMP 3: The CPU ranges over several generations of a 32-Bit ARM Cortex implementation, with processor speeds ranging 180MHz up to 600 MHz, and Flash memory capacity ranging from 8 MB to 128 MB. The typical network speed is 10M/100M UTP, with 1000M available in the latest hardware version. Supported internet protocols are TCP/IP, HTTP, SMTP, DHCP, Telnet, BOOTP, DNS, DDNS, PPPoE, IPv4, IPv6, HTTPS RADIUS, SSL, SSH, and SNTP. Supported MIB are RFC1628. SNMP 1, SNMP 2, SNMP 3, and PPC are supported. Information security cryptographic hash functions MD5 and SHA are supported. DES and AES encryption is supported. Web user interface is updated with additional functionality. The Hardware for SNMP3 is labeled by: DX527 (early generation), DY527 (middle generation), or DA527 (latest version).

Temperature: The system will operate as specified given that the ambient temperature is within the specified range.

Temperature Compensated Battery Charging: Protects and extends battery life. In high temperature environments, the charging current is limited to inhibit thermal runaway. In low temperature environments the charging current is increased to maintain performance.

Terminal(s) – terminal block, spring terminal, screw terminal: Connector types that enable inputs, outputs, communication wires, and power distribution to be hard wired directly to the unit. Each wire must be attached to the specific terminal on the block for which it is designated.

Three Phase Power: Line cables in this configuration incorporate 3 hot wires in order to generate, transmit, and distribute power to large loads more efficiently. Each wire carries an alternating current at a phase 120 degrees from each other. Therefore the voltage on any conductor reaches its peak at 1/3 of a cycle.

Transit Case: A deployable weather, vibration, and shock resistant container which contains a rack for mounting electrical equipment such as a UPSs, EBMs, computers, or other equipment types.

Uninterruptible Power Supply (UPS): An electrical device that protects equipment from variable input line power conditions whether they are derived from the grid, solar, generators, or other. These conditions include blackouts, brownouts, sags, surges, noise, voltage transients, frequency transients, spikes, and more. There are many approaches to power protection. All AMETEK-IntelliPower UPS are On-Line Double Conversion; proven to be best method for producing the highest quality output from the most variable input.

Vertical Mount. An enclosure designed for mounting on a horizontal surface.

Wall Mount. An enclosure designed for mounting on a vertical surface. See also bulkhead mount.

Zone 1. An enclosure designed to withstand explosions and extreme high temperatures. The enclosure is installed in an area where explosive gas atmosphere is likely to occur. A Zone 1 environment has between 10 and 1000 hours per year of gaseous flammable mixture present.

<h1>Support</h1>	<h1>12</h1>
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Business Hours

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RMA

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<h1>Returns</h1>	<h1>13</h1>
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If the unit is damaged, file a claim with the shipping carrier within 15 days after receipt of the package.

Request an RMA form from support; complete the form and return it. Further instructions will be provided.

Use the original box & foam packaging to avoid shipping damage. Heavy models may require a pallet. If the original packaging is damaged or not available, contact support for new packaging.

Shipping

- Before packing the system, be sure it is OFF.
- Keep system in original packing materials and shipping carton.
- Protect the system from moisture and weather.

<h1>Spare Parts</h1>	<h1>14</h1>
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For all spare parts requests contact AMETEK-IntelliPower support. For faster service get the unit part number, serial number, install date, part description and quantity required. Only authorized parts may be used for repair or replacement.

Warranty Policy

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AMETEK-IntelliPower Inc. Standard Limited Warranty Policy

(UPS, EBP (Extended Battery), Frequency Converter, Transformer, NetAgent; UPSilon; Software, AMETEK-IntelliPower-Supplied Accessories)

AMETEK-IntelliPower Incorporated warrants this equipment, when properly applied and operated within specified conditions, against faulty materials or workmanship for the period of one year. The warranty period is classified as one year from date of shipment and is limited to repair or replacement during the warranty period at the sole discretion of AMETEK-IntelliPower Inc. All warranty service is performed on a depot basis by AMETEK-IntelliPower Customer Service Department. It is the responsibility of the customer to notify and return the defective product to AMETEK-IntelliPower at the address below. All costs for shipment of the product to AMETEK-IntelliPower shall be paid by the Customer. Costs to return the repaired or replacement product to the Customer shall be paid by AMETEK-IntelliPower Inc. within the continental USA and will be made by UPS Ground or equivalent shipment. If the defective product is outside the US, shipment (return freight) may be made by either of two options; (1) AMETEK-IntelliPower will ship to a designated US port will be provided by AMETEK-IntelliPower and will be made by UPS Ground or equivalent shipment. (2) For required shipments outside the continental USA, shipping costs shall be paid by the customer. Export taxes, duties or other surcharges will be paid for by the user. The defective product must be returned intact and shall appear to AMETEK-IntelliPower upon inspection that the failure of the product was caused by defective material or workmanship. Such repair or replacement shall be made free of charge if the defect is determined to be caused from faulty material and/or workmanship, the unit is within the warranty period, and AMETEK-IntelliPower was notified within the warranty period.

The warranty shall be void if (a) the equipment is damaged by the customer, is improperly used, is subjected to an adverse operating environment not supported by AMETEK-IntelliPower specifications, or is operated outside the limits of its electrical specifications; (b) the equipment is repaired or modified by anyone other than AMETEK-IntelliPower or AMETEK-IntelliPower-approved personnel; or (c) has been used in a manner contrary to the products operating manual or other written instructions. When an alarmed failure suggests that the AMETEK-IntelliPower equipment may be faulty, whether in or out of the warranty period, AMETEK-IntelliPower Customer Service should be notified at the phone number below. Upon receipt of this notification, the Customer Service Department will provide the assistance required to obtain repair or replacement of the equipment.

AMETEK-IntelliPower will not be liable for any associated costs incurred by the user, installing contractor, or wholesaler as a direct or indirect result of failure or in the replacement of defective in-warranty material. Product evaluation may be subject to a minimum inspection and handling charge of \$250.00 plus and all transportation charges.

The customer MUST obtain a return/replacement authorization with RMA number from AMETEK-IntelliPower Customer Service Department before returning a product for warranty service. The return authorization number MUST be placed on the outside of the shipping box and the equipment must be packaged securely to avoid shipping damage. Use original packaging as supplied by AMETEK-IntelliPower or call for new shipping boxes to protect product during shipment. If product is heavy (greater than 95 lbs.), it must be secured to a pallet for shipment. If questions arise, call AMETEK-IntelliPower for details in addition to using AMETEK-IntelliPower's engineered packaging materials.

The warranty is expressly in lieu of all other warranties, expressed or implied, including, without limitation, any implied warranty or merchantability or fitness for a particular purpose, and/or any other obligation or liability on the part of AMETEK-IntelliPower Inc. The sole exclusive remedy for breach of any warranty, expressed or implied, concerning AMETEK-IntelliPower's products and the only obligation of AMETEK-IntelliPower hereunder, shall be the repair or replacement of defective equipment, components, or parts, or, at AMETEK-IntelliPower's option, the refund of the purchase price or substitution with a new replacement product. AMETEK-IntelliPower shall in no way be responsible for any consequential damages, of any kind, or nature whatsoever, resulting from the breach of any warranty.

AMETEK-IntelliPower Incorporated

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<h1 style="margin: 0;">Revision Log</h1>	<h1 style="margin: 0;">16</h1>
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Rev	ECN	Description	Date
K	104469	Added revision log. Made recharge time dependent on specific model in chapter 4. Added hot swap and cold start steps in chapter 9. Updated troubleshooting step 11 to reflect specific procedure for WRPFC enabled units	03/13/17
L	104647	Renamed from General Components & Features chapter to Glossary - Options & Features; and moved the chapter to the position following the Troubleshooting chapter. Added extended storage maintenance charging table for lithium batteries.	12/15/17
M	105136	Added Basic Configuration, Setting Network Utility Password, and Setting Web Access Password to Chapter 7 Installation & Communications. Page numbering changed to start at front page and end at last page.	01/29/2018
N	105644	Corrected wording in Troubleshooting Chapter, 10. Periodic Beep Audible Alarm, Action, a.	07/13/18
P	107609	Added Ametek-IntelliPower logo.	3/26/2020
Q		Rewrote and Re-organized Various Sections of Manual	08-17-2020 to 09-22-2022

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