



Powerware

Powerware® 9140 UPS
7.5–10 kVA
User's Guide

Class A EMC Statements

FCC Part 15

NOTE This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

ICES-003

This Class A Interference Causing Equipment meets all requirements of the Canadian Interference Causing Equipment Regulations ICES-003.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

EN 50091-2

Some configurations are classified under EN 50091-2 as "Class-A UPS for Unrestricted Sales Distribution." For these configurations, the following applies:

WARNING This is a Class A-UPS Product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take additional measures.

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Requesting a Declaration of Conformity

Units that are labeled with a CE mark comply with the following harmonized standards and EU directives:

- Harmonized Standards: IEC 61000-3-12
- EU Directives: 73/23/EEC, Council Directive on equipment designed for use within certain voltage limits
93/68/EEC, Amending Directive 73/23/EEC
89/336/EEC, Council Directive relating to electromagnetic compatibility
92/31/EEC, Amending Directive 89/336/EEC relating to EMC

The EC Declaration of Conformity is available upon request for products with a CE mark. For copies of the EC Declaration of Conformity, contact:

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Koskelontie 13
FIN-02920 Espoo
Finland
Phone: +358-9-452 661
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Special Symbols

The following are examples of symbols used on the UPS or accessories to alert you to important information:



RISK OF ELECTRIC SHOCK - Indicates that a risk of electric shock is present and the associated warning should be observed.



CAUTION: REFER TO OPERATOR'S MANUAL - Refer to your operator's manual for additional information, such as important operating and maintenance instructions.



This symbol indicates that you should not discard the UPS or the UPS batteries in the trash. This product contains sealed, lead-acid batteries and must be disposed of properly. For more information, contact your local recycling/reuse or hazardous waste center.



This symbol indicates that you should not discard waste electrical or electronic equipment (WEEE) in the trash. For proper disposal, contact your local recycling/reuse or hazardous waste center.

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Chapter 1 Introduction

The Powerware® 9140 uninterruptible power system (UPS) protects your sensitive electronic equipment from the most common power problems including power failures, power sags, power surges, brownouts, line noise, high voltage spikes, frequency variations, switching transients, and harmonic distortion.

Power outages can occur when you least expect it and power quality can be erratic. These power problems have the potential to corrupt critical data, destroy unsaved work sessions, and damage hardware — causing hours of lost productivity and expensive repairs.

With the Powerware 9140, you can safely eliminate the effects of power disturbances and guard the integrity of your equipment. Figure 1 shows the Powerware 9140 UPS with an optional Extended Battery Module (EBM).

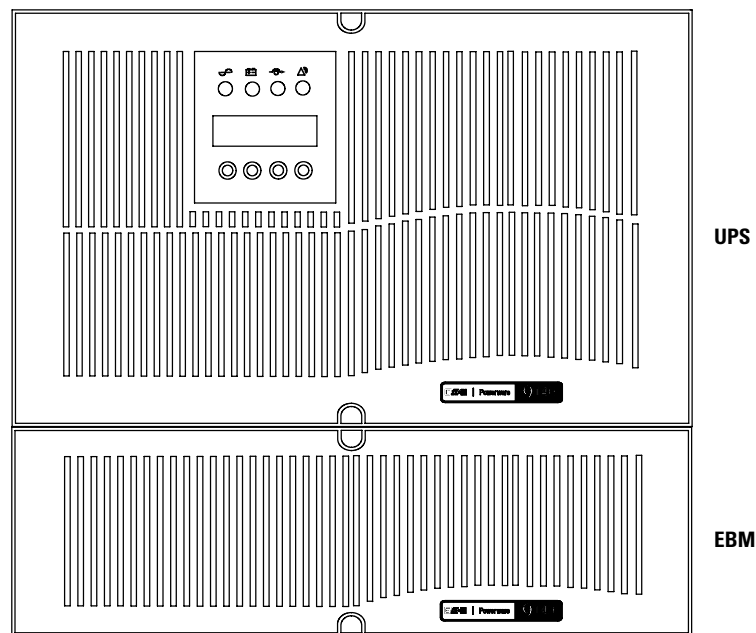


Figure 1. The Powerware 9140 UPS with Optional EBM

Providing outstanding performance and reliability, the Powerware 9140's unique benefits include the following:

- Online, double-conversion, high-frequency UPS design with pure sine wave output and power-factor correction. The UPS filters and regulates incoming AC power and provides consistent power to your equipment without draining the battery.
- For hardwired models, choice of operation mode between single-phase input mode and three-phase input mode.
- 6U rack height with the highest power density for a 10000 VA UPS.
- ABM® technology that uses advanced battery management to increase battery service life, optimize recharge time, and provide a warning before the end of useful battery life.
- Extended runtime with up to four EBMs.
- Start-on-battery capability for powering up the UPS even if utility power is not available.
- Easily replaceable electronics module and batteries that simplify maintenance by allowing you to replace them safely without powering down the critical load.
- Emergency shutdown control through the remote emergency power-off (REPO) port, or the option to configure the REPO port as a remote on/off (ROO) function.
- Two standard communication options with a USB port and two DB-9 serial ports (one DB-9 port is reserved for service use).
- Optional X-Slot® cards with enhanced communication capabilities for increased power protection and control.
- Firmware that is service upgradable through the X-Slot or DB-9 ports.
- Advanced power management with the Software Suite CD for graceful shutdowns and power monitoring.
- Backed by worldwide agency approvals.

Chapter 2 Safety Warnings

IMPORTANT SAFETY INSTRUCTIONS SAVE THESE INSTRUCTIONS

This manual contains important instructions that you should follow during installation and maintenance of the UPS and batteries. Please read all instructions before operating the equipment and save this manual for future reference.



DANGER

This UPS contains **LETHAL VOLTAGES**. All repairs and service should be performed by **AUTHORIZED SERVICE PERSONNEL ONLY**. There are **NO USER SERVICEABLE PARTS** inside the UPS.



WARNING

- This UPS contains its own energy source (batteries). The output receptacles may carry live voltage even when the UPS is not connected to an AC supply.
- The output receptacles may have live voltages even in Standby or remote emergency power-off (REPO) mode. For example, with line-to-line input wiring (208V line-to-line, single-phase), the voltage at the output receptacles is 110–120V (measured from neutral-to-ground).
- Do not remove or unplug the input cord when the UPS is turned on. This removes the safety ground from the UPS and the equipment connected to the UPS.
- To reduce the risk of fire or electric shock, install this UPS in a temperature and humidity controlled, indoor environment, free of conductive contaminants. Ambient temperature must not exceed 40°C (104°F). Do not operate near water or excessive humidity (95% maximum).
- For all UPS models, overcurrent protection for the input and output AC circuit(s) is to be provided by others. To reduce the risk of fire, connect only to a circuit provided with branch circuit overcurrent protection for 60 amperes (10 kVA models) or 50 amperes (7.5 kVA models) rating in accordance with the NEC, ANSI/NFPA 70.
- For all UPS models, suitably rated disconnect switches for the output AC circuit(s) are to be provided by others. To reduce the risk of fire, connect only to a circuit provided with branch circuit overcurrent protection for 50 amperes rating in accordance with the NEC, ANSI/NFPA 70.
- High leakage current. Earth connection is essential before connecting supply.



CAUTION

- Risk of electric shock. Battery circuit is not isolated from AC input. Hazardous voltages might exist between battery terminals and ground. Test before touching.
- Batteries can present a risk of electrical shock or burn from high short-circuit current. Observe proper precautions. Servicing should be performed by qualified service personnel knowledgeable of batteries and required precautions. Keep unauthorized personnel away from batteries.
- Proper disposal of batteries is required. Refer to your local codes for disposal requirements.
- Never dispose of batteries in a fire. Batteries may explode when exposed to flame.

Sikkerhedsanvisninger

VIGTIGE SIKKERHEDSANVISNINGER GEM DISSE ANVISNINGER

Denne manual indeholder vigtige instruktioner, som skal følges under installation og vedligeholdelse af UPS'en og batterierne. Læs venligst alle instruktioner inden betjening af udstyret og gem denne manual mhp. fremtidige opslag.



FARE

Denne UPS indeholder LIVSFARLIG HØJSPÆNDING. Alle reparationer og vedligeholdelse bør kun udføres af en AUTORISERET SERVICE TEKNIKER. Ingen af UPS'ens indvendige dele kan repareres af brugeren.



ADVARSEL!

- Denne UPS indeholder sin egen energikilde (batterier). Udgangsstikkene kan endog være strømførende, når UPS'en ikke er koblet til en vekselstrømsforsyning.
- Udgangsstikkene kan endog være spændingsførende i Standby- eller REPO-modus. Med f.eks. fase-til-fase indgangsledningsføring (208V fase-til-fase, énfas) er spændingen i udgangsstikkene 110–120V (målt fra nulpunkt-til-jord).
- Netledningen må ikke fjernes og stikket må ikke trækkes ud, mens UPS'en er tændt. Dette fjerner sikkerhedsjorden fra UPS'en og fra det udstyr, der er sat til.
- Installér denne UPS i et temperatur- og fugtighedskontrolleret indendørsmiljø, frit for ledende forureningsstoffer for at formindske risikoen for brand og elektrisk stød. Rumtemperaturen må ikke overstige 40°C. UPS'en bør ikke betjenes nær vand eller høj fugtighed (maksimalt 95%).

- På alle UPS-modeller skal overstrømsbeskyttelsen til indgangs og udgangs AC-kredsløbet/-ene leveres af andre. For at reducere risikoen for brand må tilslutning kun ske til et kredsløb med overstrømsbeskyttelse til afgreningskredsløb med en kapacitet på 60 ampere (10 kVA-modeller) eller 50 ampere (7,5 kVA-modeller) i overensstemmelse med National Electrical Code, ANSI/NFPA 70.
- På alle UPS-modeller skal skilleafbrydere med passende mærkedata til udgangs AC-kredsløbet/-ene leveres af andre. For at reducere risikoen for brand må tilslutning kun ske til et kredsløb med overstrømsbeskyttelse til afgreningskredsløb med en kapacitet på 50 ampere i overensstemmelse med National Electrical Code, ANSI/NFPA 70.



ADVARSEL

- Batterierne kan give risiko for elektrisk stød eller brandsår forårsaget af høj kortslutningsstrøm. Overhold gældende forsigtighedsregler. Servicering skal udføres af kvalificeret servicepersonale med kendskab til batterier og gældende forsigtighedsregler. Hold uautoriseret personale væk fra batterierne.
- Korrekt bortskaffelse af batterier er påkrævet. Overhold gældende lokale regler for bortskaffelsesprocedurer.
- Skaf dig aldrig af med batterierne ved at brænde dem. Batterierne kan eksplodere ved åben ild.

Belangrijke Veiligheidsinstructies

BELANGRIJKE VEILIGHEIDSINSTRUCTIES BEWAAR DEZE INSTRUCTIES

Deze handleiding bevat belangrijke instructies die u dient te volgen tijdens de installatie en het onderhoud van de UPS en de accu's. Lees alle instructies voordat u de apparatuur in bedrijf neemt en bewaar deze handleiding als naslagwerk.



GEVAAR

Deze UPS bevat LEVENSGEVAARLIJKE ELEKTRISCHE SPANNING. Alle reparaties en onderhoud dienen UITSLUITEND DOOR ERKEND SERVICEPERSONEEL te worden uitgevoerd. Er bevinden zich GEEN ONDERDELEN in de UPS die DOOR DE GEBRUIKER kunnen worden GEREPAREERD.



WAARSCHUWING

- Deze UPS bevat een eigen energiebron (batterijen). De uitgangcontactdoos kan onder spanning staan, zelfs wanneer de UPS niet is aangesloten op de netspanning.
- Zelfs in de modus Standby of REPO kunnen de uitgangsaansluitingen onder spanning staan. Bij lijn-naar-lijn bekabeling (208V lijn-naar-lijn, eenfase), bijvoorbeeld, bedraagt de spanning bij de uitgangsaansluitingen 110–120V (gemeten vanaf neutraal-naar-aarde).
- Verwijder de ingang snoer niet of haal de stekker van de ingang snoer er niet uit terwijl de UPS aan staat. Hierdoor zou de UPS en uw aangesloten apparatuur geen aardebeveiliging meer hebben.
- Teneinde de kans op brand of elektrische schok te verminderen dient deze UPS in een gebouw met temperatuur- en vochtigheidsregeling te worden geïnstalleerd, waar geen geleidende verontreinigingen aanwezig zijn. De omgevingstemperatuur mag 40°C niet overschrijden. Niet gebruiken in de buurt van water of bij zeer hoge vochtigheid (max. 95%).
- Voor alle UPS-modellen dient de overstroombeveiliging voor de in- en uitgangswisselstroomkringen door anderen te worden verzorgd. Om brandgevaar te verminderen dient u dit apparaat alleen aan te sluiten op een stroomkring met overstroombeveiliging op het aftakcircuit voor 60 ampère (10 kVA-modellen) of 50 ampère (7,5 kVA-modellen) in overeenstemming met de Amerikaanse National Electrical Code, ANSI/NFPA 70.
- Voor alle UPS-modellen dienen toepasselijk geclassificeerde stroomonderbrekers voor de in- en uitgangswisselstroomkringen door anderen te worden verzorgd. Om brandgevaar te verminderen dient u dit apparaat alleen aan te sluiten op een stroomkring met overstroombeveiliging op het aftakcircuit voor 50 ampère in overeenstemming met de Amerikaanse National Electrical Code, ANSI/NFPA 70.



OPGELET

- Batterijen leveren gevaar op voor elektrische schokken en kunnen brandwonden veroorzaken door een grote kortsluitstroom. Neem de juiste voorzorgsmaatregelen in acht. Het onderhoud moet worden uitgevoerd door bevoegde onderhoudsmonteurs die verstand hebben van accu's en op de hoogte zijn van de vereiste voorzorgsmaatregelen. Houd onbevoegden uit de buurt van de accu's.
- De batterijen moeten op de juiste wijze worden opgeruimd. Raadpleeg hiervoor uw plaatselijke voorschriften.
- Nooit batterijen in het vuur gooien. De batterijen kunnen ontploffen.

Tarkeita Turvaohjeita

TÄRKEITÄ TURVAOHJEITA - SUOMI SÄILYTÄ NÄMÄ OHJEET

Tämä käyttöohje sisältää tärkeitä ohjeita, joita on noudatettava UPS-virtalähteen ja akkujen asennuksen ja huollon yhteydessä. Lue kaikki ohjeet ennen laitteiston käyttöä ja säilytä ohje myöhempää tarvetta varten.



VAARA

Tämä UPS sisältää HENGENVAARALLISIA JÄNNITTEITÄ. Kaikki korjaukset ja huollot on jätettävä VAIN VALTUUTETUN HUOLTOHENKILÖN TOIMEKSI. UPS ei sisällä MITÄÄN KÄYTTÄJÄN HUOLLETTAVIA OSIA.



VAROITUS

- Tässä UPS-virtalähteessä on oma energianlähde (akut). Lähtövastakkeissa voi olla jännite, vaikka UPS-virtalähdettä ei ole kytketty verkkovirtaan.
- Lähtöliittimissä voi olla jännitteitä myös valmius- ja REPO-tilassa. Esimerkiksi linja-linjaan-tulokytkenässä (208 V linja-linjaan, yksivaiheinen) jännite tuloliittimissä on 110–120 V (mitattu neutraalista maattoon).
- Älä poista tai irrota sisääntulojohtoa, kun UPS on kytkettynä. Tämä poistaa turvamaadoituksen UPS-laitteesta ja siihen liitetystä laitteistosta.
- Vähentääksesi tulipalon ja sähköiskun vaaraa asenna tämä UPS sisätiloihin, joissa lämpötila ja kosteus on säädettävissä ja joissa ei ole virtaa johtavia epäpuhtauksia. Ympäristön lämpötila ei saa ylittää 40 °C. Älä käytä lähellä vettä ja vältä kosteita tiloja (95 % maksimi).

- Kaikissa UPS-malleissa muiden on toimitettava tulo- ja lähtö-AC-piirin/-piirien ylivirtasuoja. Tulipaloriskin pienentämiseksi kytke vain virtapiiriin, jossa on oman virtapiirin ylivirtasuoja, jonka luokitus on 60 ampeeria (10 kVA -mallit) tai 50 ampeeria (7,5 kVA -mallit) kansallisten sähkösäätöjen ANSI/NFPA 70:n mukaan.
- Kaikissa UPS-malleissa muiden on toimitettava luokituksestaan sopivat virrankatkaisukytkimet lähtö-AC-piiriin/-piireihin. Tulipaloriskin pienentämiseksi kytke vain virtapiiriin, jossa on oman virtapiirin ylivirtasuoja, jonka luokitus on 50 ampeeria kansallisten sähkösäätöjen ANSI/NFPA 70:n mukaan.
- Suuri vuotovirta. Maadoitus on tehtävä ennen kuin virransyöttö kytketään.



VARO

- Sähköiskuvaara. Akkupiiriä ei ole eristetty vaihtovirtatulosta. Akkunapojen ja maadoituksen välillä voi olla vaarallinen jännite. Testaa ennen koskettamista.
- Akut voivat aiheuttaa sähköiskun tai palovammojen vaaran johtuen suuresta oikosulkuvirrasta. Noudata kaikkia asianmukaisia varotoimia. Laitteen saa huoltaa vain ammattitaitoinen huoltohenkilökunta, joka tuntee akut ja niihin liittyvät varotoimet. Älä päästä valtuuttamatonta henkilöstöä lähelle akkuja.
- Akusto täytyy hävittää säädösten mukaisella tavalla. Noudata paikallisia määräyksiä.
- Älä koskaan heitä akkuja tuleen. Ne voivat räjähtää.

Consignes de sécurité

CONSIGNES DE SÉCURITÉ IMPORTANTES CONSERVER CES INSTRUCTIONS

Ce manuel comporte des instructions importantes que vous êtes invité à suivre lors de toute procédure d'installation et de maintenance des batteries et de l'onduleur. Veuillez consulter entièrement ces instructions avant de faire fonctionner l'équipement et conserver ce manuel afin de pouvoir vous y reporter ultérieurement.



DANGER!

Cet onduleur contient des TENSIONS MORTELLES. Toute opération d'entretien et de réparation doit être EXCLUSIVEMENT CONFIEE A UN PERSONNEL QUALIFIE AGRÉÉ. AUCUNE PIÈCE RÉPARABLE PAR L'UTILISATEUR ne se trouve dans l'onduleur.



AVERTISSEMENT!

- Cet onduleur possède sa propre source d'alimentation (batteries). Il est possible que les prises de sortie soient sous tension même lorsque l'onduleur n'est pas connectée à une alimentation CA.
- Les prises de sortie peuvent présenter des tensions de phase même en modes Attente ou REPO. Par exemple, avec un câblage d'entrée phase-phase (208 V phase-phase monophasé), la tension au niveau des prises de sortie est de 110–120 V (mesurée entre neutre et terre).
- Ne pas retirer le cordon d'alimentation lorsque l'onduleur est sous tension sous peine de supprimer la mise à la terre de l'onduleur et du matériel connecté.
- Pour réduire les risques d'incendie et de décharge électrique, installer l'onduleur uniquement à l'intérieur, dans un lieu dépourvu de matériaux conducteurs, où la température et l'humidité ambiantes sont contrôlées. La température ambiante ne doit pas dépasser 40 °C. Ne pas utiliser à proximité d'eau ou dans une atmosphère excessivement humide (95 % maximum).
- Pour tous les modèles d'onduleurs, la protection contre les surintensités pour les circuits d'entrée et de sortie c.a. doit être assurée par les autres circuits. Pour réduire le risque d'incendie, connectez le uniquement à un réseau possédant une protection 60 ampères (modèles 10 kVA) ou 50 ampères (modèles 7,5 kVA) conformément au National Electrical Code, ANSI/NFPA 70.
- Pour tous les modèles d'onduleurs, des sectionneurs d'une capacité correcte pour le ou les circuits de sortie c.a. doivent être fournis par les autres circuits. Pour réduire le risque d'incendie, connectez le uniquement à un réseau possédant une protection 50 ampères conformément au National Electrical Code, ANSI/NFPA 70.
- Courant de fuite élevé. Le raccordement à la terre est essentiel avant de connecter l'alimentation.



ATTENTION!

- Risque de décharge électrique. Le circuit de la batterie n'est pas isolé de l'entrée en CA. Des tensions dangereuses peuvent exister entre les bornes de la batterie et la terre. Testez-la batterie avant de la toucher.
- Les batteries peuvent présenter un risque de choc électrique ou de brûlure provenant d'un courant de court-circuit haute intensité. Observez les précautions appropriées. L'entretien doit être réalisé par du personnel qualifié connaissant bien les batteries et les précautions nécessaires. N'autorisez aucun personnel non qualifié à manipuler les batteries.
- Une mise au rebut réglementaire des batteries est obligatoire. Consulter les règlements en vigueur dans votre localité.
- Ne jamais jeter les batteries au feu. L'exposition aux flammes risque de les faire exploser.

Sicherheitswarnungen

WICHTIGE SICHERHEITSANWEISUNGEN AUFBEWAREN

Dieses Handbuch enthält wichtige Anweisungen, die Sie während der Installation und Wartung des USV (Unterbrechungsfreies Stromversorgungssystem) und der Batterien befolgen müssen. Bitte lesen Sie alle Anweisungen des Handbuches bevor Sie mit dem Gerät arbeiten. Bewahren Sie das Handbuch zum Nachlesen auf.



WARNUNG

Die USV führt lebensgefährliche Spannungen. Alle Reparatur- und Wartungsarbeiten sollten nur von Kundendienstfachleuten durchgeführt werden. Die USV enthält keine vom Benutzer zu wartenden Komponenten.



ACHTUNG

- Diese USV (Unterbrechungsfreies Stromversorgung) enthält eine eigene Energiequelle (Batterien). Die Ausgangssteckdosen können Spannung führen, auch wenn die USV nicht an eine Wechselstromquelle angeschlossen ist.
- Die Ausgangssteckdosen stehen unter Umständen unter Spannung, selbst im Bereitschafts- oder Fern-Not-Aus-(REPO)-Betrieb. Zum Beispiel beträgt bei einer Verkabelung mit Außenleitern (208 V einphasige Verkabelung) die Spannung an den Ausgangssteckdosen 110–120 Volt (gemessen an der Nullleitererdung).
- Das Eingangskabel nicht entfernen oder abziehen, während die USV eingeschaltet ist, weil hierdurch die Sicherheitserdung von der USV und den daran angeschlossenen Geräten entfernt wird.
- Um die Brand- oder Elektroschockgefahr zu verringern, diese USV nur in Gebäuden mit kontrollierter Temperatur und Luftfeuchtigkeit installieren, in denen keine leitenden Schmutzstoffe vorhanden sind. Die Umgebungstemperatur darf 40°C nicht übersteigen. Die USV nicht in der Nähe von Wasser oder in extrem hoher Luftfeuchtigkeit (max. 95 %) betreiben.
- Bei allen USV-Modellen muss der Überstromschutz für den (die) Eingangs- und Ausgangswechselstromkreis(e) anderweitig gewährleistet werden. Um die Brandgefahr zu verringern, nur an eine Leitung anschließen, die mit einem Überlaststromschutz von 60 Ampere (10 kVA-Modelle) oder 50 Ampere (7,5 kVA-Modelle) in Übereinstimmung mit dem National Electrical Code, ANSI/NFPA 70 ausgestattet ist.

- Bei allen USV-Modellen müssen geeignete Trennschalter für den (die) Ausgangswechselstromkreis(e) anderweitig bereitgestellt werden. Um die Brandgefahr zu verringern, nur an eine Leitung anschließen, die mit einem Überlaststromschutz von 50 Ampere in Übereinstimmung mit dem National Electrical Code, ANSI/NFPA 70 ausgestattet ist.
 - Hoher Leckstrom. Vor Anschluss der Versorgungsleitungen ist eine Erdung erforderlich.
-

**VORSICHT!**

- Gefahr eines elektrischen Schlags! Der Batteriestromkreis ist zum AC-Eingang nicht isoliert. Gefährliche Spannungen können zwischen den Batterieklemmen und Masse vorhanden sein. Vor dem Anfassen prüfen.
 - Batterien können das Risiko eines elektrischen Schlags bergen oder durch hohen Kurzschlussstrom in Brand geraten. Die richtigen Vorsichtsmaßnahmen beachten. Wartungsarbeiten müssen von qualifizierten Kundendienstfachleuten durchgeführt werden, die Kenntnisse über Akkus besitzen und die erforderlichen Vorsichtsmaßnahmen beachten. Unberechtigtes Personal von den Akkus fern halten.
 - Ordnungsgemäße Entsorgung der Akkus ist erforderlich. Lesen Sie hierfür Ihre örtlichen Entsorgungsbestimmungen.
 - Die Akkus nicht in einem Feuer entsorgen. In Feuer können Akkus explodieren.
-

Avvisi di sicurezza

IMPORTANTI ISTRUZIONI DI SICUREZZA CONSERVARE QUESTE ISTRUZIONI

Il presente manuale contiene importanti istruzioni da seguire durante l'installazione e la manutenzione dell'UPS e delle batterie. Leggere integralmente le istruzioni prima di utilizzare l'apparecchiatura e conservare il presente manuale per futuro riferimento.

PERICOLO



La TENSIONE contenuta in questo gruppo statico di continuità è LETALE. Tutte le operazioni di riparazione e di manutenzione devono essere effettuate **ESCLUSIVAMENTE DA PERSONALE TECNICO AUTORIZZATO**. All'interno del gruppo statico di continuità **NON** vi sono PARTI RIPARABILI DALL'UTENTE.

AVVERTENZA



- L'UPS contiene la propria fonte di energia (batterie). Le prese d'uscita possono essere sotto tensione anche quando l'UPS non è collegato all'alimentazione elettrica CA.
- Le prese d'uscita possono essere sotto tensione anche nelle modalità Standby o REPO. Per esempio, con un cablaggio in entrata del tipo linea-linea (linea-linea 208V, monofase), la tensione sulle prese d'uscita è 110–120V (con misurazione effettuata dal neutro alla terra).
- Non rimuovere nè scollegare il cavo di ingresso quando il gruppo statico di continuità è acceso poichè in tal modo si disattiverebbe il collegamento a terra di sicurezza del gruppo statico di continuità e dell'apparecchiatura ad esso collegata.
- Per ridurre il rischio di incendio o di scossa elettrica, installare il gruppo statico di continuità in un ambiente interno a temperatura ed umidità controllata, privo di agenti contaminanti conduttivi. La temperatura ambiente non deve superare i 40°C. Non utilizzare l'unità in prossimità di acqua o in presenza di umidità eccessiva (95% max).
- Per tutti i modelli UPS, occorre predisporre la protezione da sovracorrenti per i circuiti c.a. di ingresso e uscita. Per ridurre il rischio di incendio, effettuare il collegamento soltanto a un circuito dotato di una protezione da sovraccarico per il circuito derivato per 60 A (per i modelli da 10 kVA) o 50 A (per i modelli da 7,5 kVA), come stabilito dalle norme statunitensi sugli impianti elettrici (National Electrical Code) ANSI/NFPA 70.

- Per tutti i modelli UPS, occorre predisporre dei sezionatori adeguatamente tarati per il/i circuito/i c.a. di uscita. Per ridurre il rischio di incendio, effettuare il collegamento soltanto a un circuito dotato di una protezione da sovraccarico per il circuito derivato per 50 A, come stabilito dalle norme statunitensi sugli impianti elettrici (National Electrical Code) ANSI/NFPA 70.
 - Elevata corrente di dispersione. Eseguire assolutamente la messa a terra prima di allacciare l'alimentazione.
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ATTENZIONE

- Rischio di scossa elettrica. Il circuito della batteria non è isolato dall'ingresso AC. Tra terminali della batteria e terra possono esistere tensioni pericolose. Controllare, prima di toccare queste parti.
 - Le batterie possono comportare un rischio di scossa elettrica o di ustione in seguito a un'elevata corrente di corto circuito. Osservare le dovute precauzioni. L'assistenza deve essere eseguita da personale qualificato esperto di batterie e delle necessarie precauzioni. Tenere il personale non autorizzato lontano dalle batterie.
 - Le batterie devono essere smaltite in modo corretto. Per i requisiti di smaltimento fare riferimento alle disposizioni locali.
 - Non gettare mai le batterie nel fuoco poichè potrebbero esplodere se esposte alle fiamme.
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Viktig Sikkerhetsinformasjon**VIKTIGE SIKKERHETSINSTRUKSJONER
GJEM DISSE INSTRUKSJONENE**

Denne håndboken inneholder viktige instruksjoner som du bør overholde ved montering og vedlikehold av UPS-enheten og batteriene. Les alle instruksjoner før utstyret tas i bruk, og gjem håndboken til fremtidig referanse.

**FARLIG**

Denne UPS'en inneholder LIVSFARLIGE SPENNINGER. All reparasjon og service må kun utføres av AUTORISERT SERVICEPERSONALE. BRUKERE KAN IKKE UTFØRE SERVICE PÅ NOEN AV DELENE i UPS'en.

**FARLIG**

- UPS-enheten inneholder sin egen energikilde (batterier). Utgangsstikkene kan være strømførende selv når UPS-enheten ikke er koblet til et strømuttak.
- Strømuttakene kan være spenningsførende selv i Standby- eller REPO-modus. Med f.eks. fase-til-fase inngangsledningsføring (208V fase-til-fase, enfaset) er spenningen ved strømuttakene 110–120V (målt fra nøytral-til-jord).
- Strømforsyningskabelen må ikke fjernes eller trekkes ut når UPS'en er på, slik at ikke sikkerhetsjordingen fjernes fra UPS'en og det utstyret som er forbundet med den.
- For å redusere fare for brann eller elektriske støt, bør denne UPS'en installeres i et innendørs miljø med kontrollert temperatur og luftfuktighet som er fritt for ledende, forurensende stoffer. Romtemperaturen må ikke overskride 40°C. Den må ikke brukes i nærheten av vann eller ved meget høy luftfuktighet (95% maks.).
- For alle UPS-modeller skal overstrømsbeskyttelsen for inngangs- og utgangsvekselstrømskretsløpet(-ene) leveres av andre. For å redusere brannfaren skal det bare tilkobles en krets med overstrømsbeskyttelse for 60 ampere (10 kVA modeller) eller 50 ampere (7.5 kVA modeller) klassifisering i henhold til National Electrical Code, ANSI/NFPA 70.
- For alle UPS-modeller skal passende utkoblingsbrytere for utgangsvekselstrømskretsløpet(-ene) leveres av andre. For å redusere brannfaren skal det bare tilkobles en krets med overstrømsbeskyttelse for 60 ampere (10 kVA modeller) eller 50 ampere (7.5 kVA modeller) klassifisering i henhold til National Electrical Code, ANSI/NFPA 70.



FORSIKTIG

- Batterier kan utgjøre en fare for elektrisk støt eller brannskår pga. høy kortslutningsstrøm. Treff passende forholdsregler. Service bør utføres av kvalifisert servicepersonale med kjennskap til batterier og nødvendige forholdsregler. Hold uautorisert personale borte fra batteriene.
- Batterier må fjernes på korrekt måte. Se lokale forskrifter vedrørende krav om fjerning av batterier.
- Kast aldri batterier i flammer, da de kan eksplodere, hvis de utsettes for åpen ild.

Ostrzeżenia dotyczące bezpieczeństwa

WAŻNE INSTRUKCJE DOTYCZĄCE BEZPIECZEŃSTWA NALEŻY ZACHOWAĆ TE INSTRUKCJE

Niniejsza dokumentacja zawiera ważne instrukcje, których należy przestrzegać podczas instalacji i konserwacji zasilacza UPS oraz akumulatorów. Przed przystąpieniem do użytkowania urządzeń należy zapoznać się ze wszystkimi instrukcjami i zachować niniejszą dokumentację na przyszłość.



NIEBEZPIECZEŃSTWO

Wewnątrz tego urządzenia UPS obecne są **NAPIĘCIA POWODUJĄCE ŚMIERĆ**. Wszelkie naprawy i czynności serwisowe powinni wykonywać wyłącznie **PRACOWNICY AUTORYZOWANEGO SERWISU**. Wewnątrz urządzenia UPS **NIE MA CZĘŚCI PRZEZNACZONYCH DO SAMODZIELNEJ OBSŁUGI SERWISOWEJ**.



PRZESTROGA

- Ten zasilacz UPS zawiera własne źródło energii (akumulatory). Na gniazdach wyjściowych może być obecne napięcie nawet wtedy, gdy zasilacz UPS nie jest podłączony do źródła prądu przemiennego.
- Gniazda wyjściowe mogą znajdować się pod napięciem nawet w trybie gotowości lub po wyłączeniu wyłącznikiem REPO. Na przykład w przypadku napięcia wejściowego międzyprzewodowego 208 V (obwód jednofazowy) napięcie na gniazdach wyjściowych wynosi 110–120 V (mierzone między zerem a uziemieniem).
- Nie należy demontować ani odłączać przewodu wejściowego, gdy zasilacz UPS jest włączony. Spowoduje to odłączenie uziemienia ochronnego od zasilacza UPS i podłączonych do niego urządzeń.

- Aby ograniczyć ryzyko pożaru lub porażenia prądem elektrycznym, należy zainstalować to urządzenie UPS w pomieszczeniu, w którym utrzymywana jest kontrolowana wilgotność, i w którym nie występują zanieczyszczenia przewodzące prąd elektryczny. Temperatura otoczenia nie może przekraczać 40°C (104°F). Nie należy użytkować urządzenia w pobliżu wody lub w miejscach skrajnie wilgotnych (maks. 95%).
- We wszystkich modelach zasilaczy UPS zabezpieczenie nadprądowe obwodów wejściowego i wyjściowego prądu przemiennego musi być zapewnione przez użytkownika. W celu ograniczenia ryzyka zapłonu należy wykonywać połączenia wyłącznie do obwodu zaopatrzonego w zabezpieczenie nadprądowe o obciążalności 60 amperów (modele 10 kVA) lub 50 amperów (modele 7,5 kVA) i parametrach znamionowych zgodnych z amerykańskim Krajowym Kodeksem Elektrycznym (ang. National Electrical Code), ANSI/NFPA 70.
- W modelach zasilaczy UPS użytkownik musi zapewnić odłączniki obwodów AC o odpowiednim prądzie znamionowym. W celu ograniczenia ryzyka zapłonu należy wykonywać połączenia wyłącznie do obwodu zaopatrzonego w zabezpieczenie nadprądowe o obciążalności 50 amperów i parametrach znamionowych zgodnych z amerykańskim Krajowym Kodeksem Elektrycznym (ang. National Electrical Code), ANSI/NFPA 70.
- Wysoka wartość prądu upływu. Przed podłączeniem zasilania bardzo ważne jest podłączenie uziemienia.



OSTRZEŻENIE

- Istnieje ryzyko porażenia prądem elektrycznym. Obwód akumulatora nie jest odizolowany od obwodu wejściowego prądu przemiennego. Między zaciskami akumulatora i uziemieniem może występować niebezpieczne napięcie. Przed dotknięciem przewodów należy sprawdzić wartość napięcia.
- Akumulatory stwarzają potencjalne zagrożenie porażenia prądem lub poparzenia przez prąd zwarciový. Stosować odpowiednie środki ostrożności. Czynności serwisowe powinny wykonywać osoby wykwalifikowane zaznajomione z akumulatorami i środkami ostrożności. Osoby niepowołane nie powinny zbliżać się do akumulatorów.
- Akumulatory należy poddać prawidłowej utylizacji. Patrz przepisy lokalne dotyczące utylizacji.
- Nigdy nie wyrzucać akumulatorów do ognia. W kontakcie z płomieniem akumulatory mogą eksplodować.

Regulamentos de Segurança

INSTRUÇÕES DE SEGURANÇA IMPORTANTES GUARDE ESTAS INSTRUÇÕES

Este manual contém instruções importantes que devem ser seguidas durante a instalação e manutenção do no-break e das baterias. Leia todas as instruções antes de operar o equipamento e guarde este manual para consultá-lo futuramente.

CUIDADO



A UPS contém VOLTAGEM MORTAL. Todos os reparos e assistência técnica devem ser executados SOMENTE POR PESSOAL DA ASSISTÊNCIA TÉCNICA AUTORIZADO. Não há nenhuma PEÇA QUE POSSA SER REPARADA PELO USUÁRIO dentro da UPS.

ADVERTÊNCIA



- Este no-break possui sua própria fonte de energia (baterias). As tomadas de saída podem estar energizadas mesmo que o no-break não esteja conectado a uma fonte de energia elétrica.
- Os receptáculos de saída podem ter voltagens altas mesmo em modo de Espera ou REPO. Por exemplo, com o cabeamento de entrada linha a linha (208V, monofásico), a voltagem nos receptáculos de saída é de 110–120V (medição entre neutro e terra).
- Não remova ou desconecte o cabo de entrada quando a UPS estiver ligada. Isto removerá o aterramento de segurança da UPS e do equipamento conectado.
- Para reduzir o risco de incêndios ou choques elétricos, instale a UPS em ambiente interno com temperatura e umidade controladas e livres de contaminadores condutíveis. A temperatura ambiente não deve exceder 40°C. Não opere próximo a água ou em umidade excessiva (máx: 95%).
- Para todos os modelos UPS, a proteção contra sobrecorrente para os circuitos de entrada e saída CA será fornecida por terceiros. Para reduzir o risco de incêndios, conecte apenas a um circuito equipado com proteção contra sobrecorrente de circuito de derivação para 60 amperes (modelos de 10 kVA) ou 50 amperes (modelos de 7,5 kVA) de acordo com o National Electrical Code, ANSI/NFPA 70.
- Para todos os modelos UPS, os disjuntores adequados para os circuitos de saída de CA serão fornecidos por terceiros. Para reduzir o risco de incêndios, conecte apenas a um circuito equipado com a proteção contra sobrecorrente de circuito de derivação para 50 amperes de acordo com o National Electrical Code, ANSI/NFPA 70.



PERIGO

- As baterias podem oferecer risco de choque elétrico ou queimadura, ocasionados por alta tensão com possibilidade de curto-circuito. Tome as precauções adequadas. A manutenção deve ser realizada por pessoal qualificado, com conhecimento sobre baterias e ciente das precauções exigidas. Mantenha o pessoal não autorizado afastado das baterias.
- Siga as instruções apropriadas ao desfazer-se das baterias. Consulte os códigos do local para maiores informações sobre os regulamentos de descarte de produtos.
- Nunca jogue as baterias no fogo, porque há risco de explosão.

Предупреждения по мерам безопасности

ВАЖНЫЕ УКАЗАНИЯ ПО МЕРАМ БЕЗОПАСНОСТИ СОХРАНИТЕ ЭТИ УКАЗАНИЯ

В данном руководстве содержатся важные инструкции по установке и обслуживанию источника бесперебойного питания (ИБП) и батарей. Перед работой с оборудованием прочтите все инструкции. Сохраните данное руководство для дальнейшего использования.



ОПАСНО

В данном ИБП имеются **СМЕРТЕЛЬНО ОПАСНЫЕ НАПРЯЖЕНИЯ**. Все работы по ремонту и обслуживанию должны выполняться **ТОЛЬКО УПОЛНОМОЧЕННЫМ ОБСЛУЖИВАЮЩИМ ПЕРСОНАЛОМ**. Внутри ИБП нет узлов, **ОБСЛУЖИВАЕМЫХ ПОЛЬЗОВАТЕЛЕМ**.



ПРЕДУПРЕЖДЕНИЕ

- В данном ИБП установлены собственные источники энергии (батарей). На выходных розетках может быть напряжение, даже если ИБП не подключен к сети переменного тока.
- Выходные розетки могут находиться под напряжением даже в режиме ожидания или REPO.
- Не отсоединяйте сетевой шнур и не извлекайте его вилку из розетки при включенном ИБП. При этом защитное заземление отключается от ИБП и от оборудования, подключенного к ИПБ.
- Для снижения опасности пожара или поражения электрическим током устанавливайте ИБП в закрытом помещении с контролируемыми температурой и влажностью, в котором отсутствуют проводящие загрязняющие вещества. Температура окружающего воздуха не должна превышать 40°C. Не эксплуатируйте устройство около воды или в местах с повышенной влажностью (макс. 95%).

- Для всех моделей ИБП необходимо обеспечить защиту от тока перегрузки для выхода цепей переменного тока. Для снижения риска возгорания при подключении используйте только электрическую цепь, снабженную защитой от перегрузки на 60 ампер (модели 10 кВА) или 50 ампер (модели 7,5 кВА) в соответствии с Национальными электротехническими правилами и нормами ANSI/NFPA 70.
- Для всех моделей ИБП необходимы выключатели для выходов цепей переменного тока, рассчитанные на нагрузку. Для снижения риска возгорания при подключении используйте только электрическую цепь, снабженную защитой от перегрузки на 50 ампер в соответствии с Национальными электротехническими правилами и нормами ANSI/NFPA 70.
- Повышенная утечка тока. Перед подсоединением источника питания обязательно подключите контакт заземления.



ОСТОРОЖНО

- Опасность поражения электротоком. Цепь батарей не изолирована от источника переменного тока. Между контактами батарей и землей может существовать опасное напряжение. Перед тем как прикасаться к контактам, проверьте напряжение.
- Высокое напряжение, вызванное коротким замыканием в батарее, может привести к поражению электрическим током или ожогу. Соблюдайте меры предосторожности. Техническое обслуживание должно осуществляться квалифицированным персоналом по работе с источниками питания, знакомым с мерами предосторожности. Не допускайте к работе с батареями посторонних.
- Необходимо соблюдать правила утилизации аккумуляторных батарей. Обратитесь к местным нормативным актам за информацией о требованиях к утилизации.
- Никогда не бросайте батареи в огонь. Батареи могут взорваться под воздействием огня.

Advertencias de Seguridad

INSTRUCCIONES DE SEGURIDAD IMPORTANTES GUARDE ESTAS INSTRUCCIONES

Este manual contiene instrucciones importantes que debe seguir durante la instalación y el mantenimiento del SAI y de las baterías. Por favor, lea todas las instrucciones antes de poner en funcionamiento el equipo y guarde este manual para referencia en el futuro.



PELIGRO

Este SAI contiene VOLTAJES MORTALES. Todas las reparaciones y el servicio técnico deben ser efectuados **SOLAMENTE POR PERSONAL DE SERVICIO TÉCNICO AUTORIZADO**. No hay **NINGUNA PARTE QUE EL USUARIO PUEDA REPARAR** dentro del SAI.



ADVERTENCIA

- Este SAI contiene su propia fuente de energía (baterías). Los receptáculos de salida pueden transportar voltaje activo aun cuando el SAI no esté conectado con una fuente de CA.
- Es posible que los receptáculos de salida tengan voltajes activos aún en modo Standby (de espera) o REPO. Por ejemplo, con el cableado de entrada de línea a línea (208V línea a línea, monofásico), el voltaje en los receptáculos de salida es de 110–120V (medido de neutro a tierra).
- No retire o desenchufe el cable de entrada mientras el SAI se encuentre encendido. Esto suprime la descarga a tierra de seguridad del SAI y de los equipos conectados al SAI.
- Para reducir el riesgo de incendio o de choque eléctrico, instale este SAI en un lugar cubierto, con temperatura y humedad controladas, libre de contaminantes conductores. La temperatura ambiente no debe exceder los 40°C. No trabaje cerca del agua o con humedad excesiva (95% máximo).
- Para todos los modelos de SAI, la protección contra sobrecargas de corriente para el(los) circuito(s) de entrada y salida de CA debe suministrarse por parte de terceros. Para reducir el riesgo de incendio, realice la conexión únicamente con un circuito que se proporcione con protección contra sobrecargas de corriente de circuito de bifurcación para una especificación de 60 amperios (modelos 10 kVA) o 50 amperios (modelos 7.5 kVA) de acuerdo con el Código Eléctrico Nacional, ANSI/NFPA 70.

- Para todos los modelos de SAI, interruptores de desconexión especificados adecuadamente para el(los) circuito(s) de salida de CA deben ser suministrados por parte de terceros. Para reducir el riesgo de incendio, realice la conexión únicamente con un circuito que se proporcione con protección contra sobrecarga de corriente de circuito de bifurcación para una especificación de 50 amperios de acuerdo con el Código Eléctrico Nacional, ANSI/NFPA 70.
 - Alta corriente de fuga. La conexión a tierra es esencial antes de conectar la alimentación.
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PRECAUCIÓN

- Riesgo de descarga eléctrica. El circuito de la batería no se encuentra aislado desde la entrada de CA. Podrían existir voltajes peligrosos entre terminales de baterías y la conexión a tierra. Realice una prueba antes de hacer contacto.
 - Las baterías pueden constituir un riesgo de descarga eléctrica o quemaduras por corriente alta de corto circuito. Adopte las precauciones debidas. Personal calificado de servicio que conozca de baterías y esté al tanto de las precauciones requeridas debe darle servicio al equipo. Mantenga al personal no autorizado alejado de las baterías.
 - Es necesario desechar las baterías de un modo adecuado. Consulte las normas locales para conocer los requisitos pertinentes.
 - Nunca deseche las baterías en el fuego. Las baterías pueden explotar si se las expone a la llama.
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Säkerhetsföreskrifter

VIKTIGA SÄKERHETSFÖRESKRIFTER SPARA DESSA FÖRESKRIFTER

Den här anvisningen innehåller viktiga instruktioner som du ska följa under installation och underhåll av UPS-enheten och batterierna. Läs alla instruktioner innan du använder utrustningen och spara den här anvisningen för framtida referens.



FARA

Denna UPS-enhet innehåller LIVSFARLIG SPÄNNING. ENDAST AUKTORISERAD SERVICEPERSONAL får utföra reparationer eller service. Det finns inga delar som ANVÄNDAREN KAN UTFÖRA SERVICE PÅ inuti UPS-enheten.



VARNING

- Den här UPS-enheten innehåller sin egen energikälla (batterier). Uttagen kan vara spänningsförande även då UPS-enheten inte är ansluten till spänningsnätet.
- Uttagen kan vara spänningsförande även i vilo- eller REPO-läget. Med ingångskopplingen ledare-till-ledare (208 V ledare-till-ledare, enfase) är till exempel spänningen i uttagen 110–120 V (mätt från nolla till jord).
- Ta aldrig bort nätsladden när UPS-enheten är påslagen. Detta tar bort skyddsjordningen från både UPS-enheten och den anslutna utrustningen.
- Minska risken för brand eller elektriska stötar genom att installera denna UPS-enhet inomhus, där temperatur och luftfuktighet är kontrollerade och där inga ledande föroreningar förekommer. Omgivande temperatur får ej överstiga 40 °C. Använd inte utrustningen nära vatten eller vid hög luftfuktighet (max 95 %).
- För alla UPS-modeller gäller att överbelastningsskydd för de in- och utgående växelströmskretsarna skall levereras av andra. För att minska brandrisken skall enheten bara anslutas till en krets som skyddas med överbelastningsskydd på 60 ampere (10 kVA-modeller) eller 50 ampere (7,5 kVA-modeller) i enlighet med National Electrical Code, ANSI/NFPA 70.
- För alla UPS-modeller gäller att lämpligt klassade strömbrytare för de utgående växelströmskretsarna skall levereras av andra. För att minska brandrisken skall enheten bara anslutas till en krets som skyddas med ett överbelastningsskydd på 50 ampere i enlighet med National Electrical Code, ANSI/NFPA 70.
- Hög läckström. Enheten måste jordas före anslutning till strömkällan.

**VIKTIGT**

- Risk för elektrisk stöt. Batteriet är inte isolerat från ingående växelström. Det kan finnas farlig spänning mellan batteripolerna och jord. Testa innan du rör vid enheten.
 - Batterierna kan innebära en risk för elektrisk stöt eller brännskada från kortsluten starkström. Iakttag lämpliga försiktighetsåtgärder. Service ska utföras av utbildad servicepersonal med kunskap om batterierna och nödvändiga försiktighetsåtgärder. Håll ej behörig personal borta från batterierna.
 - Batterierna måste avyttras enligt anvisningarna i lokal lagstiftning.
 - Använda batterier får aldrig brännas upp. De kan explodera.
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Chapter 3 Installation

This section explains:

- Equipment inspection
- Unpacking the cabinet
- Extended Battery Module (EBM) setup and installation, including EBM batteries
- UPS setup and installation, including UPS internal batteries
- Remote emergency power-off (REPO) or remote on/off (ROO) installation

Inspecting the Equipment

If any equipment has been damaged during shipment, keep the shipping cartons and packing materials for the carrier or place of purchase and file a claim for shipping damage. If you discover damage after acceptance, file a claim for concealed damage.

To file a claim for shipping damage or concealed damage: 1) File with the carrier within 15 days of receipt of the equipment; 2) Send a copy of the damage claim within 15 days to your service representative.



NOTE Check the battery recharge date on the shipping carton label. If the date has expired and the batteries were never recharged, do not use the UPS. Contact your service representative.

Unpacking the Cabinet



CAUTION

- Unpacking the cabinet in a low-temperature environment may cause condensation to occur in and on the cabinet. Do not install the cabinet until the inside and outside of the cabinet are absolutely dry (hazard of electric shock).
- The UPS is heavy (see page 97). A minimum of two people are required to remove the UPS from its carton.

To unpack the cabinet and accessories:

1. Cut the pallet straps and remove the large cardboard outer sleeve. Have two people lift the sleeve for ease of removal.
2. The cabinet, batteries, and accessory kit are packaged in individual cartons. Do not install the batteries until after the cabinet is installed in the rack.

Use care when moving and opening the cartons. Leave the components packaged until ready to install.

3. Discard or recycle the packaging in a responsible manner, or store it for future use.

Follow these guidelines when locating the cabinet after unpacking:

- Place the cabinet in a protected area that has adequate airflow and is free of humidity, flammable gas, and corrosion.
- Avoid placing the cabinet on its side. Make sure the air vents on the front and rear of the cabinet are not blocked.
- The recommended configuration is to install the optional EBM(s) in the lower part of the rack, with the UPS directly above the EBM(s).

If installing optional EBM(s), continue to the following section, "EBM Setup." Otherwise, continue to "UPS Setup" on page 36.

EBM Setup

The Powerware 9140 EBM comes with all hardware required for installation in a standard EIA or JIS seismic rack-mount configuration with square or round mounting holes. The rail assemblies adjust to mount in 48-cm (19-inch) panel racks from 61 to 84 cm (24 to 33 inches) deep [72 to 81 cm (28.5 to 32 inches) deep if installing the optional seismic mounting brackets].

Checking the EBM Accessory Kit

If you purchased an optional EBM, verify that the following items are included with the EBM:

- Mounting brackets and fasteners (if not already installed):
 - (2) front mounting brackets
 - (2) rear mounting brackets
 - (12) M4 flat-head screws, plus (2) extra
- Rails and fasteners:
 - (2) sliding rail assemblies (left and right)
 - (4) adapter plates (for 7.1 mm round hole)
 - (4) adapter plates (for 9.5 mm square hole)
 - (16) M5 machine screws, plus (2) extra
 - (2) M6 machine screws, plus (2) extra
 - (2) M6 clip nuts for racks with round holes, plus (2) extra
 - (2) M6 cage nuts for racks with square holes, plus (2) extra
 - (8) M4 machine screws with (8) M4 locknuts, plus (2) extra of each
- EBM user's guide
- Optional seismic mounting brackets and fasteners:
 - (2) EBM seismic mounting brackets
 - (4) wing bolts, plus (1) extra
 - (4) M6 machine screws, plus (2) extra



NOTE Discard the EBM user's guide if you are installing the EBM with a new UPS at the same time. Use the UPS user's guide instead to install both the UPS and the EBM.

Rack Setup for the EBM



NOTE Mounting rails are required for each individual cabinet.

NOTE The recommended configuration is to install the EBM(s) in the lower part of the rack, with the UPS directly above the EBM(s).

To install the optional EBM rail kit:

1. Select the proper holes in the rack for positioning the EBM in the rack (see Figure 2).



NOTE The EBM takes up position 1 through position 9.

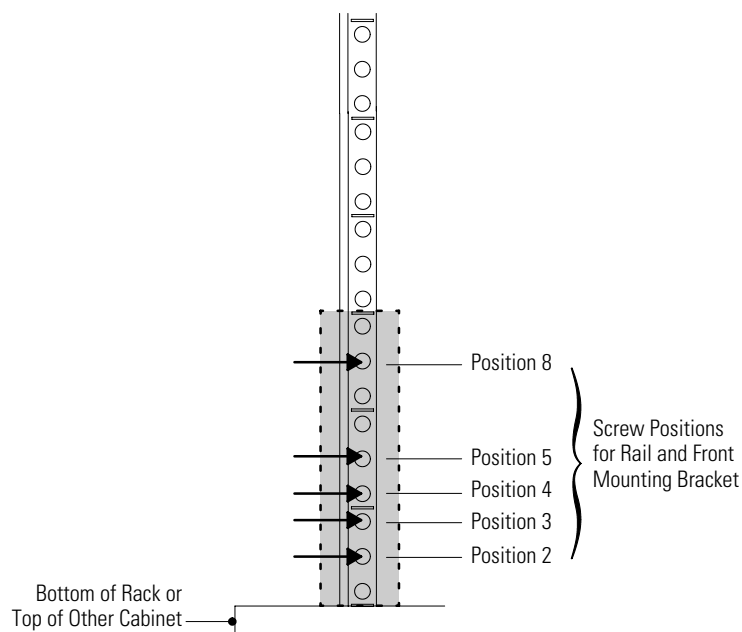


Figure 2. Front Rail Screw Positions for the EBM

2. If access to the sides of your rack is difficult, adjust the length of the rails (see Figure 4) and loosely install the fasteners (see Figure 6) before continuing to Step 3.

3. Using two M5 machine screws and an adapter plate, attach the rail to the front of the rack (see Figure 2 and Figure 3).

Do not tighten the screws.

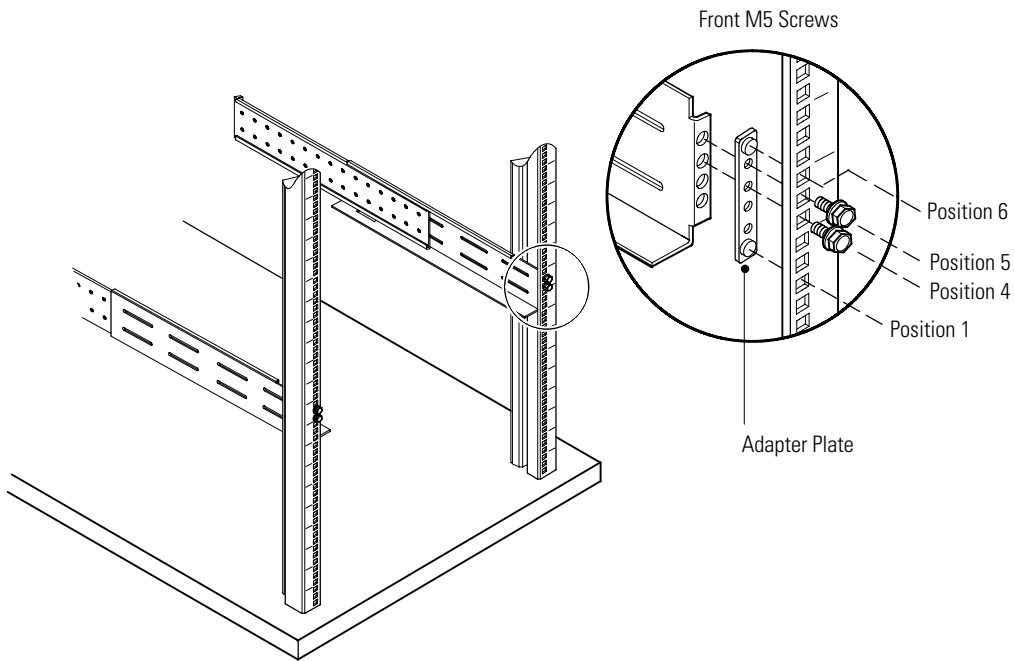


Figure 3. Securing the Front Rail

4. Adjust the rail size on the rail assembly for the depth of your rack (see Figure 4).

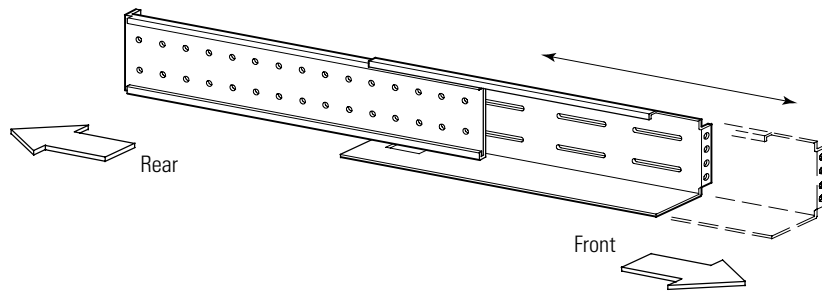


Figure 4. Adjusting the Rail Depth (Right Rail Assembly Shown)

5. Secure the rail to the rear of the rack with four M5 machine screws and an adapter plate (see Figure 5).

Tighten all screws at the front and rear of the rail.

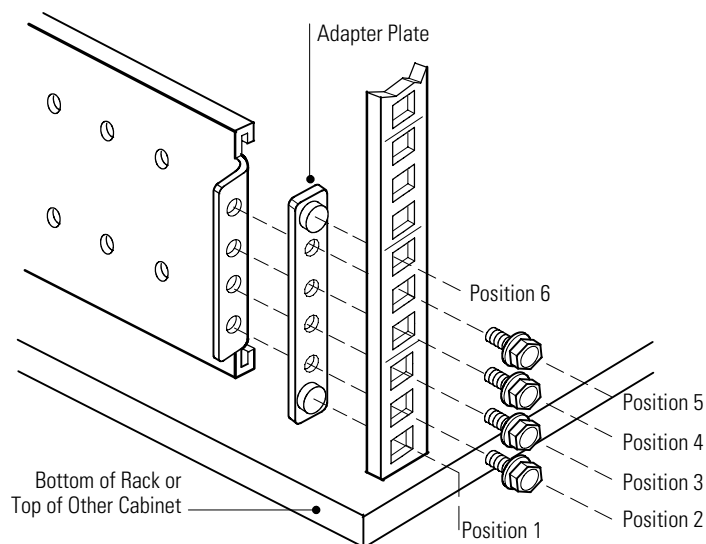


Figure 5. Securing the Rear Rail (Right Rail Assembly Shown)

6. Repeat Steps 3 through 5 for the other rail.
7. To tighten the rail adjustment, assemble four M4 machine screws and four M4 locknuts to the middle of the rail assembly. Tighten using a 7 mm (9/32") nut driver. See Figure 6.

Repeat for the other rail.

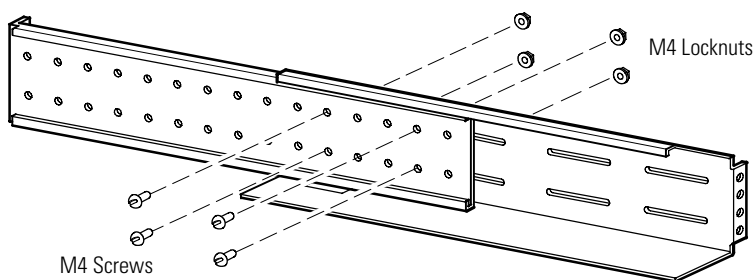


Figure 6. Tightening the Rail Adjustment (Right Rail Assembly Shown)

8. Place the EBM on a flat, stable surface with the front of the EBM facing toward you.
9. If the front and rear mounting brackets are already installed, skip to Step 12. If the brackets are not already installed, continue to Step 10.
10. Align the two front mounting brackets with the screw holes on the sides of the EBM and secure with eight supplied M4 flat-head screws (see Figure 7).
11. Align the two rear mounting brackets with the lowest two screw holes on the sides of the EBM and secure with four supplied M4 flat-head screws.

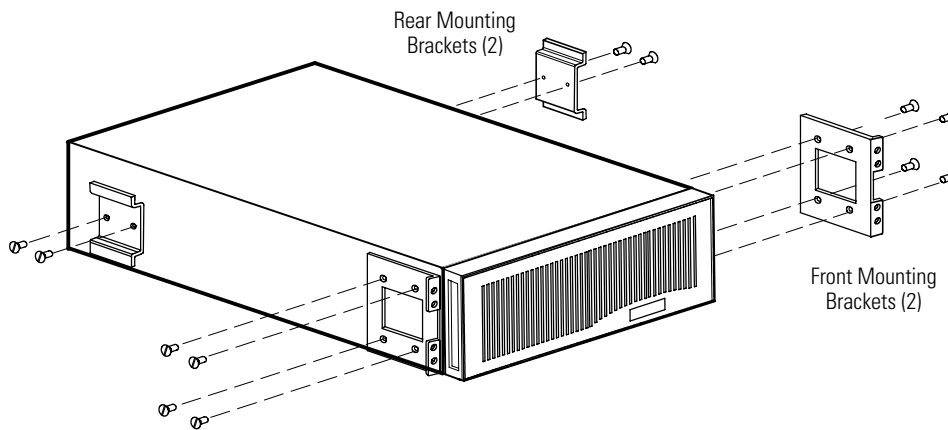


Figure 7. Installing the EBM Front and Rear Mounting Brackets

12. Install two cage or clip nuts as shown in Figure 8. If the rack holes are square, use two cage nuts. If the rack holes are round, use two clip nuts.
13. Slide the EBM into the rack. Verify that the rear mounting brackets engage in and slide easily along the inside of the rails.

14. Secure the front of the cabinet to the rack as shown in Figure 8.

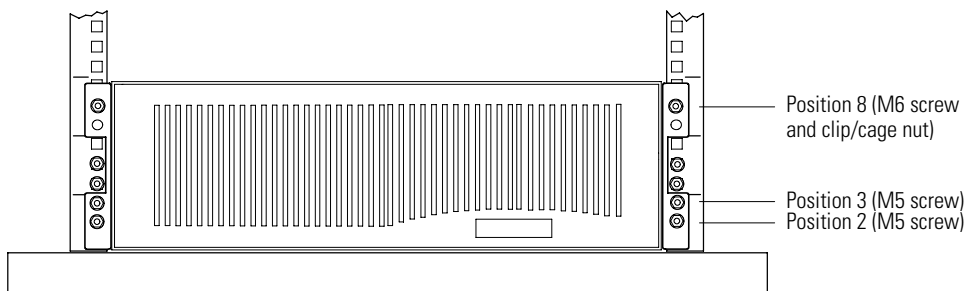


Figure 8. Securing the Front of the EBM



NOTE To install the optional seismic mounting brackets, the length of the rails must be between 28.5 and 32 inches.

15. If installing the optional seismic mounting brackets, align the two EBM seismic mounting brackets with the screw holes on the sides of the EBM above the rear mounting brackets. Loosely secure the brackets with four supplied wing bolts. See Figure 9.

Do not tighten the wing bolts.

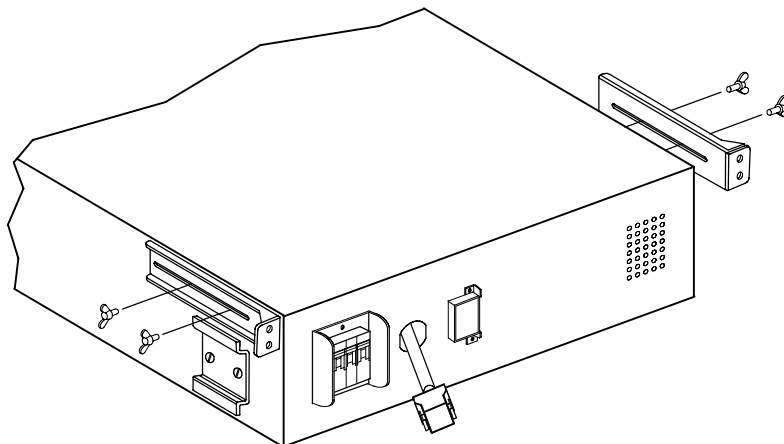


Figure 9. Installing the Optional EBM Seismic Mounting Brackets

16. If the optional seismic mounting brackets are installed, secure the brackets on the EBM to the rack using four M6 machine screws as shown in Figure 10.

Tighten the wing bolts on the seismic mounting brackets.

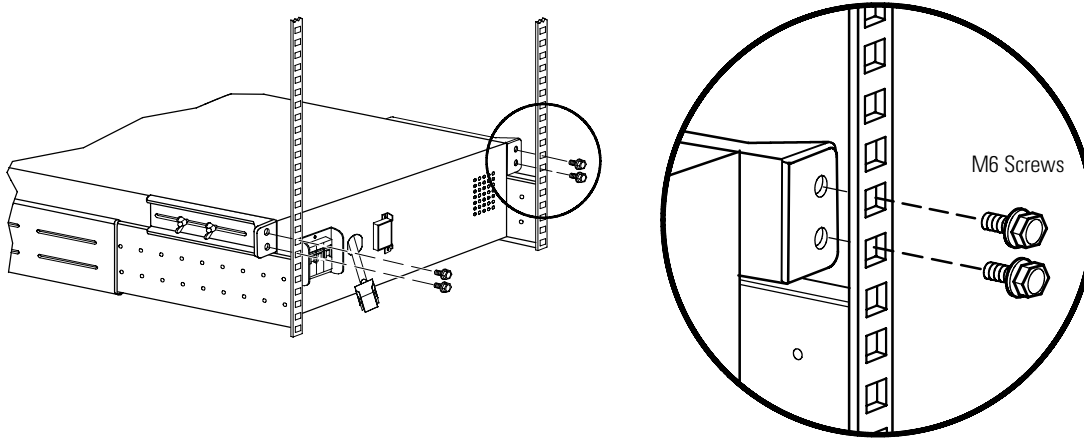


Figure 10. Securing the Optional EBM Seismic Mounting Brackets

Installing the EBM Batteries

To install the battery trays into the EBM cabinet:

1. Verify that the battery circuit breaker on the EBM rear panel is in the OFF (O) position (see Figure 26 on page 48).
2. Remove the EBM front cover (see Figure 11).

To remove the front cover, loosen the two front cover screws. Grasp the fingergrrips on both sides of the cover and pull the cover forward firmly.

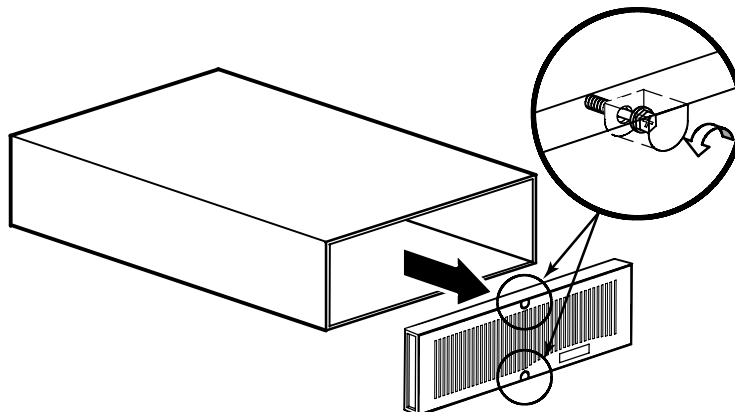


Figure 11. Removing the EBM Front Cover

3. Slide the battery trays into the cabinet (see Figure 12). Push each tray in until the battery tray lock on the handle catches to lock the tray in place.

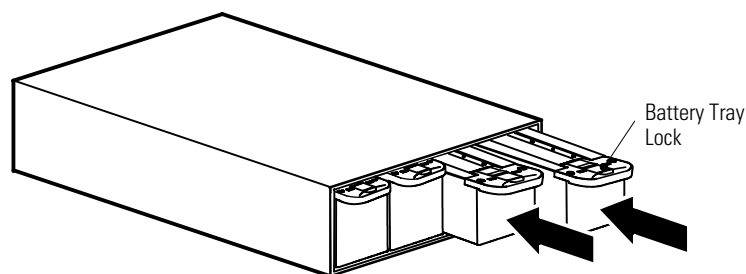


Figure 12. Installing the Battery Trays

4. Replace the EBM front cover and tighten the two front cover screws (see Figure 13).

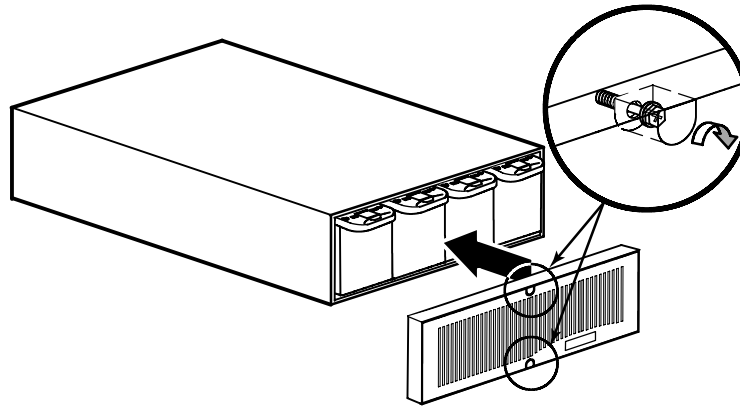


Figure 13. Replacing the EBM Front Cover

UPS Setup

The Powerware 9140 UPS comes with all hardware required for installation in a standard EIA or JIS seismic rack-mount configuration with square and round mounting holes. The rail assemblies adjust to mount in 48-cm (19-inch) panel racks from 61 to 84 cm (24 to 33 inches) deep [72 to 81 cm (28.5 to 32 inches) deep if installing the optional seismic mounting brackets].

Checking the UPS Accessory Kit

Verify that the following items are included with the UPS:

- Mounting brackets and fasteners (if not already installed):
 - (4) front mounting brackets
 - (2) rear mounting brackets
 - (20) M4 flat-head screws, plus (2) extra
- Rails and fasteners:
 - (2) sliding rail assemblies (left and right)
 - (4) adapter plates (7.1 mm round hole)
 - (4) adapter plates (9.5 mm square hole)
 - (16) M5 machine screws, plus (2) extra
 - (6) M6 machine screws, plus (4) extra
 - (6) M6 clip nuts for racks with round holes, plus (4) extra
 - (6) M6 cage nuts for racks with square holes, plus (4) extra
 - (8) M4 machine screws with (8) M4 locknuts, plus (2) extra of each
- Cables:
 - Serial cable
 - USB cable
- REPO connector
- Software Suite CD
- This user's guide
- Optional seismic mounting brackets and fasteners:
 - (2) UPS seismic mounting brackets
 - (8) wing bolts, plus (1) extra
 - (4) M6 machine screws, plus (2) extra

Rack Setup for the UPS



CAUTION The UPS is heavy (see page 97). A minimum of two people are required to remove the UPS from its carton.



NOTE Mounting rails are required for each individual cabinet.

NOTE The recommended configuration is to install the optional EBM(s) in the lower part of the rack, with the UPS directly above the EBM(s).

To install the UPS rail kit:

1. Select the proper holes in the rack for positioning the UPS in the rack (see Figure 14).



NOTE The UPS takes up position 1 through position 18.

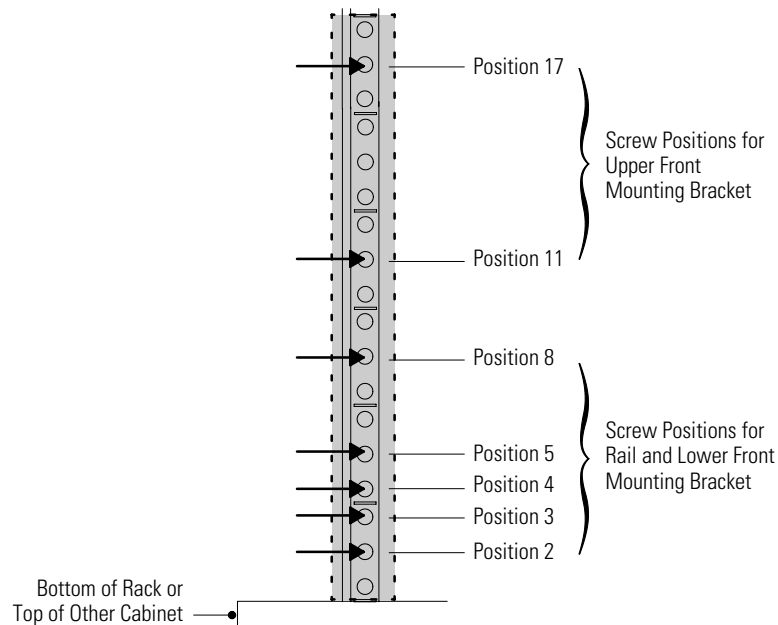


Figure 14. Front Rail Screw Positions for the UPS

2. If access to the sides of your rack is difficult, adjust the length of the rails (see Figure 16) and loosely install the fasteners (see Figure 18) before continuing to Step 3.
3. Using two M5 machine screws and an adapter plate, attach the rail to the front of the rack (see Figure 14 and Figure 15).

Do not tighten the screws.

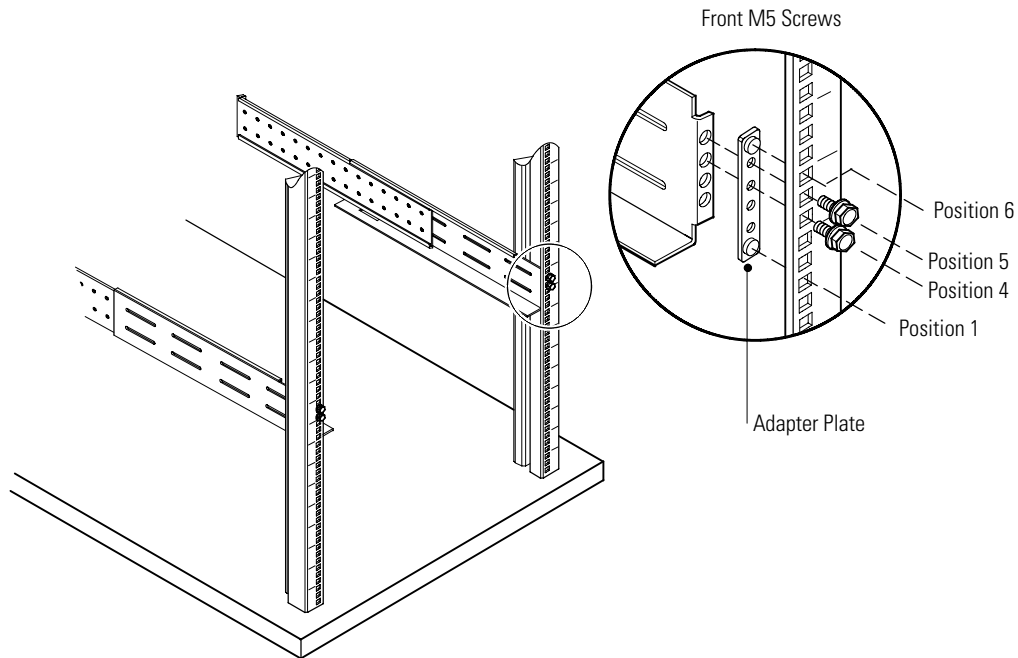


Figure 15. Securing the Front Rail

4. Adjust the rail size on the rail assembly for the depth of your rack (see Figure 16).

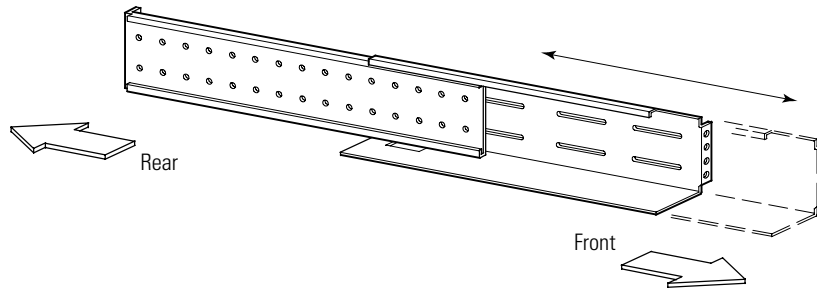


Figure 16. Adjusting the Rail Depth (Right Rail Assembly Shown)

5. Secure the rail to the rear of the rack with four M5 machine screws and an adapter plate (see Figure 17).

Tighten all screws at the front and rear of the rail.

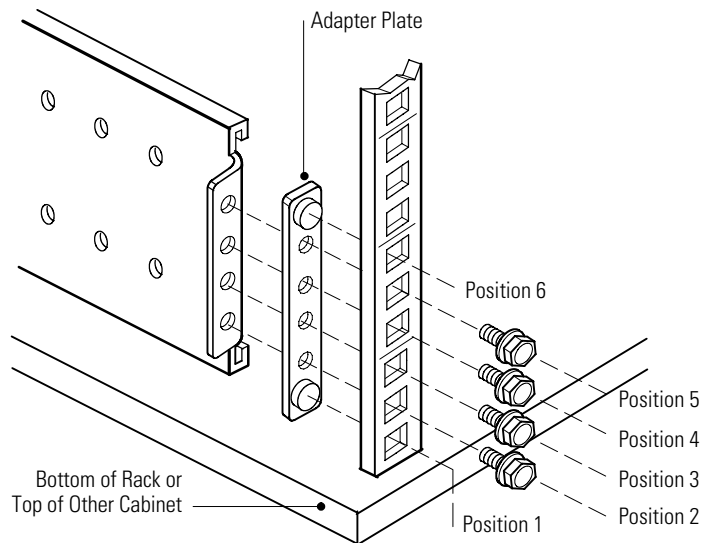


Figure 17. Securing the Rear Rail (Right Rail Assembly Shown)

6. Repeat Steps 3 through 5 for the other rail.
7. To tighten the rail adjustment, assemble four M4 machine screws and four M4 locknuts to the middle of the rail assembly. Tighten using a 7 mm (9/32") nut driver. See Figure 18.

Repeat for the other rail.

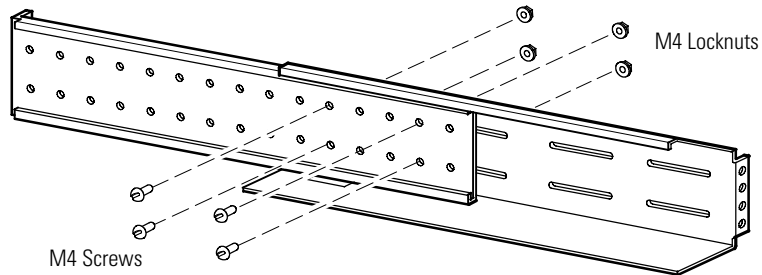


Figure 18. Tightening the Rail Adjustment (Right Rail Assembly Shown)

**CAUTION**

The UPS is heavy (see page 97). A minimum of two people are required to remove the UPS from its carton.

8. Place the UPS on a flat, stable surface with the front of the UPS facing toward you.
9. Remove the UPS front cover and the electronics module and set them aside (see Figure 19):

To remove the UPS front cover, loosen the two front cover screws. Grasp the fingergrrips on both sides of the cover and pull the cover forward firmly.

To remove the electronics module, turn the module lock switch to the UNLOCK position. Grasp the handle at the bottom of the module and pull the module slowly out of the cabinet. Use two hands to support the module.

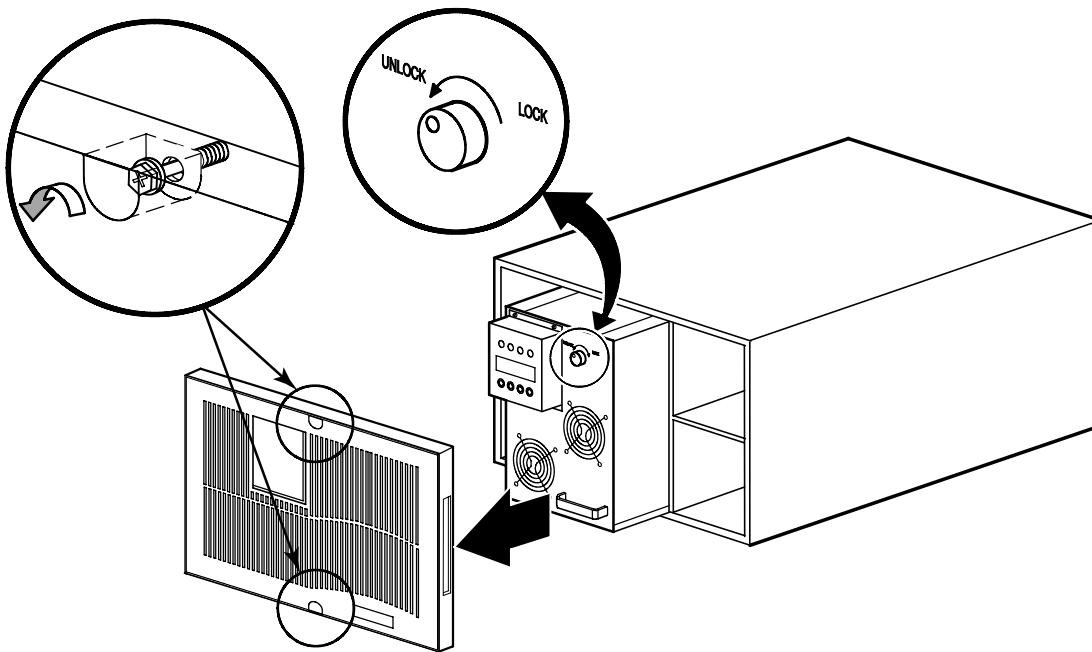


Figure 19. Removing the UPS Front Cover and Electronics Module

10. If the front and rear mounting brackets are already installed, skip to Step 13. If the brackets are not already installed, continue to Step 11.
11. Align the four front mounting brackets with the screw holes on the sides of the UPS and secure with 16 supplied M4 flat-head screws (see Figure 20).
12. Align the two rear mounting brackets with the lowest two screw holes on the sides of the UPS and secure with four supplied M4 flat-head screws.

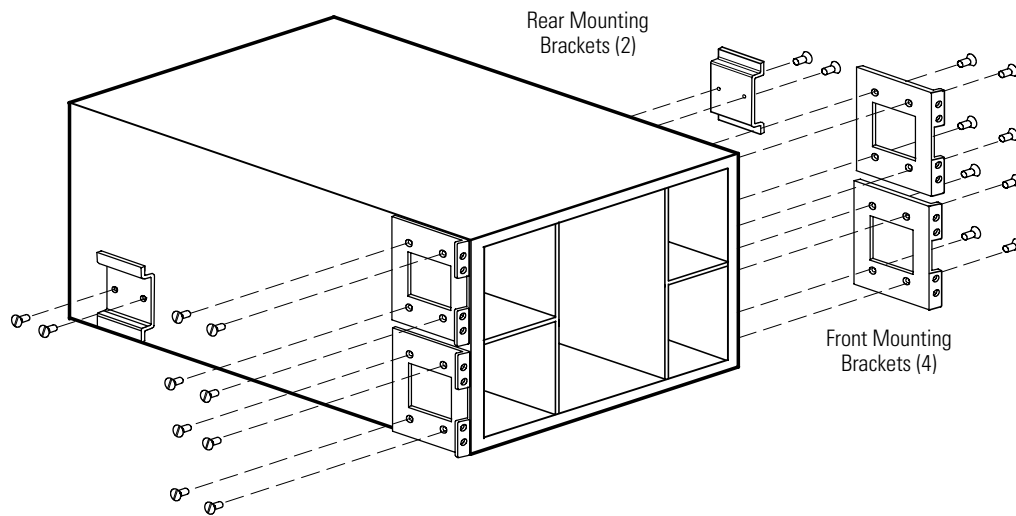


Figure 20. Installing the UPS Front and Rear Mounting Brackets

13. Install six cage or clip nuts as shown in Figure 21. If the rack holes are square, use six cage nuts. If the rack holes are round, use six clip nuts.
14. Slide the UPS into the rack. Verify that the rear mounting brackets engage in and slide easily along the inside of the rails.
15. Secure the front of the cabinet to the rack as shown in Figure 21.

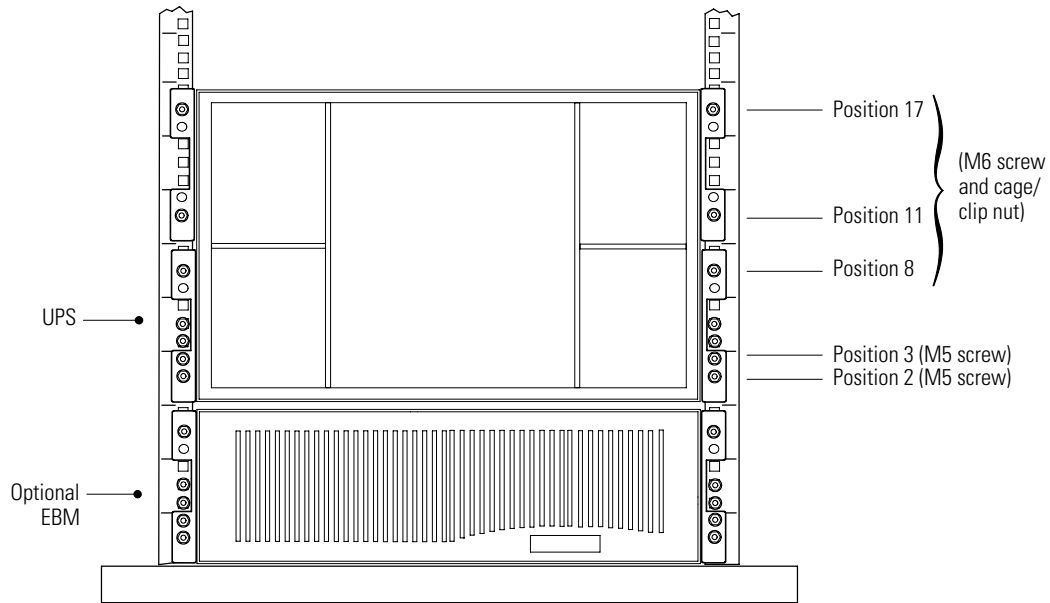


Figure 21. Securing the Front of the UPS



NOTE To install the optional seismic mounting brackets, the length of the rails must be between 28.5 and 32 inches.

16. If installing the optional seismic mounting brackets, align the two UPS seismic mounting brackets with the screw holes on the sides of the UPS above the rear mounting brackets. Loosely secure the brackets with the eight supplied wing bolts. See Figure 22.

Do not tighten the wing bolts.

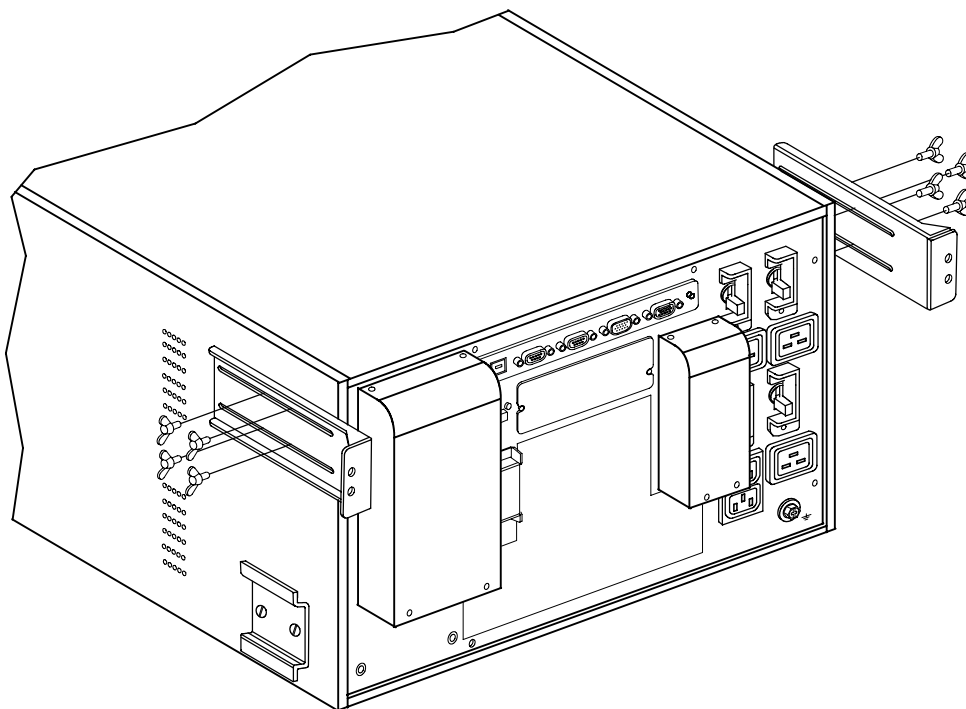


Figure 22. Installing the Optional UPS Seismic Mounting Brackets

17. If the optional seismic mounting brackets are installed, secure the brackets on the UPS to the rack using four M6 machine screws as shown in Figure 23.

Verify that the vent holes on the sides of the UPS are not covered by the seismic mounting brackets.

Tighten the wing bolts on the seismic mounting brackets.

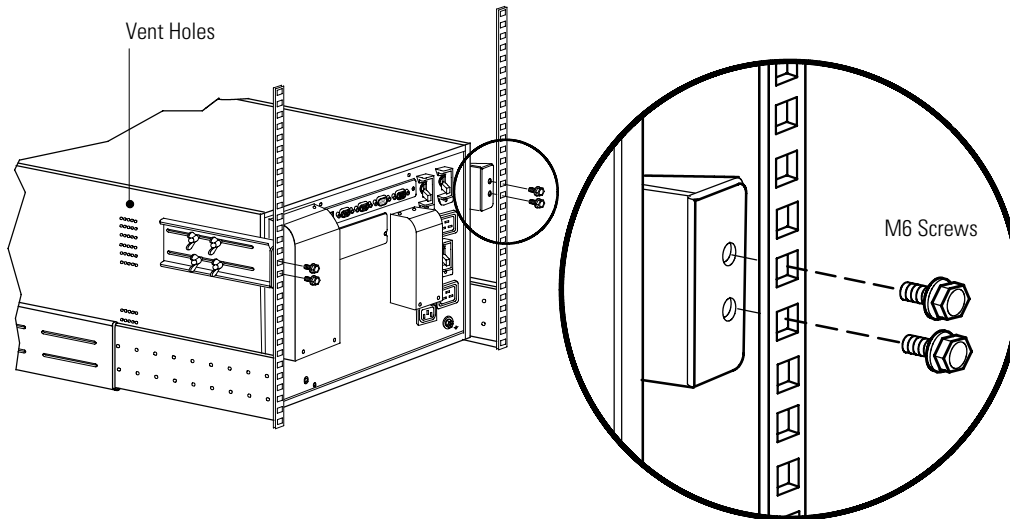


Figure 23. Securing the Optional UPS Seismic Mounting Brackets

18. Replace the electronics module by sliding it carefully into the cabinet. Verify that it seats against the rear of the cabinet.

Turn the module lock switch to the LOCK position.

Installing the UPS Internal Batteries

To install the battery trays into the UPS cabinet:

1. Verify that the output circuit breakers on the UPS rear panel are in the OFF (O) position (see Figure 26 on page 48).
2. Slide the battery trays into the cabinet (see Figure 24). Push each tray in until the battery tray lock on the handle catches to lock the tray in place.

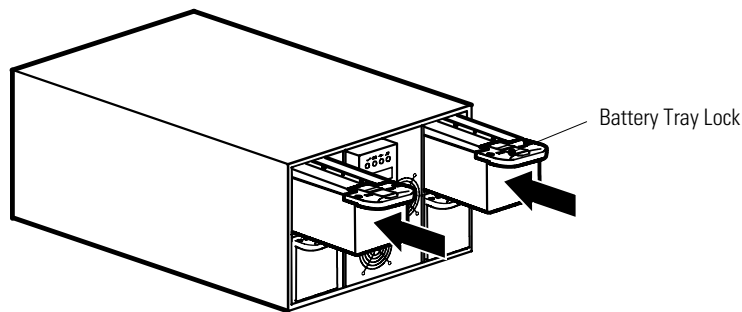


Figure 24. Installing the Battery Trays

3. Replace the UPS front cover and tighten the two front cover screws (see Figure 25).

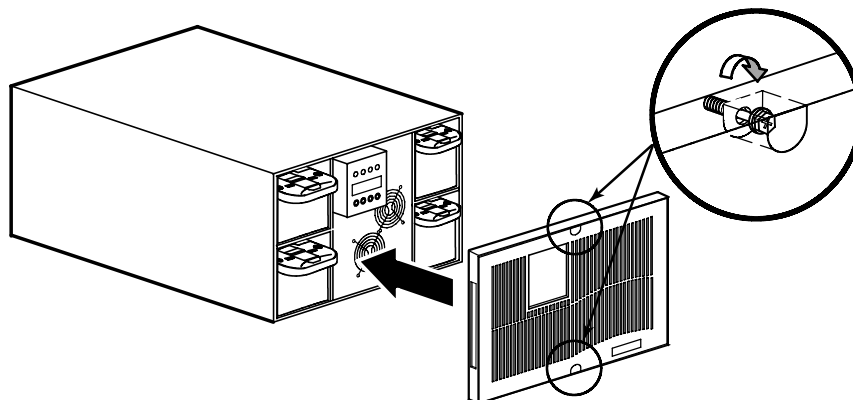


Figure 25. Replacing the UPS Front Cover

4. If you are installing an optional EBM, continue to the following section, "EBM Installation." Otherwise, continue to "UPS Installation" on page 49.

EBM Installation



CAUTION

A small amount of arcing may occur when connecting an EBM to the UPS. This is normal and will not harm personnel. Insert the EBM cable into the UPS battery connector quickly and firmly.

To install the optional EBM(s):

1. Verify that all battery circuit breakers are in the OFF (O) position (see Figure 26).
2. Remove the cable retention clip from the UPS battery connector. Retain the clip and two screws.
3. Remove the cable retention clip from all EBM battery connectors except on the EBM installed in the lowest position in the rack. Retain the clips and screws.
4. Plug the EBM cable(s) into the battery connector(s) as shown in Figure 26. Up to four EBMs may be connected to the UPS.
5. Turn each cable retention clip 90 degrees and reinstall each clip to hold the EBM cable firmly in place.
6. Continue to the following section, "UPS Installation."



NOTE After UPS installation, ensure maximum battery runtime by configuring the UPS for the correct number of EBMs (see page 78).

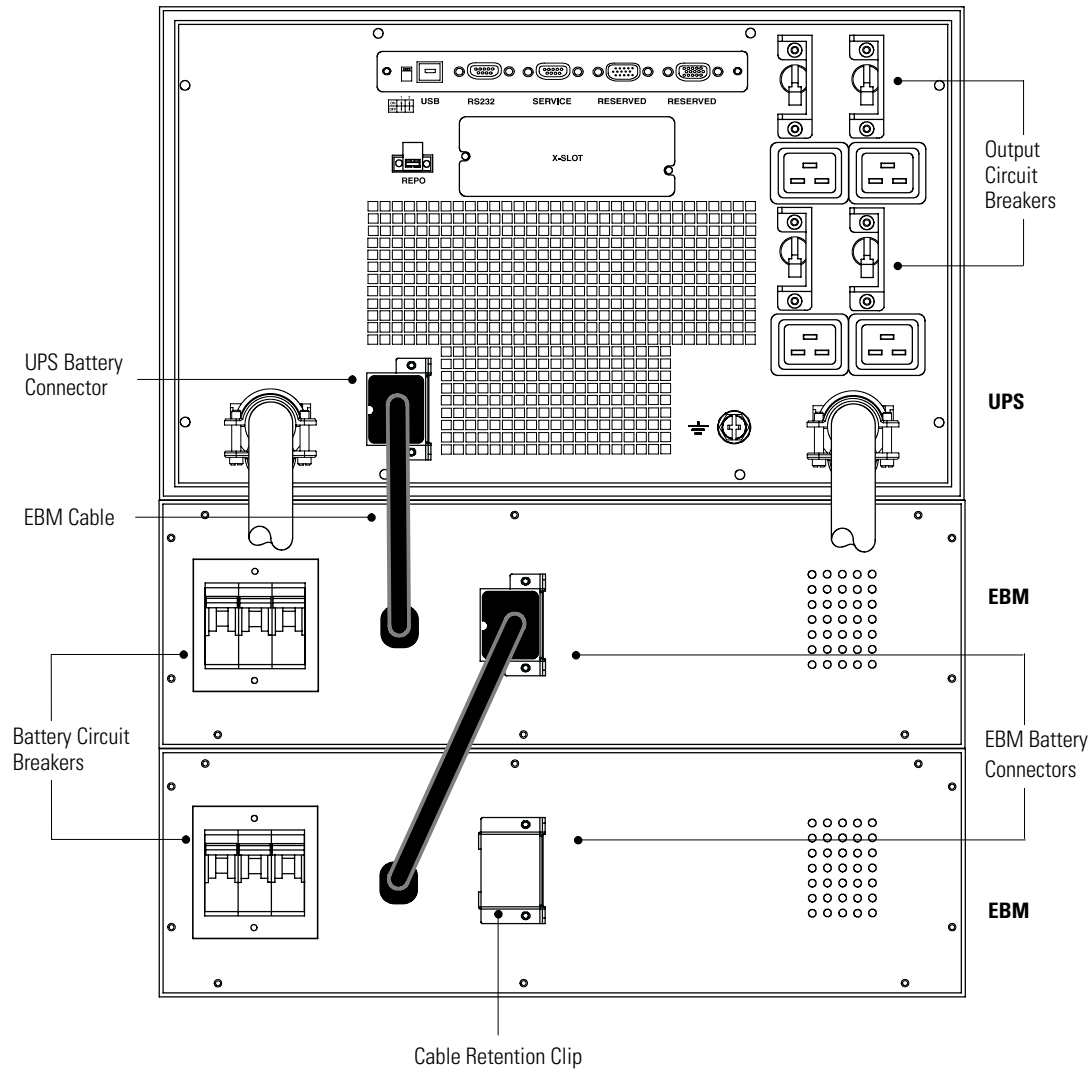


Figure 26. Typical EBM Installation

UPS Installation

For the PW9140 10000 or PW9140 7500 model, see the following section, “Plug-Receptacle UPS Installation.”

For the PW9140 10000 HW or PW9140 7500 HW model, see “Hardwired UPS Installation” on page 53.

Plug-Receptacle UPS Installation



NOTE *Do not make unauthorized changes to the UPS; otherwise, damage may occur to your equipment and void your warranty.*

The Powerware 9140 plug-receptacle models require a dedicated branch circuit that meets the following requirements:

- 60A (10 kVA models) or 50A (7.5 kVA models) circuit with short circuit and overcurrent protection
- 200–240 Vac
- 50/60 Hz
- The breaker must be wall-mounted and be readily accessible to the operator
- Flexible metal conduit (recommended for ease of service and maintenance)

To install a plug-receptacle UPS:

1. Verify that all circuit breakers are in the OFF (O) position.
2. If you are installing power management software, connect your computer to the USB port, UPS communication port, or optional X-Slot card (see page 81). For the communication port, use the supplied serial cable.
3. If your rack has conductors for grounding or bonding of ungrounded metal parts, connect the ground cable (not included) to the ground bonding screw. See Figure 27 on page 51 for the location of the ground bonding screw.



NOTE *DO NOT protect laser printers with the UPS because of the exceptionally high power requirements of the heating elements.*

NOTE *Verify that the total equipment ratings do not exceed the UPS capacity to prevent an overload alarm.*

4. Plug the equipment to be protected into the UPS output receptacles, but do not turn on the protected equipment (see Figure 27).
5. Make any necessary provisions for cord retention and strain relief.
6. If an emergency power-off (disconnect) switch is required by local codes, see “REPO and ROO Installation” on page 63 to install the REPO switch before powering on the UPS.

If you are not required to install a REPO switch, you can install an optional remote on/off (ROO) switch (see page 63).

7. Switch all circuit breakers to the ON (|) position.
8. Plug the UPS input power cord into an IEC 309-60A power outlet.

The  indicator flashes, indicating the UPS is in Standby mode with the equipment offline. The fans run and the LCD illuminates and displays the UPS startup screens.

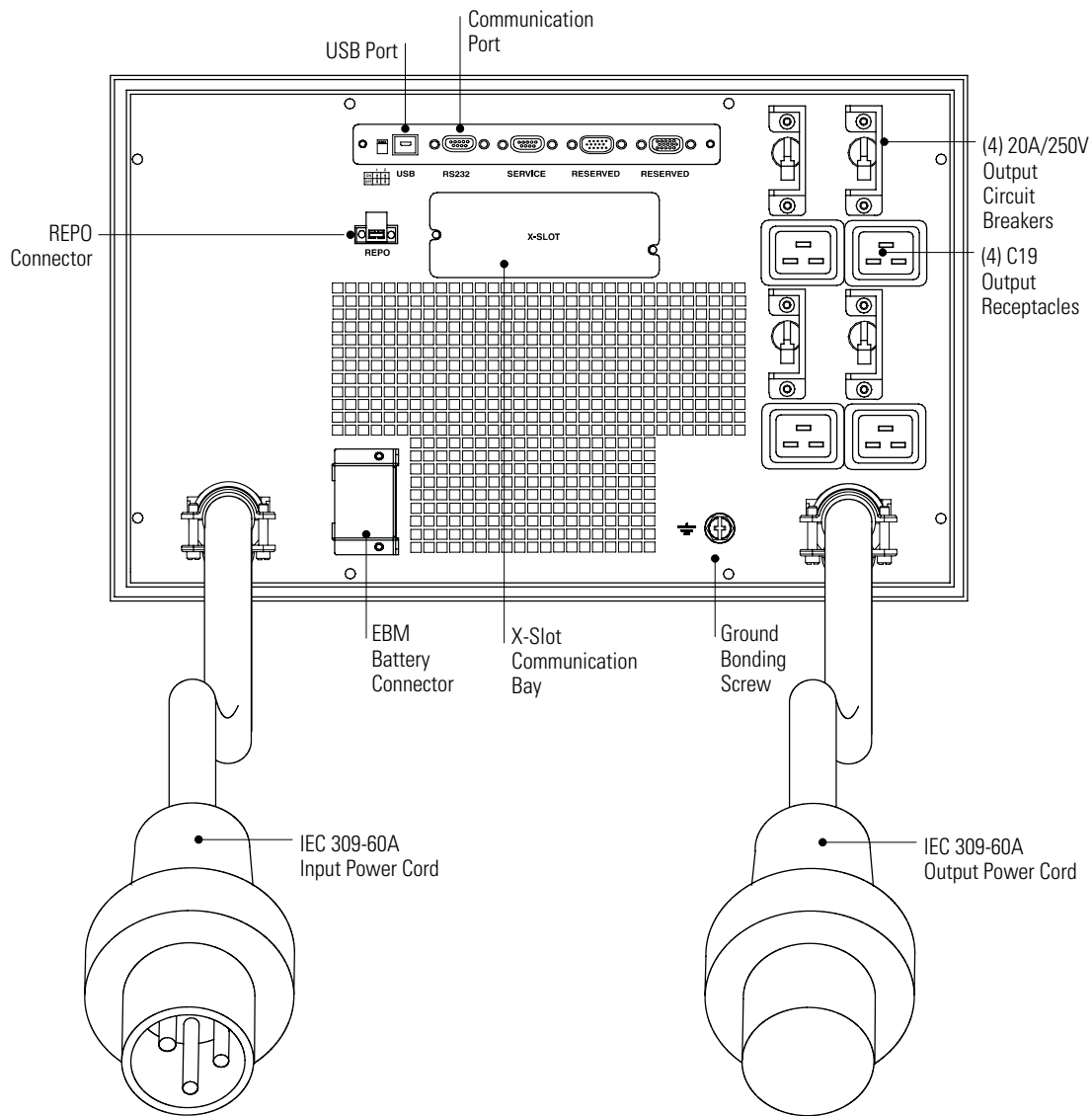


Figure 27. Plug-Receptacle UPS Rear Panel

9. To change the factory-set defaults, see “User Settings” on page 70.
10. Turn the UPS on by selecting MENU from the system status screen, then select CONTROL, OUTPUT CONTROL, UPS TO ONLINE, and OK to confirm.

The  indicator illuminates solid. The UPS is now in Normal mode and supplying power to your equipment.

If the alarm beeps or a UPS alarm indicator stays on, see “Troubleshooting” on page 101.

11. If you installed an optional REPO or ROO, test the REPO or ROO function:

Activate the external REPO or ROO switch. Verify the status change on the UPS display.

Deactivate the external REPO or ROO switch and restart the UPS.

12. If optional EBMs are installed, continue to “Configuring the UPS for EBMs” on page 78.



NOTE *The batteries charge to 80% capacity in less than 5 hours. However, it is recommended that the batteries charge for 48 hours after installation or long-term storage.*

Hardwired UPS Installation



WARNING

Only qualified service personnel (such as a licensed electrician) shall perform the electrical installation. Risk of electrical shock.



NOTE *Do not make unauthorized changes to the UPS; otherwise, damage may occur to your equipment and void your warranty.*

The Powerware 9140 hardwired models require a dedicated branch circuit that meets the following requirements:

- **For single-phase:** 60A (10 kVA models) or 50A (7.5 kVA models) circuit with short circuit and overcurrent protection
For three-phase: 30A (10 kVA models) or 20A (7.5 kVA models) circuit with short circuit and overcurrent protection. A separate single-phase input must have a 60A (10 kVA models) or 50A (7.5 kVA models) breaker connected to the bypass input.
- 200–240 Vac line to neutral
- 50/60 Hz
- The breaker must be wall-mounted and be readily accessible to the operator
- Flexible metal conduit (recommended for ease of service and maintenance)

To hardwire the UPS:

1. Verify that all circuit breakers are in the OFF (O) position.
2. If you are installing power management software, connect your computer to the USB port, UPS communication port, or optional X-Slot card (see page 81). For the communication port, use the supplied serial cable.

3. Switch off utility power at the distribution point where the UPS will be connected. Be absolutely sure there is no power.
4. Remove the input and output terminal block covers and retain (see Figure 28).

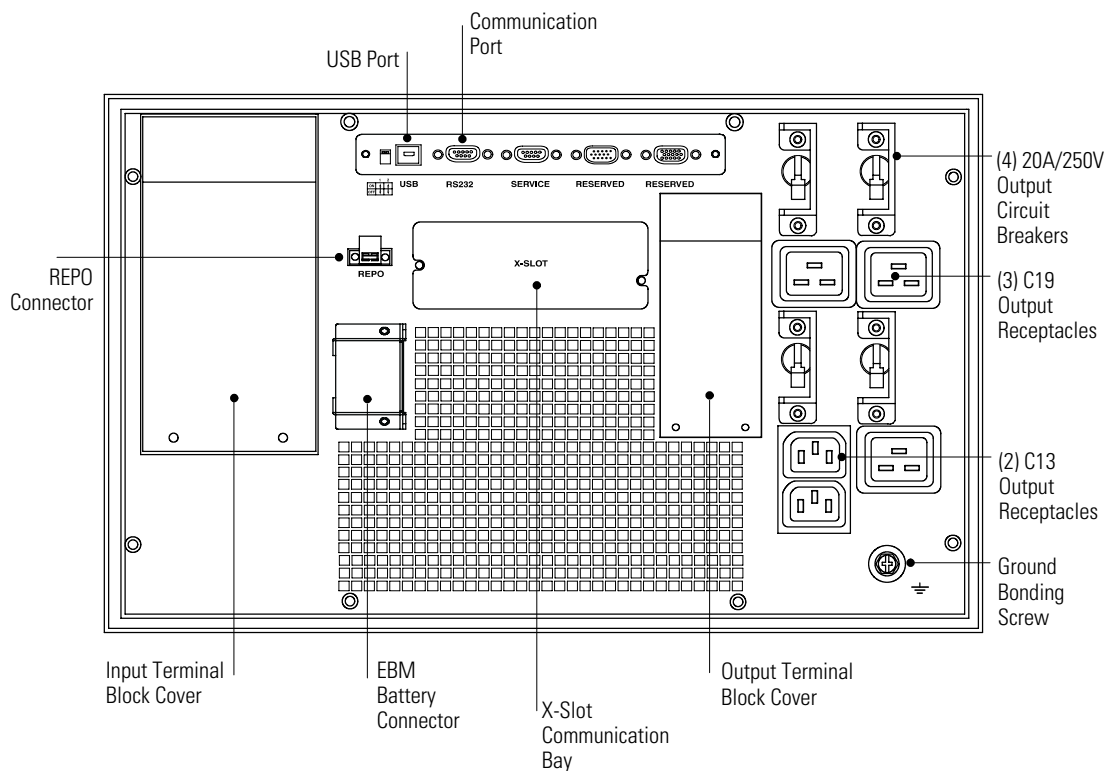


Figure 28. Hardwired UPS Rear Panel

5. Follow the instructions for the input configuration to be used with the UPS:

For single-phase, single input feed (see Figure 29), the input bypass terminal block is factory-wired. The L1-JP and L pins are connected by a short jumper wire, and the bypass is connected to the input terminal block's L1 automatically.

For single-phase, dual input feed (see Figure 30), remove the short jumper wire connecting the L1-JP and L pins so that you can connect the second feed to the input bypass terminal block later in this procedure.

For three-phase, dual input feed (see Figure 31), remove the short jumper wire connecting the L1-JP and L pins so that you can connect the second feed to the input bypass terminal block later in this procedure. Only a Y-type (star, 5-wire) input is supported. A delta (4-wire) input is NOT supported. Connect 380–415V L to L, 220–240V L to N. 208/120V three-phase input is NOT supported.



NOTE *A three-phase, single input feed configuration (jumping one of the phases of a three-phase input to the bypass input) is not recommended. Wire sizing and upstream breaker sizing would need to be similar to a single-phase input.*

NOTE *Neutrals are bonded inside the terminal block. Wire the input and bypass terminal blocks so they share the same ground and neutral and have inputs of the same frequency.*

NOTE *Install no more than one wire per terminal.*

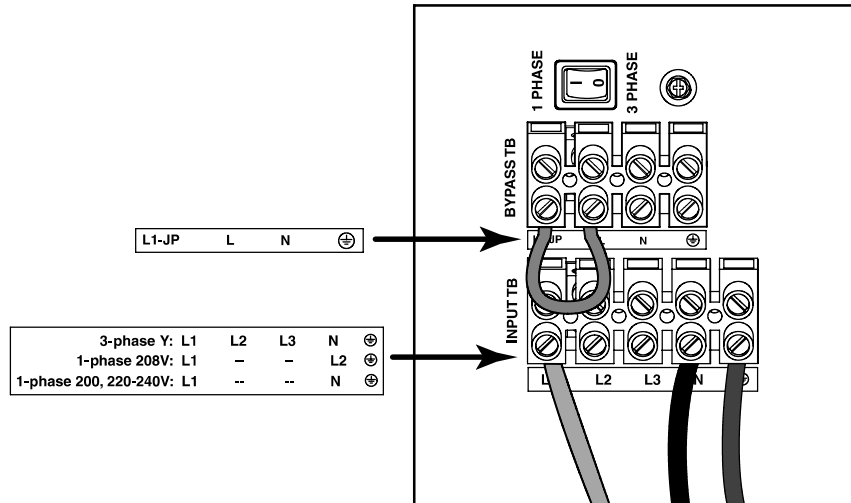


Figure 29. Single Input Feed (Single-Phase)

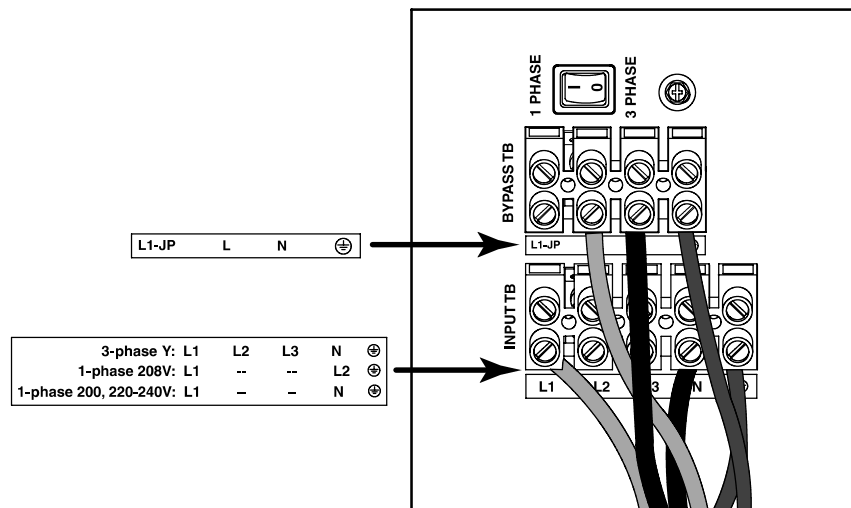


Figure 30. Dual Input Feed (Single-Phase)



NOTE Per NEC article 300-20(a), all three-phase conductors must be run in the same conduit. Neutral and ground must be run in the same conduit as the phase conductors.

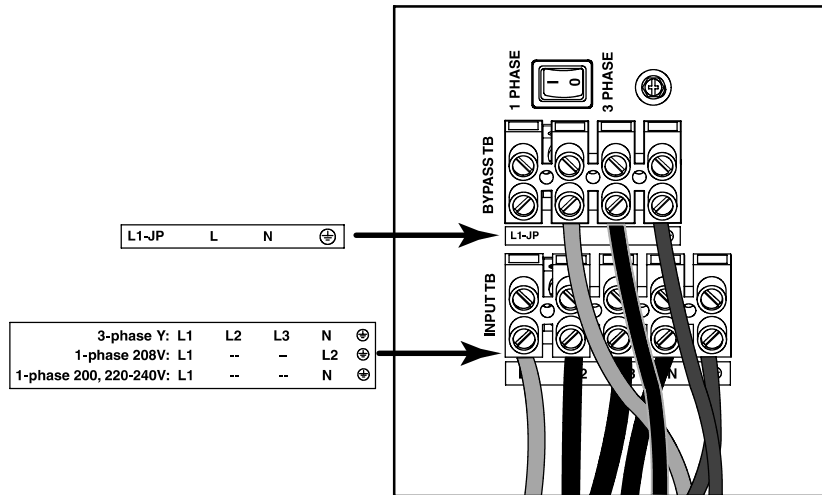


Figure 31. Dual Input Feed (Three-Phase)

6. Punch holes in the terminal block covers for the input, input bypass (dual input feed only), and output conduit using a Greenlee® punch or similar device. The holes accommodate up to 2" IMC conduit.
7. Pull the input, input bypass (dual input feed only), and output wires through separate conduit, leaving approximately 15 cm (6") of exposed wire. Attach a flexible metal fitting to the end of each conduit.
8. Insert each conduit through a wiring access entry and attach the conduit fitting to the panel. Strip 1.5 cm (0.5") of insulation from the end of each incoming wire.

9. Connect the input and ground wires to the input terminal block according to Figure 32 and Table 1.

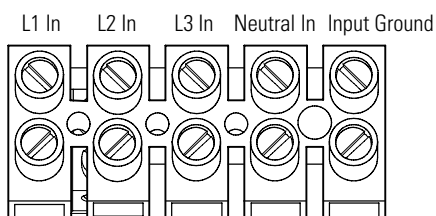


Figure 32. UPS Input Terminal Block

Table 1. UPS Input Wiring Specifications

UPS Terminal Block	Terminal Position	UPS Wire Function	Terminal Wire Size Rating ¹	Tightening Torque
Input	1	L1 In	13.3 mm ² (6 AWG) ⁴	1.8 Nm (16 lb in)
	2	L2 In		
	3	L3 In		
	4	Neutral In ²		
	5	Input Ground ³		

¹ Use 13.3 mm² (6 AWG) 90°C copper wire minimum. For ease of installation, use appropriately sized ferrules on the end of each wire.

² For single-phase 208V only, in North America and Japan, utility L2 connects to UPS neutral; for most other countries (200, 220-240V), utility neutral connects to UPS neutral.

³ The ground screw on the input terminal block can be used for input ground if an appropriate ring lug is available.

⁴ For three-phase, dual input feed, the three-phase input wires can be 5.3 mm² (10 AWG).

10. Connect the input bypass and ground wires to the input bypass terminal block according to Figure 33 and Table 2.

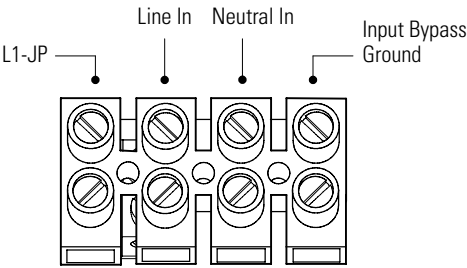


Figure 33. UPS Input Bypass Terminal Block

Table 2. UPS Input Bypass Wiring Specifications

UPS Terminal Block	Terminal Position	UPS Wire Function	Terminal Wire Size Rating*	Tightening Torque
Input Bypass	1	L1-JP	13.3 mm ² (6 AWG)	1.8 Nm (16 lb in)
	2	Line In		
	3	Neutral In		
	4	Input Bypass Ground		

* Use 13.3 mm² (6 AWG) 90°C copper wire minimum. For ease of installation, use appropriately sized ferrules on the end of each wire.

11. Connect the output and ground wires to the output terminal block according to Figure 34 and Table 3.

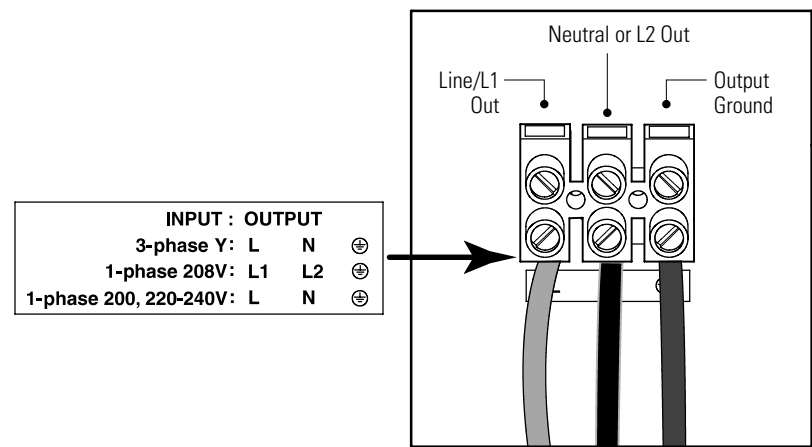


Figure 34. UPS Output Terminal Block

Table 3. UPS Output Wiring Specifications

UPS Terminal Block	Terminal Position	UPS Wire Function	Terminal Wire Size Rating ¹	Tightening Torque
Output	1	Line / Line 1 Out	13.3 mm ² (6 AWG)	1.8 Nm (16 lb in)
	2	Neutral Out ²		
	3	Output Ground		

¹ Use 13.3 mm² (6 AWG) 90°C copper wire minimum. For ease of installation, use appropriately sized ferrules on the end of each wire.

² Line 2 Out (single-phase 208V only).

12. Set the phase input selector switch for single-phase or three-phase input. See Figure 31 on page 57 for the location of the switch.



NOTE *The UPS will not operate if the input is wired for single-phase and the selector switch is set for three-phase.*

NOTE *If the input is wired for three-phase and the selector switch is set for single-phase, the UPS will operate on single-phase. Operating the UPS in this configuration is NOT recommended and could result in unintended upstream breaker tripping and overheating of the input wiring, if the breaker and wiring are sized for three-phase input.*

NOTE *Resetting the phase input selector switch while the UPS is running has no effect on UPS operation. The UPS reads the position of the switch only when powering on.*

13. Replace the input and output terminal block covers.
14. If your rack has conductors for grounding or bonding of ungrounded metal parts, connect the ground cable (not included) to the ground bonding screw. See Figure 28 on page 54 for the location of the ground bonding screw.



NOTE *DO NOT protect laser printers with the UPS because of the exceptionally high power requirements of the heating elements.*

NOTE *Verify that the total equipment ratings do not exceed the UPS capacity to prevent an overload alarm.*

15. Plug the equipment to be protected into the UPS output receptacles, but do not turn on the protected equipment (see Figure 28 on page 54).
16. Make any necessary provisions for cord retention and strain relief.
17. If an emergency power-off (disconnect) switch is required by local codes, see “REPO and ROO Installation” on page 63 to install the REPO switch before powering on the UPS.

If you are not required to install a REPO switch, you can install an optional remote on/off (ROO) switch (see page 63).

18. Switch the main utility breaker on.

19. Switch all circuit breakers to the ON (|) position.

The  indicator flashes, indicating the UPS is in Standby mode with the equipment offline. The fans run and the LCD illuminates and displays the UPS startup screens.

20. To change the factory-set defaults, see “User Settings” on page 70.

21. Turn the UPS on by selecting MENU from the system status screen, then select CONTROL, OUTPUT CONTROL, UPS TO ONLINE, and OK to confirm.

The  indicator illuminates solid. The UPS is now in Normal mode and supplying power to your equipment.

If the alarm beeps or a UPS alarm indicator stays on, see “Troubleshooting” on page 101.

22. If you installed an optional REPO or ROO, test the REPO or ROO function:

Activate the external REPO or ROO switch. Verify the status change on the UPS display.

Deactivate the external REPO or ROO switch and restart the UPS.

23. If optional EBMs are installed, continue to “Configuring the UPS for EBMs” on page 78.



NOTE *The batteries charge to 80% capacity in less than 5 hours. However, it is recommended that the batteries charge for 48 hours after installation or long-term storage.*

REPO and ROO Installation

The Powerware 9140 includes a two-position terminal (see Figure 35) that can be either left open or configured one of two ways:

- **As a remote emergency power-off (REPO) contact** that allows power to be switched off at the UPS output from a customer-supplied switch in a remote location.
- **As a remote on/off (ROO) contact** that allows the UPS to be turned on and off from a customer-supplied switch in a remote location.

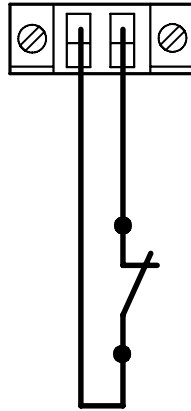


Figure 35. REPO/ROO Connection

WARNING



The REPO/ROO circuit is an IEC 60950 safety extra low voltage (SELV) circuit. This circuit must be separated from any hazardous voltage circuits by reinforced insulation.

CAUTION



To ensure the UPS stops supplying power to the load during any mode of operation, the input power must be disconnected from the UPS when the emergency power-off function is activated.



NOTE For Europe, the emergency switch requirements are detailed in Harmonized document HD-384-48 S1, "Electrical Installation of the Buildings, Part 4: Protection for Safety, Chapter 46: Isolation and Switching."

For more information about how the REPO and ROO features function, see "Remote Emergency Power-off and Remote On/Off" on page 82.

To install the REPO or ROO switch:

1. Verify that the UPS is off and disconnected from utility power.
2. Insert the REPO connector (provided in the accessory kit) into the REPO port on the UPS rear panel. See Figure 38 on page 81 for the location of the REPO port.
3. Refer to the following table to plan the REPO or ROO behavior:

REPO	Contact Open	Contact Closed
NC	Shutdown	Online
NO	Online	Shutdown
ROO	Contact Open	Contact Closed
NC	Online	Standby
NO	Standby	Online



WARNING

This connector must only be connected to an IEC 60950 safety extra low voltage (SELV) circuit. This circuit must be separated from any hazardous voltage circuits by reinforced insulation.

4. Connect the switch or circuit to the REPO connector using non-shielded 0.82 mm²–0.33 mm² (18–22 AWG) wire.



NOTE For REPO, a separate contact must simultaneously cause UPS input AC power to be removed.

5. Verify that the externally-connected REPO or ROO switch is not activated to enable power to the UPS output receptacles.
6. Plug in or apply utility power to the UPS. The UPS enters Standby mode.

7. **To configure the UPS for REPO behavior**, select MENU from the system status screen, then select SETUP, USER SETUP, and CONTACT CONFIG.

Set CONTACT USAGE to REPO. Then set CONTACT TYPE to either normally-open (N/O) or normally closed (N/C).

8. **To configure the UPS for ROO behavior**, select MENU from the system status screen, then select SETUP, USER SETUP, and CONTACT CONFIG.

Set CONTACT USAGE to REMOTE ON/OFF. Then set CONTACT TYPE to either normally-open (N/O) or normally closed (N/C).

9. **REPO only.** Start the UPS by selecting MENU from the system status screen, then select CONTROL, OUTPUT CONTROL, UPS TO ONLINE, and OK to confirm.
10. Activate the external REPO or ROO switch to test the function. Verify the status change on the UPS display.
11. **REPO only.** De-activate the external REPO switch and restart the UPS.

Chapter 4 Operation

This chapter contains information on how to use the Powerware 9140, including front panel operation, operating modes, UPS startup and shutdown, configuring the UPS for Extended Battery Modules (EBMs), initiating the battery test, and transferring the UPS between modes.

Control Panel Functions

The UPS has a four-button, two-line graphical LCD with backlight. It provides useful information about the UPS itself, load status, events, measurements, and settings (see Figure 36).

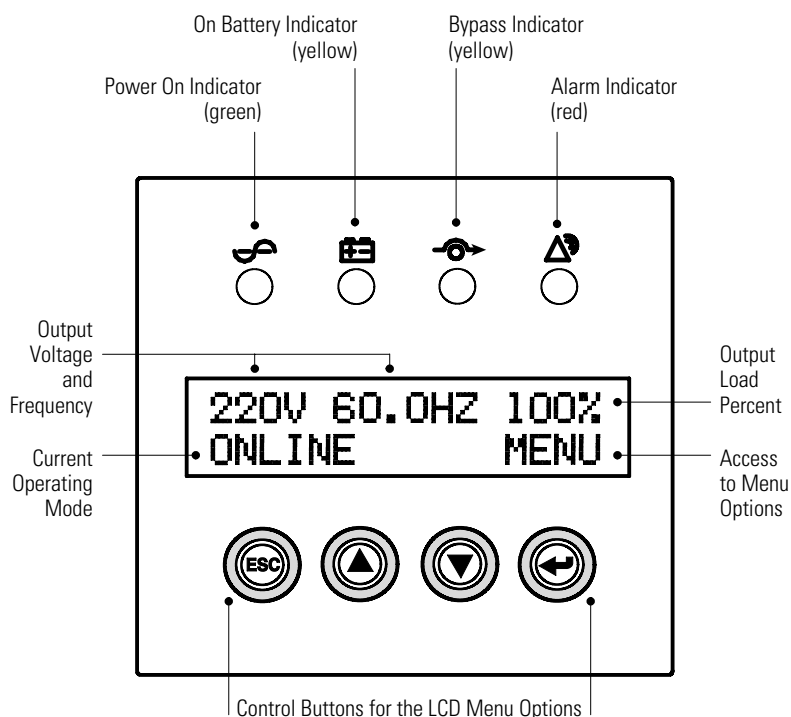


Figure 36. Powerware 9140 Control Panel (System Status Screen Shown)

The following table shows the indicator status and description.

Indicator	Status	Description
 Green	On	The UPS is operating normally.
	Slow Flash	The UPS is in Standby mode.
	Fast Flash	The UPS is starting up.
	Off	The UPS is turned off and will not turn on automatically.
 Yellow	On	The UPS is in Battery mode.
	Slow Flash	The UPS is in Battery mode and a Low Battery condition is detected.
	Fast Flash	A battery test is in progress.
 Yellow	On	The UPS is in Bypass mode.
	Slow Flash	Bypass mode is unavailable because the input utility is outside the configured bypass range.
 Red	Slow Flash	The UPS has an active warning alarm and is supporting the load. See "Troubleshooting" on page 101 for additional information.
All LEDs	Slow Flash	The UPS is powering down and the load is no longer supported.

Changing the Language

To change the language setting, select MENU from the system status screen, then select SETUP, USER SETUP, and LANGUAGE. Scroll through the available options and press the  button to select the language.

Display Functions

When the UPS starts up, the LCD displays the Eaton Powerware logo and the type of UPS.

About 5 seconds after startup or after 15 minutes of inactivity, the LCD displays the system status screen. The system status screen shows the output voltage, output frequency, output load percent, and the current operating mode (see Figure 36 on page 67).

The backlit LCD automatically dims after a long period of inactivity. Press any button to restore the screen.

From the system status screen, press the  button to select MENU. Use the two middle buttons ( and ) to scroll through the menu structure. Press the  button to select an option or enter a submenu. Press the **ESC** button to cancel or return to the previous menu.

The following table shows the basic menu structure.

Table 4. Menu Map for Display Functions

Main Menu	Submenu	Display Information or Menu Function
Control	Output Control	Turn the UPS on and off / Transfer to other modes
	Battery Test	Cancel a test / Schedule a test / View a test report
Status	Active Alarms	Display any active alarms
	UPS Output	Display the voltage, current, frequency, load, current, watts, and VA
	UPS Input	Display the current utility voltage and frequency
	Battery	Display the current positive and negative battery voltages, percent battery charge, and expected battery runtime in minutes
	DC Link	Display the current positive and negative rail voltages
	System	Display the system runtime (days/hrs/min/sec)
Alarm History		Display the most recent 50 events and alarms, by description, alarm number, and time (day/hr/mins/sec in system runtime).
Model Info		UPS Type / UPS Serial Number / UPS Part Number / Firmware Version
Setup	User Setup	See Table 5 for detail.
	Service Setup	This screen is password-protected.

User Settings

The following table displays the options that can be changed by the user.

Table 5. User Settings

Description	Available Settings	Default Setting
O/P (Output) Frequency*	[50 Hz][60 Hz][Auto] NOTE If Auto is selected, input frequencies <55 Hz are set to 50 Hz, and input frequencies ≥55 Hz are set to 60 Hz. O/P Frequency changes from Auto to the sensed frequency setting.	Auto
O/P (Output) Voltage	[200V][208V][220V][230V][240V][Auto] NOTE If Auto is selected, input voltages <220V are set to 208V, and input voltages ≥220V are set to 230V. O/P Voltage changes from Auto to the sensed voltage setting.	Auto
Buzzer Alarm	[Enabled][Disabled]	Enabled
Battery Pack	1 through 5 NOTE A value of 1 indicates the UPS internal batteries only. See "Configuring the UPS for EBMs" on page 78.	1
Battery Test	[Enabled][Disabled] NOTE When Enabled, the battery test runs automatically approximately every three months.	Enabled
DC Start	[Enabled][Disabled]	Shipped: Disabled After one startup and shutdown sequence: Enabled
Auto Restart	[Enabled][Disabled]	Enabled
UPS ID	0 through 3 NOTE This option is not used.	0

* Changes to these options should be made before turning on the UPS (while the UPS is in Standby mode); otherwise, the changes do not take effect.

Table 5. User Settings (continued)

Description	Available Settings	Default Setting
Language	Select Language: <English> <Spanish> <French> <German> <Finnish>	English
XCP Load Control	[Enabled][Disabled]	Enabled
Upper Bypass V	+0 through +20% (1% increments)	+20%
Lower Bypass V	-0 through -20% (1% increments)	-20%
Bypass Freq Dev (Bypass Frequency Deviation Limits)	1 through 5 Hz (1 Hz increments) NOTE This value sets the limits from 1 Hz to 5 Hz of the nominal output configuration.	3 Hz
Qualify Bypass	[Enabled][Disabled] NOTE This setting enables or disables the bypass qualification rules. When set to Disabled, Bypass is always available.	Enabled
Allow Bypass	[Enabled][Disabled]	Enabled
Set Baud Rate	Port 1 (RS232): [19200] [9600] [2400] [1200] Port 2 (SERVICE): [19200] [9600] [2400] [1200]	9600
Set Site (Wiring) Fault	[Enabled][Disabled]	Disabled
Contact Config*	Contact Usage: [REPO][ROO][Disabled] Contact Type: [N/O][N/C]	REPO N/O

* Changes to these options should be made before turning on the UPS (while the UPS is in Standby mode); otherwise, the changes do not take effect.

Operating Modes

The Powerware 9140 front panel indicates the UPS status through the UPS indicators. Figure 36 on page 67 shows the UPS front panel indicators and controls. Figure 37 shows the internal circuit configuration.

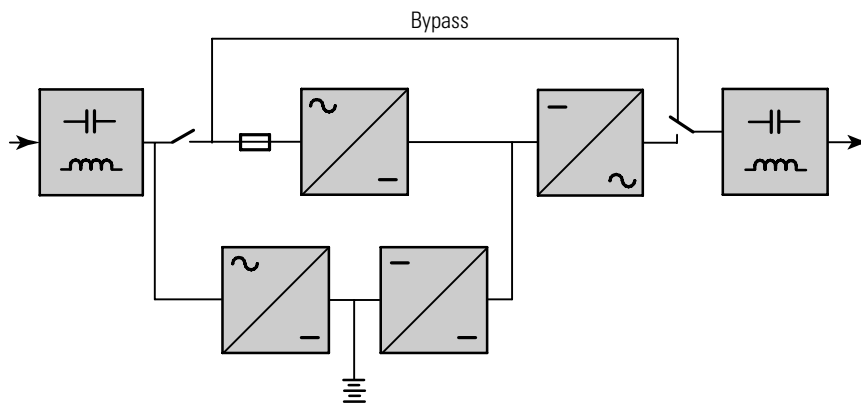


Figure 37. Internal Circuit Configuration

Normal Mode

During Normal mode, the  indicator illuminates solid and the UPS is powered from the utility. The UPS monitors and charges the batteries as needed and provides regulated and filtered power protection to your equipment.

Battery Mode

When the UPS is operating during a power outage, the alarm beeps once every five seconds and the  indicator illuminates solid.

When the utility power returns, the UPS transfers to Normal mode operation while the battery recharges.

If battery capacity becomes low while in Battery mode, the  indicator flashes slowly and the alarm becomes continuous. If the Battery Low alarm is set, the  indicator also flashes. This warning is approximate, and the actual time to shutdown may vary significantly.



NOTE Depending on the UPS load and the number of Extended Battery Modules (EBMs), the Battery Low warning may occur before the batteries reach 25% capacity. See Table 13 on page 100 for estimated runtimes.

When utility power is restored after the UPS shuts down, the UPS automatically restarts.

Bypass Mode

In the event of a UPS overload or internal failure, the UPS transfers your equipment to utility power. Battery mode is not available; however, the utility power continues to be passively filtered by the UPS. The  indicator illuminates. The UPS transfers to Bypass mode when:

- The user activates Bypass mode through the front panel.
- The UPS detects the electronics module being replaced.
- The UPS has an overtemperature condition.
- The UPS detects an internal failure.
- The UPS has an overload condition of 110 to 130% for 60 seconds, 130 to 150% for 1 second, or greater than 150% for 100 ms.

If an overload condition is corrected, the UPS returns to Normal mode. However, if an overload condition occurs three times within 20 minutes, the UPS will lock on Bypass for one hour.

Standby Mode

When the UPS is turned off and remains plugged into a power outlet, the UPS is in Standby mode. The  indicator flashes slowly, indicating that power is not available to your equipment. The battery recharges when necessary.

UPS Startup and Shutdown



WARNING

Only qualified service personnel (such as a licensed electrician) should perform the UPS installation and initial startup. Risk of electrical shock.

Verify that UPS installation has been carried out correctly and the UPS ground has been connected.

Normal Mode Startup



NOTE If the UPS detects that utility power is unavailable or out of range, and the DC Start user setting is enabled, the UPS will automatically start up on battery.

To start up the UPS with utility power connected:

1. Turn off all protected equipment before starting up the UPS.
2. Switch on utility power where the UPS is connected.
3. Wait for the front panel LCD to illuminate.

The LCD displays the startup screen for five seconds, then displays the system status screen. The fans run. The  indicator flashes quickly then slowly, indicating that the UPS has entered Standby mode.

4. Switch all output circuit breakers to the ON (|) position.
5. Select MENU from the system status screen, then select CONTROL, OUTPUT CONTROL, UPS TO ONLINE, and OK to confirm.

The LCD displays a confirmation message and the  indicator illuminates solid. The UPS is now in Normal mode and supplying power to your equipment.

If the  indicator is flashing, check the UPS status from the front panel to view the active alarms. Correct the alarms and restart if necessary.

6. Turn on the protected equipment.

Starting the UPS on Battery



NOTE Before using this feature, the UPS must have been powered by utility power at least once.

To start the UPS on battery without utility power connected:

1. Turn off all protected equipment before starting up the UPS.
2. Switch all output circuit breakers to the ON (|) position.
3. Press any button on the front panel display to activate the screen.
4. Wait for the front panel LCD to illuminate.

The LCD displays the startup screen for five seconds, then displays the system status screen. The fans run. The  indicator flashes quickly then slowly, indicating that the UPS has entered Standby mode.

5. Select MENU from the system status screen, then select CONTROL, OUTPUT CONTROL, UPS TO BATTERY, and OK to confirm.

The LCD displays a confirmation message and the  indicator illuminates solid. The UPS is now in Battery mode and supplying battery power to your equipment.

6. Turn on the protected equipment.

Internal Bypass Startup

To start up the UPS in internal Bypass mode with utility power connected:

1. Turn off all protected equipment before starting up the UPS.
2. Switch on utility power where the UPS is connected.
3. Wait for the front panel LCD to illuminate.

The LCD displays the startup screen for five seconds, then displays the system status screen. The fans run. The  indicator flashes quickly then slowly, indicating that the UPS has entered Standby mode.

4. Switch all output circuit breakers to the ON (|) position.
5. Select MENU from the system status screen, then select CONTROL, OUTPUT CONTROL, UPS TO BYPASS, and OK to confirm.

The LCD displays a confirmation message, the  indicator illuminates solid, the  indicator flashes, and the alarm sounds, indicating the UPS is operating in Bypass mode. The load is now powered by utility power.

(Optional) Press any button to silence the alarm.

6. Turn on the protected equipment.

UPS Shutdown from Normal or Bypass Mode

To shut down the UPS from Normal or Bypass mode:

1. Turn off or remove all protected equipment before turning off or shutting down the UPS.
2. Select MENU from the system status screen, then select CONTROL, OUTPUT CONTROL, and UPS TO OFF.
3. Confirm the selection by pressing and holding the  button for three seconds to select OK.

The LCD displays a confirmation message and the  indicator flashes slowly, indicating that the UPS is no longer supporting the load and has transferred to Standby mode.

4. To shut down the UPS from Standby mode, unplug or remove utility power from the UPS.

The UPS powers down, all indicators flash slowly, and the UPS shuts down completely in approximately 10 seconds.

UPS Shutdown from Battery Mode

To shut down the UPS from Battery mode:

1. Turn off or remove all protected equipment before turning off or shutting down the UPS.
2. Select MENU from the system status screen, then select CONTROL, OUTPUT CONTROL, and UPS TO SHUTDOWN.
3. Confirm the selection by pressing and holding the  button for three seconds to select OK.

The LCD displays a confirmation message and all indicators flash slowly, indicating that the UPS is powering down and no longer supporting the load.

The UPS disconnects from the batteries and powers off in approximately 10 seconds.

Configuring the UPS for EBM's

To ensure maximum battery runtime, configure the UPS for the correct number of EBM's:

1. Select MENU from the system status screen, then select SETUP, USER SETUP, and BATTERY PACK.
2. Use the ▲ or ▼ button to select the number of battery packs in your UPS configuration:

All UPS and EBM Cabinets	Number of Battery Packs
UPS + 1 EBM	2
UPS + 2 EBM's	3
UPS + 3 EBM's	4
UPS + 4 EBM's	5

3. Press the ← button to save the setting.
4. Press the **ESC** button until the system status screen appears.

Initiating the Battery Test



NOTE The batteries must be fully charged and the UPS must not be in Battery mode to perform the battery test.

NOTE For an accurate battery test, test the UPS with at least 10% load applied to the UPS.

You can configure the battery test settings, initiate a test, cancel a test, and view the test report.

Configuring the Battery Test. The UPS automatically performs a battery test approximately every 90 days if this option is enabled. To enable or disable the automatic battery test, select MENU from the system status screen, then select SETUP, USER SETUP, and BATTERY TEST. Select to enable or disable the automatic test.

Initiating a Battery Test. To initiate a manual battery test, select MENU from the system status screen, then select CONTROL, BATTERY TEST, and SCHEDULE TEST. The UPS verifies the battery converter and schedules the battery test to occur during the next appropriate stage in the charging cycle (or immediately if possible). During the battery test, the  indicator flashes rapidly.

Canceling a Battery Test. To cancel a test already scheduled, select MENU from the system status screen, then select CONTROL, BATTERY TEST, and CANCEL TEST.

Viewing the Battery Test Report. To view a report of the latest battery test, select MENU from the system status screen, then select CONTROL, BATTERY TEST, and TEST REPORT.

Transferring the UPS Between Modes

From Normal to Bypass Mode. Select MENU from the system status screen, then select CONTROL, OUTPUT CONTROL, UPS TO BYPASS, and OK to confirm.

From Bypass to Normal Mode. Select MENU from the system status screen, then select CONTROL, OUTPUT CONTROL, UPS TO ONLINE, and OK to confirm.

From Standby to Bypass Mode. Select MENU from the system status screen, then select CONTROL, OUTPUT CONTROL, UPS TO BYPASS, and OK to confirm.

From Bypass to Standby Mode. Select MENU from the system status screen, then select CONTROL, OUTPUT CONTROL, and UPS TO OFF. Confirm the selection by pressing and holding the  button for three seconds to select OK.

Chapter 5 Communication

The Powerware 9140 UPS is equipped with a USB port, a REPO port, two DB-9 communication ports, and an X-Slot communication bay (see Figure 38). Two parallel ports are available for future use.

Either the USB port or the RS-232 DB-9 communication port may be used to monitor the UPS; however, they cannot operate simultaneously. The service DB-9 port is used only to upgrade the firmware.

The X-Slot communication bay can accommodate any Powerware X-Slot card and can operate simultaneously with the USB port or RS-232 communication port.

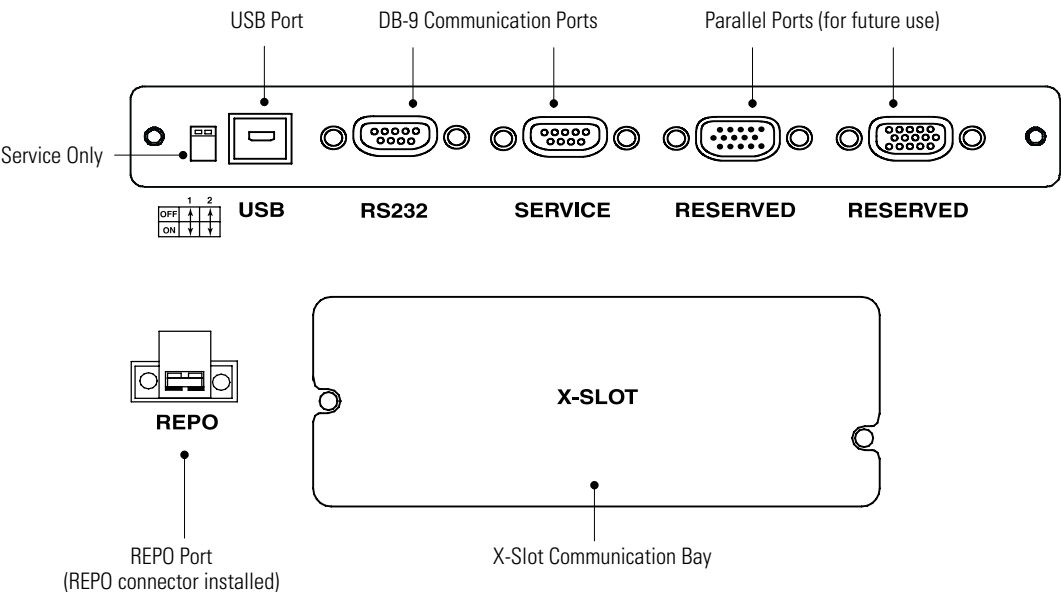


Figure 38. Communication Options

USB Port

The UPS can communicate with a USB-compliant computer using Powerware LanSafe® Power Management Software or other HID-compliant power management software compatible with Microsoft® Windows® 2000 and XP operating systems that support HID devices.



NOTE The latest versions of the Powerware LanSafe software and the USB firmware are available at www.powerware.com.

To establish communication between the UPS and a computer:

1. The USB port is hot-pluggable. Connect the USB cable to the USB port on the UPS rear panel (see Figure 38).

Connect the other end of the USB cable to the USB port on your computer.

2. Install the Powerware LanSafe software and USB drivers according to the instructions provided with the Software Suite CD.

Remote Emergency Power-off and Remote On/Off

The Powerware 9140 includes a two-position terminal that can be either left open or configured one of two ways:

- **As a remote emergency power-off (REPO) contact** that allows power to be switched off at the UPS output from a customer-supplied switch in a remote location.

The REPO feature shuts down the protected equipment immediately and does not follow the orderly shutdown procedure initiated by any power management software. Any devices that are operating on battery power are also shut down immediately. The UPS transfers to Standby mode, and the Control menu options are unavailable. This feature can be used for shutting down the load and the UPS by thermal relay, for instance in the event of room overtemperature.

When REPO is activated, the UPS shuts down all converters, de-energizes all system relays, and fully powers down the load immediately. If the utility breaker is also tripped, the UPS fully powers down within 10-15 seconds.

When the REPO switch is reset, the equipment will not return to Normal mode until the UPS is manually started.

- **As a remote on/off (ROO) contact** that allows the UPS to be turned on and off from a customer-supplied switch in a remote location.

If the ROO function is configured, energizing and de-energizing the load from the front panel is NOT available. However, transfers between Normal mode and Bypass mode are available through the front panel.

Two REPO/ROO positions may be used: normally-open or normally-closed. The pins on the normally-open REPO connector are not connected together. When this connection is closed:

- For REPO, the logic circuitry completely shuts down the UPS, thus preventing the power from supplying the load.
- For ROO, a remote on signal energizes the load, and opening the connection sends a remote off signal that de-energizes the load.



NOTE To restart the UPS, return the REPO terminal to its normal deactivated state, then use the front panel to return the UPS to Normal mode.

NOTE Disconnect the load when changing the active state of the ROO contact. The load will energize or de-energize as soon as the state is changed, depending on whether there is a jumper installed.



CAUTION

- The REPO must not be connected to any utility connected circuits. Reinforced insulation to the utility is required. The REPO switch must have a minimum rating of 24 Vdc and 20 mA.
- To ensure the UPS stops supplying power to the load during any mode of operation, the input power must be disconnected from the UPS when the emergency power-off function is activated.
- When REPO is activated for a UPS with line-to-line 208V input, the output receptacles will have 120V neutral (L2) to ground.

REPO/ROO Connections			
Wire Function		Terminal Wire Size Rating	Suggested Wire Size
REPO/ROO	L1	0.82–0.33 mm ² (18–22 AWG)	0.82 mm ² (18 AWG)
	L2		

DB-9 Communication Ports

The Powerware 9140 provides two DB-9 ports on the UPS rear panel. The service port is not intended for customer use and does not support standard communication protocols. The RS-232 port is available for UPS monitoring, control, and flash upgrades.

To establish communication between the UPS and a computer, connect your computer to the RS-232 UPS communication port using the supplied serial communication cable (see Figure 38 on page 81).

When the communication cable is installed, power management software can exchange data with the UPS. The software polls the UPS for detailed information on the status of the power environment. If a power emergency occurs, the software initiates the saving of all data and an orderly shutdown of the equipment.

The cable pins are identified in Figure 39 and the pin functions are described in Table 6.

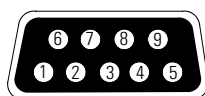


Figure 39. Communication Port

Table 6. Communication Port Pin Assignment

Pin Number	Signal Name	Function	Direction from the UPS
1	GND	Signal common (tied to chassis)	—
2	TxD	Transmit to external device	Out
3	RxD	Receive from external device	In
4	DTR	PnP (Plug and Play) from external device (tied to Pin 6)	In
5	GND	Signal common (tied to chassis)	—
6	DSR	To external device (tied to Pin 4)	Out
7	—	No Connection	—
8	—	No Connection	—
9	—	No Connection	—

X-Slot Cards

X-Slot cards allow the UPS to communicate in a variety of networking environments and with different types of devices. The Powerware 9140 has an available communication bay for one of the following X-Slot cards:

- **ConnectUPS™-X Web/SNMP Card** - has SNMP and HTTP capabilities as well as monitoring through a Web browser interface; connects to a twisted-pair Ethernet (10/100BaseT) network. It has a built-in switching hub that allows three additional network devices to be connected to the network without the requirement of additional network drops. In addition, a Powerware Environmental Monitoring Probe can be attached to obtain humidity, temperature, smoke alarm, and security information.
- **Relay Interface Card** - has isolated dry contact (Form-C) relay outputs for UPS status: Utility failure, Low battery, UPS alarm/OK, or On bypass.
- **Modbus® Card** - allows you to continuously and reliably monitor the UPSs in your Building Management System (BMS).
- **Multi-Server Card** - has six serial communication ports that can communicate simultaneously with other computers using Powerware LanSafe Power Management Software (provided on the Software Suite CD).
- **Single-Port Card** - connects to the Powerware Expansion Chassis to enable multiple communication options or to a PC for power management control.

See Figure 38 on page 81 for the location of the X-Slot communication bay.

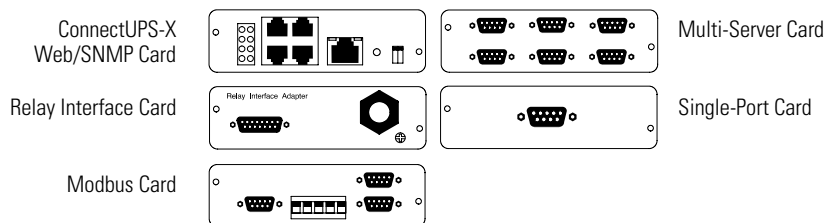


Figure 40. Optional X-Slot Cards

Powerware LanSafe Power Management Software

Each Powerware 9140 UPS ships with Powerware LanSafe Power Management Software. To begin installing Powerware LanSafe software, see the instructions accompanying the Software Suite CD.



NOTE When installing Powerware LanSafe software, select serial port installation. For the UPS manufacturer and model, select **Powerware** and **Powerware 9140**. If the Powerware brand options are not available in your version of the software, select **Generic UPSs** for the manufacturer and **Generic XCP** for the model.

Powerware LanSafe software provides up-to-date graphics of UPS power and system data and power flow. It also gives you a complete record of critical power events, and it notifies you of important UPS or power information. If there is a power outage and the Powerware 9140 UPS battery power becomes low, Powerware LanSafe software can automatically shut down your computer system to protect your data before the UPS shutdown occurs.

Chapter 6 UPS Maintenance

This section explains how to:

- Care for the UPS and batteries
- Replace the UPS and EBM batteries
- Test new batteries
- Replace the electronics module
- Recycle used batteries or UPS

UPS and Battery Care

For the best preventive maintenance, keep the area around the UPS clean and dust-free. If the atmosphere is very dusty, clean the outside of the system with a vacuum cleaner.

For full battery life, keep the UPS at an ambient temperature of 25°C (77°F).



NOTE *The batteries in the UPS are rated for a 3–5 year service life. The length of service life varies, depending on the frequency of usage and ambient temperature. Batteries used beyond expected service life will often have severely reduced runtimes. Replace batteries at least every 5 years to keep units running at peak efficiency.*

Storing the UPS and Batteries

If you store the UPS for a long period, recharge the battery every 10 months by connecting the UPS to utility power. The batteries charge to 80% capacity in less than 5 hours. However, it is recommended that the batteries charge for 48 hours after long-term storage.

Check the battery recharge date on the shipping carton label. If the date has expired and the batteries were never recharged, do not use the UPS. Contact your service representative.

When to Replace Batteries

When the  indicator flashes slowly and the audible alarm beeps intermittently, the batteries may need replacing. Contact your service representative to order new batteries.

Replacing Batteries



NOTE *DO NOT DISCONNECT the batteries while the UPS is in Battery mode.*

Batteries can be replaced easily without turning the UPS off or disconnecting the load.

If you prefer to remove input power to change the batteries, see “UPS Shutdown from Normal or Bypass Mode” on page 77.

Consider all warnings, cautions, and notes before replacing batteries.



WARNING

- Servicing should be performed by qualified service personnel knowledgeable of batteries and required precautions. Keep unauthorized personnel away from batteries.
 - Batteries can present a risk of electrical shock or burn from high short circuit current. The following precautions should be observed: 1) Remove watches, rings, or other metal objects; 2) Use tools with insulated handles; 3) Do not lay tools or metal parts on top of batteries; 4) Disconnect charging source prior to connecting or disconnecting battery terminals; 5) Wear rubber gloves and boots.
 - When replacing batteries, replace with the same type and number of batteries or battery packs. Contact your service representative to order new batteries.
 - Proper disposal of batteries is required. Refer to your local codes for disposal requirements.
 - Never dispose of batteries in a fire. Batteries may explode when exposed to flame.
 - Do not open or mutilate the battery or batteries. Released electrolyte is harmful to the skin and eyes and may be extremely toxic.
 - Determine if the battery is inadvertently grounded. If inadvertently grounded, remove source from ground. Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock can be reduced if such grounds are removed during installation and maintenance (applicable to equipment and remote battery supplies not having a grounded supply circuit).
 - **ELECTRIC ENERGY HAZARD.** Do not attempt to alter any battery wiring or connectors. Attempting to alter wiring can cause injury.
-

How to Replace EBM Batteries

To replace the EBM batteries:

1. Switch all battery circuit breakers to the OFF (O) position (see Figure 26 on page 48).
2. Remove the cable retention clip and screws and unplug the EBM cable from the UPS.

If additional EBMs are installed, remove the cable retention clip and screws and unplug the EBM cable from the battery connector on each EBM.

3. Remove the EBM front cover (see Figure 41).

To remove the front cover, loosen the two front cover screws. Grasp the fingerrips on both sides of the cover and pull the cover forward firmly.



CAUTION

Pull the battery trays out onto a flat, stable surface. The battery trays are unsupported when you pull them out of the EBM.

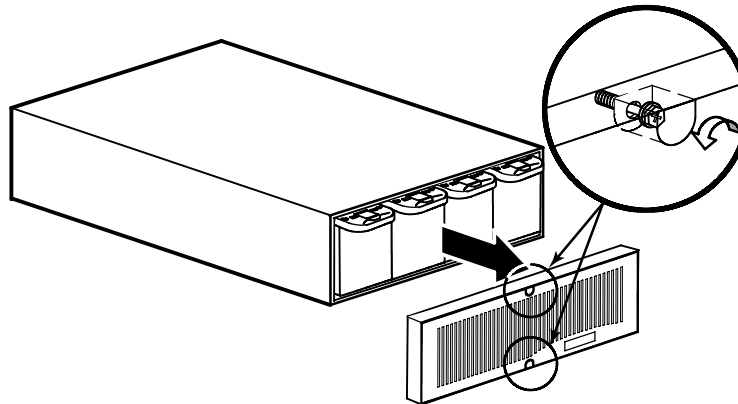


Figure 41. Removing the EBM Front Cover

4. Push down and hold the battery tray lock to unlock the tray. Pull the battery tray slowly out onto a flat, stable surface; use two hands to support the tray.

Repeat for each battery tray in the cabinet. See "Recycling the Used Battery or UPS" on page 95 for proper disposal.

5. Slide the new battery trays into the EBM cabinet (see Figure 42). Push each tray in until the battery tray lock on the handle catches to lock the tray in place.

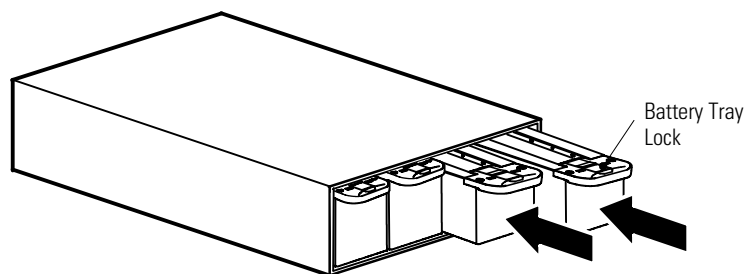


Figure 42. Installing the Battery Trays

6. Replace the EBM front cover (see Figure 43) and tighten the two front cover screws.

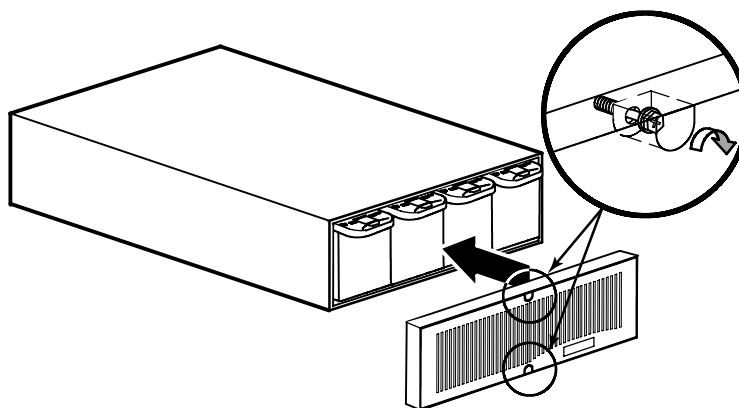


Figure 43. Replacing the EBM Front Cover

7. Repeat Steps 3 through 6 for each EBM.
8. Plug the EBM into the UPS as shown in Figure 26 on page 48.
For additional EBMs, plug the EBM cable into the battery connector on the adjacent EBM.
9. Reinstall the cable retention clip(s) and screws to hold the EBM cable(s) firmly in place.
10. Switch all battery circuit breakers to the ON (|) position.

How to Replace UPS Internal Batteries

To replace the UPS internal batteries:

1. Remove the UPS front cover (see Figure 44).

To remove the front cover, loosen the two front cover screws. Grasp the fingergrrips on both sides of the cover and pull the cover forward firmly.

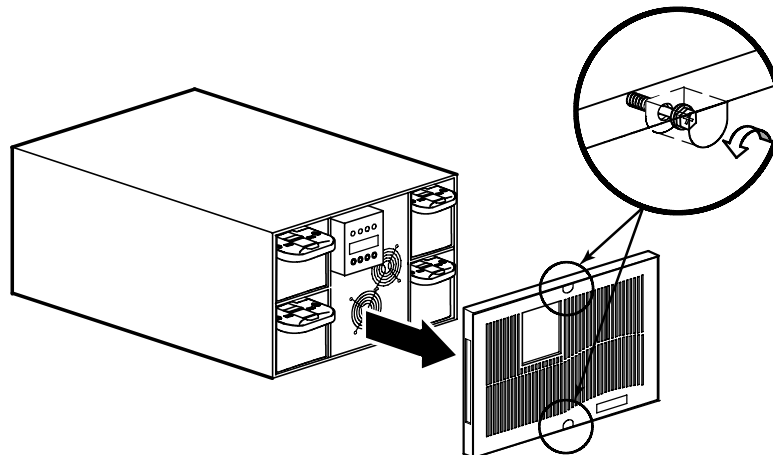


Figure 44. Removing the UPS Front Cover

CAUTION

Pull the battery trays out onto a flat, stable surface. The battery trays are unsupported when you pull them out of the UPS.

2. Push down and hold a battery tray lock to unlock a tray. Pull the battery tray slowly out onto a flat, stable surface; use two hands to support the tray. See Figure 45.

The UPS display indicates within 5–60 seconds that a battery is disconnected. However, if an optional EBM is installed, the display does not indicate a disconnected battery.

Repeat for each battery tray. See “Recycling the Used Battery or UPS” on page 95 for proper disposal.

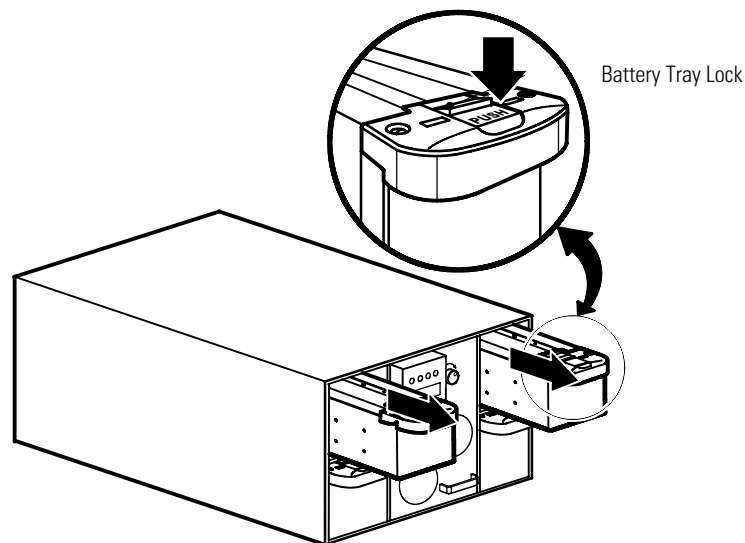


Figure 45. Removing the Battery Trays

3. Slide the new battery trays into the cabinet. Push each tray in until the battery tray lock on the handle catches to lock the tray in place.
4. Replace the UPS front cover and tighten the two front cover screws.

Testing New Batteries



NOTE *The batteries must be fully charged and the UPS must not be in Battery mode to perform the battery test.*

NOTE *For an accurate battery test, test the UPS with at least 10% load applied to the UPS.*

To test the new batteries:

1. Plug the UPS into a power outlet (apply utility power on hardwired models) for 48 hours to charge the battery.
2. Select MENU from the system status screen, then select CONTROL, BATTERY TEST, and SCHEDULE TEST.

The UPS verifies the battery converter and schedules the battery test to occur during the next appropriate stage in the charging cycle (or immediately if possible).

During the battery test, the  indicator flashes rapidly.

3. To view a report of the latest scheduled battery test, select MENU from the system status screen, then select CONTROL, BATTERY TEST, and TEST REPORT.

Replacing the Electronics Module

Consider all warnings and notes before replacing the electronics module.

The electronics module can be replaced easily without turning the UPS off or disconnecting the load. The UPS automatically transfers to Bypass mode. Battery mode is not available; however, the utility power continues to be passively filtered by the UPS.

If you prefer to remove input power to change the electronics module, see “UPS Shutdown from Normal or Bypass Mode” on page 77.

WARNING

- Servicing should be performed by qualified service personnel knowledgeable of batteries and required precautions. Keep unauthorized personnel away from batteries.
- **ELECTRIC ENERGY HAZARD.** Do not attempt to alter any battery or electronics module wiring or connectors. Attempting to alter wiring can cause injury.



NOTE *DO NOT DISCONNECT the electronics module while the UPS is in Battery mode.*

To replace the electronics module:

1. Remove the UPS front cover (see Figure 46).

To remove the front cover, loosen the two front cover screws. Grasp the fingergrrips on both sides of the cover and pull the cover forward firmly.

2. Turn the module lock switch to the UNLOCK position. The UPS transfers to Bypass mode.

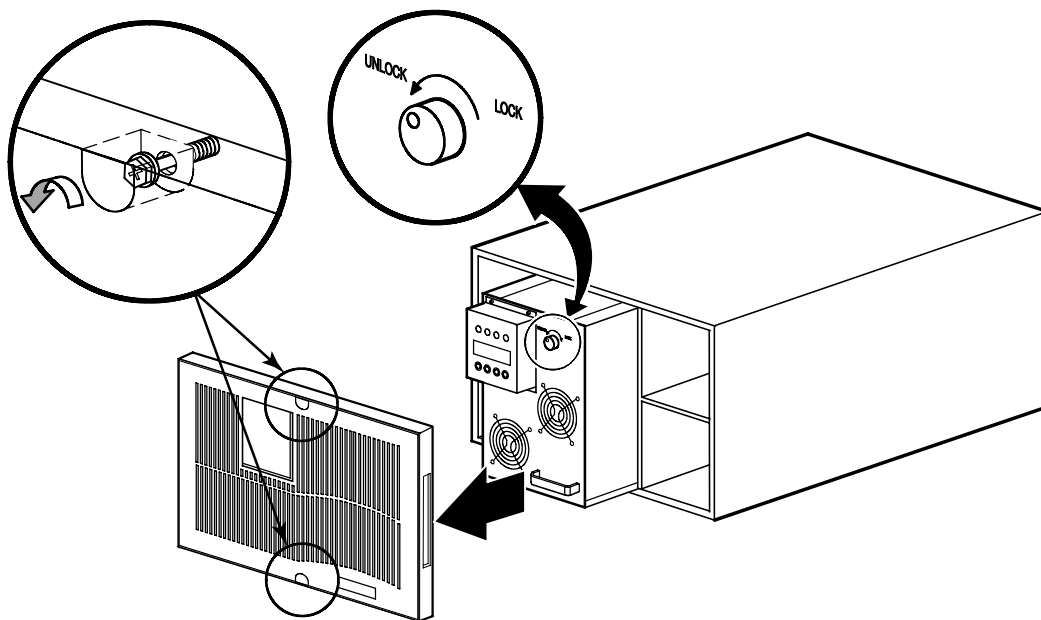


Figure 46. Removing the Electronics Module

3. Grasp the handle at the base of the electronics module and pull the module slowly out of the cabinet. Use two hands to support the module out onto a flat, stable surface.
4. Treat the original and replacement modules with care to avoid damaging connectors or internal circuitry. Label the original module with masking tape or some other identifier. Record the serial number of the replacement module for your warranty.

If not returning the electronics module for warranty, see the following section, "Recycling the Used Battery or UPS," for proper disposal.

5. Insert the replacement module by sliding it carefully into the cabinet. Verify that it seats firmly against the rear of the cabinet.
6. Turn the module lock switch to the LOCK position. The UPS automatically returns to Normal mode.
7. Replace the UPS front cover and tighten the two front cover screws.

Recycling the Used Battery or UPS

Contact your local recycling or hazardous waste center for information on proper disposal of the used battery or UPS.



WARNING

- Do not dispose of the battery or batteries in a fire. Batteries may explode. Proper disposal of batteries is required. Refer to your local codes for disposal requirements.
- Do not open or mutilate the battery or batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.



CAUTION

Do not discard the UPS or the UPS batteries in the trash. This product contains sealed, lead-acid batteries and must be disposed of properly. For more information, contact your local recycling/reuse or hazardous waste center.



CAUTION

Do not discard waste electrical or electronic equipment (WEEE) in the trash. For proper disposal, contact your local recycling/reuse or hazardous waste center.

Chapter 7 Specifications

This section provides the following specifications:

- Model list
- Weights and dimensions
- Electrical input and output
- Environmental and safety
- Battery

Table 7. Model List

UPS Model Number	Power Levels (Rated at Nominal Inputs)
PW9140 10000	10 kVA, 8 kW*
PW9140 10000 HW	
PW9140 7500	7.5 kVA, 6 kW
PW9140 7500 HW	
EBM Model Number	
PW9140 192V EBM	

* 9 kVA, 7.2 kW (derated at 200V input)

Table 8. Weights and Dimensions

	UPS	Extended Battery Module (EBM)
Dimensions (WxDxH)	43.0 × 76.0 × 26.2 cm 16.9 × 29.9" × 10.3" (6U)	43.0 × 66.0 × 13.1 cm 16.9" × 26.0" × 5.2" (3U)
Weights	Plug-Receptacle Chassis: 42 kg (92 lb) Hardwired Chassis: 39 kg (86 lb) (4) Internal Battery Trays: 17 kg (37 lb) each Total Plug-Receptacle UPS Weight: 110 kg (240 lb) Total Hardwired UPS Weight: 107 kg (234 lb)	EBM Chassis: 14 kg (31 lb) (4) Internal Battery Trays: 17 kg (37 lb) Total EBM Weight: 82 kg (179 lb)

Table 9. Electrical Input

Nominal Voltage	200/208/220/230/240V auto-sensing
Voltage Range	160–253V, 174–288V
Nominal Frequency	50/60 Hz auto-sensing
Frequency Range	45–65 Hz
Default Frequency	60 Hz (50 Hz for hardwired model, 220–240V)
Maximum Input Current at Nominal Utility Voltage	48A (not applicable for hardwired models)
Noise Filtering	MOVs and line filter for normal and common mode noise
Connections	3-meter IEC 309-60A power cord or hardwired
Input Power Factor	>0.99
Input Mode	Single-phase or three-phase (three-phase option on hardwired models only)

Table 10. Electrical Output

Regulation	Nominal output voltage $\pm 2\%$ Static, $\pm 10\%$ Dynamic	
Nominal Outputs	200/208/220/230/240V (voltage configurable or auto-sensing) 45/48/45/43/41A 9/10/10/10/10 kVA 7.2/8/8/8/8 kW	
Output Overload	100–110%: activates Overload alarm 110–130%: load transfers to Bypass mode after 1 minute 130–150%: load transfers to Bypass mode after 1 second >150%: load transfers to Bypass mode after 100 ms	
Voltage Waveform	Normal mode: Sine wave; <3% THD with linear load; <5% with nonlinear load	
Output Receptacles	Plug-Receptacle Models: (4) C19, each with 20A circuit breaker	Hardwired Models: (3) C19 and (1) dual C13, each with 20A circuit breaker
Full Output	IEC 309-60A	Hardwired

Table 11. Environmental and Safety

Operating Temperature	0°C to 40°C (32°F to 104°F) Optimal battery performance: 25°C (77°F)
Storage Temperature	-20°C to 50°C (-4°F to 122°F)
Transit Temperature	-20°C to 50°C (-4°F to 122°F)
Relative Humidity	0–95% noncondensing
Operating Altitude	Up to 3,000 meters above sea level
Transit Altitude	Up to 15,000 meters above sea level
Heat Dissipation	2066 BTU/hr (605.5W) maximum
Audible Noise	Less than 55 dBA at 5 feet with battery fully charged, without horn
Leakage Current	< 3.5 mA
Communication	DB-9: 1200-19200 baud; USB 1.1 compliant
Surge Suppression	ANSI C62.41 Category B3
Safety Conformance	UL 1778; CSA C22.2, No. 107.3; EN and IEC 62040-2; NOM-019-SCFI-1993; EN and IEC 62040-1-1 (Hardwired models only); EN and IEC 60950-1 (Hardwired models only)
Agency Markings	cULus, cUL, NOM, CE Hardwired models only: TÜV
EMC (Class A)	EN 50091-2, FCC Part 15, ICES-003
Seismic	Uniform Building Code (UBC) and Bellcore for Zone 4 Earthquake

Table 12. Battery

	UPS Internal Batteries	+1 EBM	+2 EBMs	+3 EBMs	+4 EBMs
Type	Sealed, maintenance-free, valve-regulated, lead-acid				
Monitoring	Advanced monitoring for earlier failure detection and warning				
Configuration	(32) 12V, 5 Ah				
Charging (in minutes) (10 kVA models)	266	336	368	398	419
Charging (in minutes) (7.5 kVA models)	215	367	390	416	440

NOTE Charging times are approximate and are to 80% usable capacity at nominal line voltage after full load discharge.

Table 13. Battery Runtimes (in Minutes)

Load (10 kVA Models)	UPS Internal Batteries	+1 EBM	+2 EBMs	+3 EBMs	+4 EBMs
100% Load	5	12	27	35	45
75% Load	7	17	35	46	60
50% Load	12	27	52	69	90
25% Load	31	61	99	138	181

Load (7.5 kVA Models)	UPS Internal Batteries	+1 EBM	+2 EBMs	+3 EBMs	+4 EBMs
100% Load	8.5	23.5	37.5	53	65.5
75% Load	12	30	52	69	86.5
50% Load	22	51.5	78.5	98.5	111
25% Load	48	94	116	>120	>180

NOTE Battery times are approximate and vary depending on the load configuration and battery charge.

Chapter 8 Troubleshooting

The Powerware 9140 is designed for durable, automatic operation and also alerts you whenever potential operating problems may occur. Usually the alarms shown by the control panel do not mean that the output power is affected. Instead, they are preventive alarms intended to alert the user. Use the following troubleshooting chart to determine the UPS alarm condition.

Typical Alarms and Conditions

The following table describes typical alarms and conditions; check the Alarm History through the front panel for a list of active alarms. If an alarm appears with a service code, please contact the Help Desk (see page 105).

Alarm or Condition	Possible Cause	Action
On Battery  LED is on. 1 short beep every 5 seconds.	A utility failure has occurred and the UPS is in Battery mode.	The UPS is powering the equipment with battery power. Prepare your equipment for shutdown.
Battery Low  LED is flashing slowly. Continuous beep.	The UPS is in Battery mode and the battery is running low.	This warning is approximate, and the actual time to shutdown may vary significantly. Depending on the UPS load and number of Extended Battery Modules (EBMs), the Battery Low warning may occur before the batteries reach 25% capacity. See Table 13 on page 100 for estimated runtimes. When utility power is restored, the UPS restarts automatically, provides power to the load, and charges the battery.
Battery Test  LED is flashing quickly. 1 long beep every 5 seconds.	A battery test is in progress.	Wait until the battery test completes.

Alarm or Condition	Possible Cause	Action
On Bypass  LED is on. 1 long beep every 5 seconds.	The UPS is in Bypass mode.	The equipment transferred to bypass utility power. Battery mode is not available; however, the utility power continues to be passively filtered by the UPS. Check for one of the following alarms: overtemperature, overload, UPS failure, hot swap, or remote emergency power-off (REPO).
Bypass Unavailable  LED is flashing slowly. 1 long beep every 5 seconds.	Bypass is not available because the bypass input utility is outside the configured bypass range.	Check the bypass utility. The UPS is receiving bypass utility power that may be unstable or in brownout conditions. The UPS continues to supply power to your equipment. Check for one of the following alarms: bypass over or under voltage, bypass over or under frequency, or bypass unavailable.
Battery Connection  LED is on. 1 long beep every 5 seconds.	The UPS does not recognize the internal batteries. A battery tray is disconnected.	If the condition persists, contact your service representative. Verify that all battery trays are fully seated and locked in place. If the condition persists, contact your service representative.
Overload  LED is on. 1 long beep every 5 seconds.	Power requirements exceed the UPS capacity (greater than 100% of nominal; see page 98 for specific output overload ranges).	Remove some of the equipment from the UPS. The UPS continues to operate, but may switch to Bypass mode if the load increases. The alarm resets when the condition becomes inactive.
Overtemperature  LED is on. 1 long beep every 5 seconds.	The UPS internal temperature is too high or a fan has failed.	Shut down the UPS. Clear vents and remove any heat sources. Allow the UPS to cool. Ensure the airflow around the UPS is not restricted. Restart the UPS. If the condition persists, contact your service representative.
Site Wiring Fault  LED is on. 1 long beep every 5 seconds.	Ground wire connection does not exist, or the line and neutral wires are reversed in the wall outlet. Input is phase to phase (neutral is not bonded to ground).	Have a qualified electrician correct the wiring. Disable the Set Site (Wiring) Fault setting (see User Settings table on page 70).
The UPS does not provide the expected backup time.	The batteries need charging or service.	Apply utility power for 48 hours to charge the batteries. If the condition persists, contact your service representative.

Alarm or Condition	Possible Cause	Action
Power is not available at the UPS output receptacles.	The UPS is in Standby mode.	Supply power to the connected equipment: Turn the UPS on by selecting MENU from the system status screen, then select CONTROL, OUTPUT CONTROL, UPS TO ONLINE, and OK to confirm.
The UPS does not start.	The main utility breaker is off.	Verify that the main utility breaker is on.
	The power cord is not connected correctly (plug-receptacle models).	Check the power cord connections.
	The electronics module is being replaced.	Complete the replacement procedure before starting the UPS, or remove the utility power.
The UPS does not turn off.	The batteries or electronics module is being replaced.	Complete the replacement procedure before shutting down the UPS.
The UPS is powered (front panel and fans are on), but some or all of the protected equipment is not on.	The equipment is not connected to the UPS correctly.	Verify that the equipment is plugged into the UPS receptacles. For hardwired models, contact a qualified electrician to check connections to the power source.
	The REPO switch is active or the REPO connector is missing.	Reset the REPO switch and restart the UPS. Verify that the REPO connector is present.
	Circuit breakers for UPS receptacles are in the OFF position.	Switch UPS receptacle circuit breakers to the ON position.
	UPS receptacles have been turned off by power management software or a communication card.	Modify the settings in the power management software or the communication card (refer to the individual user's guide).
	The UPS is in Standby mode.	Use the front panel to return the UPS to Normal mode.
Battery test failed.	The batteries need service.	Contact your service representative.
Battery test did not run.	Load was less than 10% of rated capacity when the battery test started. Battery test report shows CANCELLED, then changes to TEST SCHED during the next appropriate stage in the charging cycle.	The UPS automatically reschedules the battery test.
	User cancelled the battery test through the front panel. Battery test report shows CANCELLED.	Reschedule the battery test if necessary.
	Battery charge cycle has not completed.	Wait 48 hours.

Alarm or Condition	Possible Cause	Action
The UPS does not transfer to Bypass mode.	No input is available to the bypass input terminal block.	Check the bypass input terminal block wiring. Connect an input to the bypass input terminal block.
	The bypass utility does not qualify.	Check the bypass utility. The UPS is receiving bypass utility power that may be unstable or in brownout conditions.
	Bypass mode is disabled.	Check that the Allow Bypass user setting is Enabled (see page 70).
The UPS front panel is off, but the fans and output are on.	DIP switches on the rear panel are in the down position.	Slide one battery tray on each side of the UPS out 2 inches. Turn off utility power and wait 60 seconds. Push the DIP switches to the up position. Slide the battery trays back in. Turn on utility power. If the condition persists, contact your service representative.

Silencing the Alarm

Before silencing an alarm, check the alarm condition and perform the applicable action to resolve the condition.

Press any button on the front panel display to silence the alarm. If the alarm status changes, the alarm beeps again, overriding the previous alarm silencing.

Service and Support

If you have any questions or problems with the UPS, call your **Local Distributor** or the **Help Desk** at one of the following telephone numbers and ask for a UPS technical representative.

United States: **1-800-356-5737** or **1-919-870-3149**
Canada: **1-800-461-9166 ext 260**
All other countries: **Call your local service representative**

Please have the following information ready when you call for service:

- Model number
- Serial number
- Firmware version number
- Date of failure or problem
- Symptoms of failure or problem
- Customer return address and contact information

If repair is required, you will be given a Returned Material Authorization (RMA) Number. This number must appear on the outside of the package and on the Bill Of Lading (if applicable). Use the original packaging or request packaging from the Help Desk or distributor. Units damaged in shipment as a result of improper packaging are not covered under warranty. A replacement or repair unit will be shipped, freight prepaid for all warrantied units.



NOTE For critical applications, immediate replacement may be available. Call the **Help Desk** for the dealer or distributor nearest you.

Chapter 9 Warranty

Two-Year Limited Warranty (US and Canada)

Powerware UPS Models: 3105, 3110, 3115, 9104, 9120, 9125, 9140, and FERRUPS® up to 3.1 kVA

WARRANTOR: The warrantor for the limited warranties set forth herein is Eaton Electrical Inc., a Delaware Corporation company ("Company").

LIMITED WARRANTY: This limited warranty (this "Warranty") applies only to the original End-User (the "End-User") of any Powerware 3105, 3110, 3115, 9104, 9120, 9125, 9140, and FERRUPS up to 3.1 kVA Products (individually and collectively, the "Product") purchased on or after June 1, 2004 and cannot be transferred. This Warranty applies even in the event that the Product is initially sold by Company for resale to an End-User.

LIMITED WARRANTY PERIOD: The period covered by this Warranty for Product installed [and currently located] in the fifty (50) United States, the District of Columbia, and Canada is twenty-four (24) months from the date of purchase.

WHAT THIS LIMITED WARRANTY COVERS: The warrantor warrants that the Product and battery (individually and collectively, the "Warranted Items") are free from defects in material and workmanship. If, in the opinion of Company, a Warranted Item is defective and the defect is within the terms of this Warranty, Company's sole obligation will be to repair or replace such defective Warranted Item (including by providing service, parts and labor, as applicable), at the option of Company.

PROCEDURES FOR REPAIR OR REPLACEMENT OF WARRANTED ITEMS: The Warranted Item will be repaired or replaced at a Company site or such other location as determined by Company.

If the Warranted Item is to be replaced by Company, and the End-User supplies a credit card number or purchase order for the value of the replacement Product, Company will use commercially reasonable business efforts to ship (via standard ground shipment and at no cost to the End-User) the replacement Warranted Item to the End-User within one (1) business day after Company receives notice of the warranty claim. In such case, the End-User must return (at Company's expense) the defective Warranted Item to Company in the same packaging as the replacement Warranted Item received by the End-User or as otherwise instructed by Company. If Company does not receive the defective Warranted Item, Company will either charge the End-User's credit card, or send the End-User an invoice (which the End-User agrees to pay), for the value of the replacement Product.

If the Warranted Item is to be replaced by Company, but the End-User is unwilling or unable to supply a credit card number or purchase order for the value of the replacement Product, Company will use commercially reasonable business efforts to ship (via standard ground shipment and at no cost to the End-User) the replacement Warranted Item to the End-User within one (1) business day after Company receives the defective Product from the End-User.

In any case, Company will provide shipping instructions and will pay its designated carrier for all shipping charges for return of defective equipment and replacement of Warranted Items. Any returned Warranted Item or parts that are replaced may be new or reconditioned. All Warranted Items returned to Company and all parts replaced by Company shall become the property of Company.

WHAT THIS LIMITED WARRANTY DOES NOT COVER: This Warranty does not cover any defects or damages caused by: (a) failure to properly store the Product before installation, including the charge of batteries no later than the date indicated on the packaging; (b) shipping and delivery of the Product if shipping is FOB Factory; (c) neglect, accident, abuse, misuse, misapplication, or incorrect installation; (d) repair or alteration not authorized in writing by Company personnel or performed by an authorized Company Customer Service Engineer or Agent; (e) improper testing, operation, maintenance, adjustment, or modification of any kind not authorized in writing by Company personnel or performed by an authorized Company Customer Service Engineer or Agent; or (f) use of the Product under other than normal operating conditions or in a manner inconsistent with the Product's labels or instructions.

This Warranty is not valid if the Product's serial numbers have been removed or are illegible. Any Warranted Items repaired or replaced pursuant to this Warranty will be warranted for the remaining portion of the original Warranty subject to all the terms thereof.

Company shall not be responsible for any charges for testing, checking, removal or installation of Warranted Items.

COMPANY DOES NOT WARRANT EQUIPMENT NOT MANUFACTURED BY COMPANY. IF PERMITTED BY THE APPLICABLE MANUFACTURER, COMPANY SHALL PASS THROUGH SUCH MANUFACTURER'S WARRANTIES TO END-USER.

COMPANY DOES NOT WARRANT SOFTWARE, INCLUDING SOFTWARE EMBEDDED IN PRODUCTS, THAT IS NOT CREATED BY COMPANY. WITHOUT LIMITING THE FOREGOING, COMPANY SPECIFICALLY DOES NOT WARRANT SOFTWARE (SUCH AS LINUX) THAT WAS CREATED USING AN "OPEN SOURCE" MODEL OR IS DISTRIBUTED PURSUANT TO AN OPEN SOURCE LICENSE.

THIS WARRANTY IS THE SOLE AND EXCLUSIVE WARRANTY OFFERED BY COMPANY WITH RESPECT TO THE PRODUCTS AND SERVICES AND, EXCEPT FOR SUCH FOREGOING WARRANTY COMPANY DISCLAIMS ALL OTHER WARRANTIES INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY, TITLE, NON-INFRINGEMENT, AND FITNESS FOR A PARTICULAR PURPOSE. CORRECTION OF NON-CONFORMITIES IN THE MANNER AND FOR THE PERIOD OF TIME PROVIDED ABOVE SHALL CONSTITUTE COMPANY'S SOLE LIABILITY AND END-USER'S EXCLUSIVE REMEDY FOR FAILURE OF COMPANY TO MEET ITS WARRANTY OBLIGATIONS, WHETHER CLAIMS OF THE END-USER ARE BASED IN CONTRACT, IN TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY), OR OTHERWISE.

LIMITATION OF LIABILITY: The remedies of the End-User set forth herein are exclusive and are the sole remedies for any failure of Company to comply with its obligations hereunder. In no event shall Company be liable in contract, in tort (including negligence or strict liability) or otherwise for damage to property or equipment other than the Products, including loss of profits or revenue, loss of use of Products, loss of data, cost of capital, claims of customers of the End-User or any special, indirect, incidental or consequential damages whatsoever. The total cumulative liability of Company hereunder whether the claims are based in contract (including indemnity), in tort (including negligence or strict liability) or otherwise, shall not exceed the price of the Product on which such liability is based.

Company shall not be responsible for failure to provide service or parts due to causes beyond Company's reasonable control.

END-USER'S OBLIGATIONS: In order to receive the benefits of this Warranty, the End-User must use the Product in a normal way; follow the Product's user's guide; and protect against further damage to the Product if there is a covered defect.

OTHER LIMITATIONS: Company's obligations under this Warranty are expressly conditioned upon receipt by Company of all payments due to it (including interest charges, if any). During such time as Company has not received payment of any amount due to it for the Product, in accordance with the contract terms under which the Product is sold, Company shall have no obligation under this Warranty. Also during such time, the period of this Warranty shall continue to run and the expiration of this Warranty shall not be extended upon payment of any overdue or unpaid amounts.

COSTS NOT RELATED TO WARRANTY: The End-User shall be invoiced for, and shall pay for, all services not expressly provided for by the terms of this Warranty, including without limitation, site calls involving an inspection that determines no corrective maintenance is required. Any costs for replacement equipment, installation, materials, freight charges, travel expenses or labor of Company representatives outside the terms of this Warranty will be borne by the End-User.

OBTAINING WARRANTY SERVICE: In the USA, call the Customer Reliability Center 7x24 at 800-356-5737. Outside of the USA, call your local Powerware product sales or service representative, or call the Customer Reliability Center in the USA at 919-870-3149. For comments or questions about this Warranty, write to the Customer Quality Representative, 3301 Spring Forest Road, Raleigh, North Carolina 27616 USA.

Ten-Year Pro-Rated Limited Warranty (US and Canada)

Powerware UPS Models: 5115, 5125, 5140, 9104, 9120, 9125, 9140, 9155, 9170+, and FERRUPS

WARRANTOR: The warrantor for the limited warranties set forth herein is Eaton Electrical Inc., a Delaware Corporation company ("Company").

LIMITED WARRANTY: This pro-rated limited warranty (this "Warranty") applies only to the original End-User (the "End-User") of any Powerware 5115, 5125, 5140, 9104, 9120, 9125, 9140, 9155, 9170+, and FERRUPS Products (individually and collectively, the "Product") and cannot be transferred. This Warranty applies even in the event that the Product is initially sold by Company for resale to an End-User.

WHAT THIS WARRANTY COVERS: In addition to the standard Two-Year Limited Warranty covering the applicable Product, the warrantor warrants that the Product will have a service life (defined below) of ten years from the date of purchase (the "Ten-Year Service Life") when used in accordance with the storage, handling, installation, operation and maintenance procedures prescribed in the Product's user's guide. "Service life" means the Product's ability to deliver at least 80% of its original rated backup time.

If Company finds, in its sole discretion, that any Product has not provided the Ten-Year Service Life, Company will, as its sole obligation and the End-User's sole remedy for Company's breach of this warranty, repair or replace the Product, at its option, F.O.B. Company's factory, for a charge, payable by the End-User to Company pro-rated on the following basis:

The End-User will be allowed a credit against Company's list price of equivalent equipment at the time of return of the Product to Company, in proportion to the percentage of Ten-Year Service Life remaining at the time of return of the Product to Company. In calculating the available credit, the remaining portion of the Ten-Year Service Life will be rounded up or down to the nearest whole year. The End-User will assume responsibility to pay the balance of the list price; and Company reserves the right to require payment prior to delivery of the repaired or replacement equipment.

For the avoidance of doubt, Company's responsibilities under this Warranty are as follows:

Years 1-2 - Product repaired or replaced pursuant to terms of Limited Warranty

Years 3-10 - Unit Credit (\$) = Current List Price $\times$ $\frac{\text{Years of Unexpired Life}}{10 \text{ Years of Warranted Life}}$

WHAT THIS LIMITED WARRANTY DOES NOT COVER: This Warranty does not cover any defects or damages caused by: (a) failure to properly store the Product before installation, including the charge of batteries no later than the date indicated on the packaging; (b) shipping and delivery of the Product if shipping is FOB Factory; (c) neglect, accident, abuse, misuse, misapplication, or incorrect installation; (d) repair or alteration not authorized in writing by Company personnel or performed by an authorized Company Customer Service Engineer or Agent; (e) improper testing, operation, maintenance, adjustment, or modification of any kind not authorized in writing by Company personnel or performed by an authorized Company Customer Service Engineer or Agent; or (f) use of the Product under other than normal operating conditions or in a manner inconsistent with the Product's labels or instructions.

This Warranty is not valid: (a) unless the End-User returns to Company the Warranty Registration Card within thirty (30) days of purchase; or (b) if the Product's serial numbers have been removed or are illegible. Any Warranted Items repaired or replaced pursuant to this Warranty will be warranted for the remaining portion of the original Warranty subject to all the terms thereof.

Company shall not be responsible for any charges for testing, checking, removal or installation of Warranted Items.

COMPANY DOES NOT WARRANT EQUIPMENT NOT MANUFACTURED BY COMPANY. IF PERMITTED BY THE APPLICABLE MANUFACTURER, COMPANY SHALL PASS THROUGH SUCH MANUFACTURER'S WARRANTIES TO END-USER.

COMPANY DOES NOT WARRANT SOFTWARE, INCLUDING SOFTWARE EMBEDDED IN PRODUCTS, THAT IS NOT CREATED BY COMPANY. WITHOUT LIMITING THE FOREGOING, COMPANY SPECIFICALLY DOES NOT WARRANT SOFTWARE (SUCH AS LINUX) THAT WAS CREATED USING AN "OPEN SOURCE" MODEL OR IS DISTRIBUTED PURSUANT TO AN OPEN SOURCE LICENSE.

THIS WARRANTY IS THE SOLE AND EXCLUSIVE WARRANTY OFFERED BY COMPANY WITH RESPECT TO THE PRODUCTS AND SERVICES AND, EXCEPT FOR SUCH FOREGOING WARRANTY COMPANY DISCLAIMS ALL OTHER WARRANTIES INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY, TITLE, NON-INFRINGEMENT, AND FITNESS FOR A PARTICULAR PURPOSE. CORRECTION OF NON-CONFORMITIES IN THE MANNER AND FOR THE PERIOD OF TIME PROVIDED ABOVE SHALL CONSTITUTE COMPANY'S SOLE LIABILITY AND END-USER'S EXCLUSIVE REMEDY FOR FAILURE OF COMPANY TO MEET ITS WARRANTY OBLIGATIONS, WHETHER CLAIMS OF THE END-USER ARE BASED IN CONTRACT, IN TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY), OR OTHERWISE.

LIMITATION OF LIABILITY: The remedies of the End-User set forth herein are exclusive and are the sole remedies for any failure of Company to comply with its obligations hereunder. In no event shall Company be liable in contract, in tort (including negligence or strict liability) or otherwise for damage to property or equipment other than the Products, including loss of profits or revenue, loss of use of Products, loss of data, cost of capital, claims of customers of the End-User or any special, indirect, incidental or consequential damages whatsoever. The total cumulative liability of Company hereunder whether the claims are based in contract (including indemnity), in tort (including negligence or strict liability) or otherwise, shall not exceed the price of the Product on which such liability is based.

Company shall not be responsible for failure to provide service or parts due to causes beyond Company's reasonable control.

END-USER'S OBLIGATIONS: In order to receive the benefits of this Warranty, the End-User must use the Product in a normal way; follow the Product's operation and maintenance manual; and protect against further damage to the Product if there is a covered defect.

OTHER LIMITATIONS: Company's obligations under this Warranty are expressly conditioned upon receipt by Company of all payments due to it (including interest charges, if any). During such time as Company has not received payment of any amount due to it for the Product, in accordance with the contract terms under which the Product is sold, Company shall have no obligation under this Warranty. Also during such time, the period of this Warranty shall continue to run and the expiration of this Warranty shall not be extended upon payment of any overdue or unpaid amounts.

COSTS NOT RELATED TO WARRANTY: The End-User shall be invoiced for, and shall pay for, all services not expressly provided for by the terms of this Warranty, including without limitation, site calls involving an inspection that determines no corrective maintenance is required. Any costs for replacement equipment, installation, materials, freight charges, travel expenses or labor of Company representatives outside the terms of this Warranty will be borne by the End-User.

OBTAINING WARRANTY SERVICE: In the USA, call the Customer Reliability Center 7x24 at 800-356-5737. Outside of the USA, contact your local Powerware product sales or service representative, or call the Customer Reliability Center in the USA at 919-870-3149. Company will not accept any Product for return, credit or exchange unless expressly authorized by Company in writing and delivered FOB Company factory. For comments or questions about this Warranty, write to the Customer Quality Representative, 3301 Spring Forest Road, Raleigh, North Carolina 27616 USA.

Load Protection Guarantee (US and Canada)

Powerware UPS Models 3105, 3110, 3115, 5110, 5115, 5125, 9120, 9125, 9140, 9150, 9155, 9170+, and FERRUPS

GUARANTOR: The Guarantor for the load protection guaranty set forth herein is Eaton Electrical Inc., a Delaware Corporation company ("Company").

LIMITED GUARANTY: This load protection guaranty (this "Guaranty") applies only to the original End-User (the "End-User") of any Powerware 3105, 3110, 3115, 5110, 5115, 5125, 9120, 9125, 9140, 9150, 9155, 9170+, and FERRUPS Products (individually and collectively, the "Product") and cannot be transferred. This Guaranty applies even in the event that the Product is initially sold by Company for resale to an End-User.

WHAT THIS GUARANTY COVERS: For the lifetime of the Product, Guarantor promises to repair or replace, at Guarantor's option, the equipment (valued up to the limits shown below*) that is damaged by an AC power line surge, spike, or other transient when properly connected to Guarantor's uninterruptible power system ("UPS"). Reimbursement for or restoration of data loss excluded. This Guaranty applies only if all of the following circumstances arise:

1. The UPS is plugged into properly grounded and wired outlets, using no extension cords, adapters, other ground wires or other electrical connectors;
2. The installation of the UPS complies with all applicable electrical and safety codes described by the National Electric Code (NEC);
3. The UPS was used under normal operating conditions and in accordance with all labels and instructions; and
4. The UPS was not damaged by accident (other than AC power line transient), misuse, or abuse.

***Cumulative Limits to be paid by Guarantor under this Load Protection Guaranty:**

- \$25,000 for Powerware UPS Models 3105, 3110, and 3115
- \$150,000 for Powerware UPS Models 5110, 5115, and 5125
- \$250,000 for Powerware UPS Models 9120, 9125, 9140, 9150, 9155, 9170+, and FERRUPS products

WHAT THIS GUARANTY DOES NOT COVER: Any reimbursement or repair to End-User's equipment does not include reimbursement for or restoration of any data loss. This Guaranty does not cover any defects or damages caused by: (a) failure to properly store the Product before installation, including the charge of batteries no later than the date indicated on the packaging; (b) shipping and delivery of the Product if shipping is FOB Factory; (c) neglect, accident, abuse, misuse, misapplication, or incorrect installation of Product; (d) repair or alteration of Product not authorized in writing by Company personnel or performed by an authorized Company Customer Service Engineer or Agent; (e) improper testing, operation, maintenance, adjustment, or modification of any kind to the Product not authorized in writing by Company personnel or performed by an authorized Company Customer Service Engineer or Agent; or (f) use of the Product under other than normal operating conditions or in a manner inconsistent with the Product's labels or instructions.

This Guaranty is not valid: (a) unless the End-User returns to Company the Warranty Registration Card within thirty (30) days of purchase; or (b) if the Product's serial numbers have been removed or are illegible.

Company shall not be responsible for any charges for testing, checking, removal or installation of any items.

LIMITATION OF LIABILITY: THE REMEDIES OF THE END-USER SET FORTH HEREIN ARE EXCLUSIVE AND ARE THE SOLE REMEDIES FOR ANY FAILURE OF COMPANY TO COMPLY WITH ITS OBLIGATIONS HEREUNDER. EXCEPT AS OTHERWISE PROVIDED FOR IN THIS GUARANTY, IN NO EVENT SHALL COMPANY BE LIABLE IN CONTRACT, IN TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY) OR OTHERWISE FOR DAMAGE TO PROPERTY OR EQUIPMENT OTHER THAN THE PRODUCTS, INCLUDING LOSS OF PROFITS OR REVENUE, LOSS OF USE OF PRODUCTS, LOSS OF DATA, COST OF CAPITAL, CLAIMS OF CUSTOMERS OF THE END-USER OR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES WHATSOEVER. THE TOTAL CUMULATIVE LIABILITY OF COMPANY HEREUNDER WHETHER THE CLAIMS ARE BASED IN CONTRACT (INCLUDING INDEMNITY), IN TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY) OR OTHERWISE, SHALL NOT EXCEED THOSE SET FORTH ABOVE.

Company shall not be responsible for failure to provide repair or replacement under this Guaranty due to causes beyond Company's reasonable control.

END-USER'S OBLIGATIONS: In order to receive the benefits of this Guaranty, the End-User must use the Product in a normal way; follow the Product's operation and maintenance manual; and protect against further damage to the Product if there is a covered defect.

OTHER LIMITATIONS: Company's obligations under this Guaranty are expressly conditioned upon receipt by Company of all payments due to it (including interest charges, if any). During such time as Company has not received payment of any amount due to it for the Product, in accordance with the contract terms under which the Product is sold, Company shall have no obligation under this Guaranty.

COSTS NOT RELATED TO GUARANTY: The End-User shall be invoiced for, and shall pay for, all services not expressly provided for by the terms of this Guaranty, including without limitation, site calls involving an inspection that determines no corrective maintenance is required. Any costs for replacement equipment, installation, materials, freight charges, travel expenses or labor of Company representatives outside the terms of this Guaranty will be borne by the End-User.

TO MAKE A CLAIM: In the USA, call the Customer Reliability Center 7x24 at 800-356-5737. Outside of the USA, contact your local Powerware product sales or service representative, or call the Customer Reliability Center in the USA at 919-870-3149. For comments or questions about this Load Protection Guaranty, write to the Customer Quality Representative, 3301 Spring Forest Road, Raleigh, North Carolina 27616 USA.



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