Eaton® 9355 UPS

10/15 kVA
User's Guide

Powering Business Worldwide

p/n: 164201594
Revision L0

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 respect et outes les exigences du Reglement sur le matériel brouilleur du Canada.

IEC 62040-2

Some configurations are classified under IEC 62040-2 as "C2 UPS for Unrestricted Sales Distribution."

IMPORTANT

To ensure you have the most up-to-date content and information for this product, please review the latest manual revision on our website, www.eaton.com/9355.

EATON® and Powering Business Worldwide™ are trademarks of Eaton.

Powering Business Worldwide™

P-110000654-001 Revised: December 21st, 2018

EATON
END-USER LICENSE AGREEMENT

IMPORTANT, READ CAREFULLY. THIS END USER LICENSE AGREEMENT (THE "AGREEMENT") IS A BINDING CONTRACT BETWEEN YOU, THE END-USER (THE "LICENSEE") AND EATON INTELLIGENT POWER LIMITED, IRELAND, OR ONE OF ITS AFFILIATES ("EATON" OR "LICENSOR"). BY OPERATING THIS UNINTERRUPTIBLE POWER SUPPLY (UPS) PRODUCT INCLUDING SOFTWARE EMBEDDED IN IT (FIRMWARE), YOU, THE LICENSEE, ARE AGREEING TO BE BOUND BY THE TERMS, CONDITIONS, AND LIMITATIONS OF THIS AGREEMENT. READ THE TERMS AND CONDITIONS OF THIS AGREEMENT CAREFULLY BEFORE, INSTALLING OR OPERATING THE PRODUCT. IF YOU DO NOT AGREE TO THE TERMS OF THIS AGREEMENT, PROMPTLY RETURN THE UNUSED PRODUCT TO EATON.

1.0 DEFINITIONS

1.1 Documentation. "*Documentation*" means the user guides and manuals for the installation and use of the UPS, whether made available over the internet, provided in CD-ROM, DVD, hard copy or other form.

1.2 Firmware. "*Firmware*" means software programs that are embedded in the product for which Licensee is granted a license hereunder, the Documentation therefore and, to the extent available, Updates thereto. The Firmware is licensed hereunder in object code (machine-readable) form only except that certain software programs may include limited portions in source code (human-readable) form.

1.3 Update. "*Update*" means a subsequent release of the Firmware, if and when developed by Eaton. An Update does not include any release, new version, option, or future product, which Eaton licenses separately.

2.0 FIRMWARE LICENSE

2.1 Ownership. Eaton or its third party licensors retains all title, copyright and other proprietary rights in, and ownership of the Firmware regardless of the media upon which the original or any copy may be recorded or fixed.

2.2 License Grant. Eaton grants to Licensee a limited, revocable, non-exclusive, non-assignable license to use the Firmware in conjunction with the operation of the product to which the Firmware pertains or other products as described by Eaton in the Documentation. Licensee does not acquire any rights, express or implied, other than those expressly granted in this Agreement.

2.3 Restrictions and Requirements. Licensee will not, nor will it permit others to, modify, adapt, translate, reverse engineer, decompile, or disassemble the Firmware or any component thereof (including the Documentation), or create derivative works based on the Firmware (including the Documentation), except to the extent such foregoing restriction is prohibited by applicable law or applicable open source license to, and only to, any open source software component that is incorporated into the Firmware (if any). Copyright laws and international treaties protect the Firmware, including the Documentation. Unauthorized copying of the Firmware, the Documentation or any part thereof, is expressly prohibited. For avoidance of doubt, Eaton does not grant Licensee a license to any of Eaton's brands, logos, designs, trade dress, service marks, trademarks, domain names or trade names, in whole or in part.

Licensee agrees to install or allow installation of all corrections of substantial defects, security patches, minor bug fixes and updates, including any enhancements, for the Firmware in accordance with the instructions and as directed by Eaton.

2.4 Transfer and Assignment Restrictions. Licensee will not sell, resell, assign, lease, sublicense, encumber, or otherwise transfer its interest in this Agreement or in the Firmware, or the Documentation in whole or in part, or allow any other person or entity, including any parent or subsidiary of Licensee or other subsidiary of Licensee's parent, to copy, distribute, or otherwise transfer the Firmware without the prior written consent of Eaton. Licensee may transfer the Firmware directly to a third party only in connection with the sale of the Eaton product in which it is installed.

3.0 TERMINATION

3.1 Termination. This Agreement and the license granted hereunder automatically terminates if Licensee breaches any provision of this Agreement. Eaton may terminate this license at any time with or without cause.

3.2 Effect of Termination. Immediately upon termination of this Agreement or the license granted hereunder, Licensee will cease using the product. The parties' rights and obligations under the following sections of this Agreement will survive termination of this Agreement: Article 1.0, Section 2.1, Section 2.3, Section 2.4, Article 3.0, Article 4.0 and Article 5.0.

4.0 INFRINGEMENT AND WARRANTIES

4.1 Infringement. If Licensee learns of a threat, demand, allegation, or indication that the UPS with its firmware infringes or misappropriates any third party intellectual property rights (including but not limited to any patent, copyright, trademark, trade dress, or trade secret) ("Intellectual Property Claim"), Licensee will notify Eaton promptly of such claim. Eaton may, in its sole discretion, elect to assume sole control of the defense and settlement of said Intellectual Property Claim and Licensee will provide reasonable information and assistance to Eaton for the defense of such claim.

4.2 Disclaimer of Warranties. THE FIRMWARE IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, . EATON DOES NOT WARRANT THAT THE FIRMWARE WILL BE ERROR-FREE OR SECURE FROM UNAUTHORIZED ACCESS. THE LICENSEE EXPRESSLY ACKNOWLEDGES THAT TO THE EXTENT PERMITTED BY APPLICABLE LAW, THE USE OF THE PRODUCT IS AT LICENSEE'S SOLE RISK.

5.0 GENERAL PROVISIONS

5.1 Update Policy. Eaton may from time to time, but has no obligation to, create Updates of the Firmware or components thereof.

5.2 Limitation on Liability. NOTWITHSTANDING ANY PROVISION OF THIS AGREEMENT TO THE CONTRARY, LICENSEE EXPRESSLY UNDERSTANDS AND AGREES THAT EATON, ITS AFFILIATES, AND ITS LICENSORS, WILL NOT BE LIABLE FOR: (A) ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, CONSEQUENTIAL OR EXEMPLARY DAMAGES WHICH MAY BE INCURRED BY LICENSEE OR ANY THIRD PARTY, HOWEVER CAUSED AND UNDER ANY THEORY OF LIABILITY. THIS WILL INCLUDE, BUT NOT BE LIMITED TO, ANY LOSS OF PROFIT (WHETHER INCURRED DIRECTLY OR INDIRECTLY), ANY LOSS OF GOODWILL OR BUSINESS REPUTATION, ANY LOSS OF DATA SUFFERED, COST OF PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES, OR OTHER INTANGIBLE LOSS; (B) ANY LOSS OR DAMAGE WHICH MAY BE INCURRED BY LICENSEE OR ANY THIRD PARTY. THESE LIMITATIONS ON EATON'S LIABILITY WILL APPLY WHETHER OR NOT EATON HAS BEEN ADVISED OF OR SHOULD HAVE BEEN AWARE OF THE POSSIBILITY OF ANY SUCH LOSSES ARISING.

TO THE EXTENT PERMITTED BY LAW, THE TOTAL LIABILITY OF EATON, ITS AFFILIATES, AND ITS LICENSORS, FOR ANY CLAIMS UNDER THESE TERMS, INCLUDING FOR ANY IMPLIED WARRANTIES, IS LIMITED TO THE AMOUNT PAID FOR THE UPS.

THIS SECTION 5.2 STATES EATON'S ENTIRE LIABILITY AND LICENSEE'S SOLE AND EXCLUSIVE REMEDY UNDER THIS AGREEMENT, AND IS SUBJECT TO ALL LIMITATIONS STATED IN SECTION 4.2.

5.3 Notices. All notices required to be sent hereunder will be in writing and will be deemed to have been given when mailed by first class mail to the address shown below:

LICENSE NOTICES:
Eaton Intelligent Power Limited
Eaton House,
30 Pembroke Road,
Dublin 4,
D04 Y0C2,
Ireland

5.4 Severability. If any provision of this Agreement is held to be invalid or unenforceable, the remaining provisions of this Agreement will remain in full force.

5.5 Waiver. The waiver by either party of any default or breach of this Agreement will not constitute a waiver of any other or subsequent default or breach. Failure to enforce or delay in enforcing any provision of this Agreement will not constitute a waiver of any rights under any provisions of this Agreement.

5.6 Entire Agreement. This Agreement constitutes the complete agreement between the parties and supersedes all prior or contemporaneous agreements or representations, written or oral, concerning the subject matter of this Agreement. This Agreement may not be modified or amended except in a writing specifically referencing this Agreement and signed by a duly authorized representative of each party. No other act, document, usage or custom will be deemed to amend or modify this Agreement. The Firmware, or portions thereof, may also be subject to additional paper or electronic license agreements. In such cases, the terms of this Agreement will be supplemental to those in the additional agreements, to the extent not inconsistent with the additional agreements. If a copy of this Agreement in a language other than English is included with the Firmware or Documentation, it is included for convenience and the English language version of this Agreement will control.

5.7 Heirs, Successors, and Assigns. Each and all of the covenants, terms, provisions and agreements herein contained will be binding upon and inure to the benefit of the parties hereto and, to the extent expressly permitted by this Agreement, their respective heirs, legal representatives, successors and assigns.

5.8 Export Restrictions. Licensee agrees to comply fully with all relevant export laws and regulations of the United States and all other countries in the world (the "Export Laws") to assure that neither the Firmware nor any direct product thereof are (I) exported, directly or indirectly, in violation of Export Laws; or (ii) are intended to be used for any purposes prohibited by the Export Laws. Without limiting the foregoing, Licensee will not export or re-export the Firmware: (i) to any country to which the U.S. has embargoed or restricted the export of goods or services (see http://www.treasury.gov/resource-center/sanctions/Programs/Pages/Programs.aspx), or to any national of any such country, wherever located, who intends to transmit or transport the Firmware back to such country; (ii) to any end user who Licensee knows or has reason to know will utilize the Firmware in the design, development or production of nuclear, chemical or biological weapons; or (iii) to any end-user who has been prohibited from participating in U.S. export transactions by any federal agency of the U.S. government.

5.9 U.S. Government Restricted Rights. The Firmware is a "commercial item" as that term is defined at 48 C.F.R. § 2.101, consisting of "commercial computer software" and "commercial computer software documentation", as such terms are used in 48 C.F.R. § 12.212, and is provided to the U.S. Government only as a commercial end item. Consistent with 48 C.F.R. § 12.212 and 48 C.F.R. §§ 227.7202-1 through 227.7202-4, all U.S. Government End Users acquire the Firmware with only those rights set forth herein. Contractor/manufacturer is Eaton Corporation, 1000 Eaton Boulevard, Cleveland, Ohio 44122.

5.10 Third Party Intellectual Property Rights. The Firmware may contain components (including open source software components) that are owned by third parties ("Third Party Licensors") and are provided with, incorporated into, or embedded in, the Firmware pursuant to license arrangements between Eaton and such third parties. Third Party Licensor components in the Firmware are not licensed or warranted under the terms of this document, but are instead subject to the Third Party Licensors' license agreements. Licensee will not modify, delete, or obfuscate any copyright or other proprietary rights notices of Third Party Licensors contained in the Firmware.

5.11 Indemnity. Licensee shall defend, indemnify and hold Eaton and its officers, directors, employees, and agents harmless from and against all losses, damages, liabilities, claims, actions, and associated costs and expenses (including reasonable attorneys' fees and expenses) by reason of injury or death to any person or damage to any tangible or intangible property arising or resulting from the negligence or willful misconduct of the Licensee, its employees, contractors, or agents, in connection with Licensee's use of Firmware and Documentation.

Licensee shall be responsible for any breach of this Agreement by its officers, directors, employees, contractors, or agents. Licensee shall defend, indemnify, and hold Eaton and its officers, directors, employees, and agents harmless from and against any and all losses, damages, liabilities, claims, actions, and associated costs and expenses (including reasonable attorneys' fees and expenses) arising out of or in connection with any breach of this Agreement.

5.12 Open Source Software. The Firmware may contain certain components owned by Eaton that are provided with, incorporated into, linked to, or embedded in the Firmware that are subject to third party open source licenses ("Eaton Open Source Components"). Eaton Open Source Components are subject to the open source licenses corresponding to the particular software component. To the extent there are any conflicts between the terms of this Agreement and any open source license corresponding to Eaton Open Source Components or additional obligations by such open sources license that are not set forth in this Agreement, the terms of the open source license will control.

5.13 Confidentiality. Licensee acknowledges that confidential aspects of the Firmware (including any proprietary source code) are a trade secret of Eaton, the disclosure of which would cause substantial harm to Eaton that could not be remedied by the payment of damages alone and such confidential aspects of the Firmware shall not be disclosed to third parties without the prior written consent of Eaton. Accordingly, Eaton will be entitled to preliminary and permanent injunctive and other equitable relief for any breach of this Section 5.13.

5.14 Note on JAVA Support. The Firmware may contain support for programs written in JAVA. JAVA technology is not fault tolerant and is not designed, manufactured, or intended for use or resale as online control equipment in hazardous environments requiring fail-safe performance, such as in the operation of nuclear facilities, aircraft navigation or communications systems, air traffic control, direct life support machines, or weapons systems, in which the failure of JAVA technology could lead directly to death, personal injury, or severe physical or environmental damage. EATON DISCLAIMS ALL DAMAGES INCLUDING DIRECT, INDIRECT AND CONSEQUENTIAL DAMAGES RELATING TO THE FAILURE OF ANY SOFTWARE INCLUDING JAVA PROGRAMS AND/OR JAVA TECHNOLOGY.

5.15 Governing Law. This Agreement will be interpreted and enforced in accordance with the laws of Ireland, without regard to choice of law principles. Any claim or suit with respect to this Agreement shall be brought in the Courts of Ireland, unless mandatory law imposes otherwise.

Table of Contents

List of Figures

List of Tables

Chapter 1 Introduction

The Eaton® 9355 UPS uninterruptible power supply (UPS) is a true online, double-conversion three-phase system that can be used to prevent loss of valuable electronic information and minimize equipment downtime. It is ideal for protecting essential information technology and electrical engineering infrastructure in corporate, telecom, health care, banking, and industrial applications.

The Eaton 9355 UPS continually monitors incoming electrical power and removes the surges, spikes, sags, and other irregularities that are inherent in commercial utility power. Working with a building's electrical system, the UPS supplies clean, consistent power that sensitive electronic equipment requires for reliable operation. During brownouts, blackouts, and other power interruptions, batteries provide emergency power to safeguard operation.

With the Eaton 9355 UPS, you can safely eliminate the effects of electrical line disturbances and guard the integrity of your systems and equipment. Figure 1 shows the Eaton 9355 UPS and an optional Extended Battery Module (EBM).

IMPORTANT

Startup and operational checks must be performed by an authorized Eaton Customer Service Engineer, or the warranty terms specified on the product's resources page become void. See Chapter 11 *Warranty* for details. This service is offered as part of the sales contract for the UPS. Contact an Eaton service representative in advance (a minimum two-week notice is required) to reserve a preferred startup date.

Figure 1. The Eaton 9355 UPS and EBM (3-High Cabinets Shown)

9355 UPS 9355 EBM

Providing outstanding performance and reliability, the Eaton 9355 UPS's unique benefits including the following:

- Online UPS design with pure sine wave output. The UPS filters and regulates incoming AC power and provides consistent power to your equipment without draining the battery.
- More wattage in less space with a 0.9 power factor–protecting more equipment and leaving more room for expansion.
- Support for Powerware Hot Sync paralleling of multiple modules for redundancy or extra capacity.

- Input current total harmonic distortion (THD) of less than five percent, using active input power factor correction.
- 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.
- Up to three hours of extended runtime with added EBMs.
- Advanced power management software, providing tools to monitor and manage power devices on your network, is available via the Eaton website, www.Eaton.com/downloads.
- Emergency shutdown control through the remote emergency power-off (REPO) port.
- Start-on-battery capability for powering up the UPS even if utility power is not available.
- Standard communication options with a DB-9 serial port, relay output contacts, and programmable signal inputs.
- Optional X-Slot® cards with enhanced communication capabilities for increased power protection and control.

1.1 UPS Standard Features

The UPS has many standard features that provide cost-effective and consistently reliable power protection. The descriptions in this section provide a brief overview of the UPS standard features.

1.1.1 Control Panel

The control panel, located on the front of the UPS, has a four-button graphical LCD with backlight. It provides useful information about the UPS itself, load status, events, measurements, and settings.

See Chapter 7 *UPS Operating Instructions* for additional information.

1.1.2 Customer Interface

- **Building Alarm Monitoring** – Up to four inputs in the UPS are available to connect the facility's alarm system contacts. Some system configurations may limit the number of inputs available. The UPS uses these inputs to monitor the building alarms in addition to the UPS status.
- **X-Slot Communication Bays** – Two communication bays are standard equipment. Up to two communication cards can be installed in the UPS at any time.

For additional information on these topics, see Chapter 6 *Communication*.

1.1.3 Advanced Battery Management

Advanced Battery Management (ABM) technology uses sophisticated sensing circuitry and a three-stage charger. The charger is a high-frequency, IGBT-based power conversion stage that extends the useful service life of UPS batteries by isolating the battery from the electrical environment, except for periodic charging or reserve mode operation. ABM also protects batteries from damage due to high current charging and inverter ripple currents. Charging at high currents can overheat and damage batteries.

ABM extends battery life by keeping the batteries charged and performing periodic battery testing. The battery test checks the batteries by transferring to battery mode. During the test the battery voltage is constantly monitored to determine Battery Health. ABM is intended for VRLA style batteries.

An ABM charging cycle starts with the charger driving the battery voltage at maximum current limit, to a battery charge level of 2.30volts/cell. The time it takes for the voltage to reach the battery charge level is saved as the battery charge time. If the battery charge time exceeds 24 hours, an alarm sounds.

When the battery reaches the float level, the battery is charged at the float level for 48 hours. Due to charger capability, some battery cabinet configurations extend float level to 72 hours. Twenty-four hours into the float period, a series of battery tests are performed to check the battery health. The float level charge continues after a successful test.

After initial startup, the battery run time on the front panel display indicates two minutes. After the 24-hour float charging period and automated battery testing, the actual battery run time is determined and the actual battery run time is displayed.

After the float period is completed, the charger is disconnected and the batteries are allowed to rest for up to 672 hours (28 days) maximum rest time. If the battery voltage falls below the opportunity charge level of 2.1V/cell during the first 240 hours (10 days) of the rest period, an alarm sounds.

An ABM charge cycle is initiated whenever one of these four conditions occurs since the last charge cycle:

- The batteries have rested over the maximum rest time of 672 hours.
- Accumulated discharge time is over a maximum battery discharge time of 20 seconds.
- Battery voltage is under the opportunity charge level of 2.1 volts/cell and the cabinet has been in rest mode for longer than 240 hours.
- A Battery Test command has been initiated.

1.2 Options and Accessories

Contact an Eaton sales representative for information about the following options.

1.2.1 Extended Battery Module (EBM)

Battery backup protection with additional runtime can be provide by equipping the UPS system with up to four Extended Battery Modules (EBMs) containing sealed lead-acid, maintenance-free batteries. The EBMs are housed in single, free-standing cabinets designed for line-up-and-match installation, but may be installed separate from the UPS cabinet. An external battery disconnect switch or tie point must be used when three or four EBMs are located separate from the UPS cabinet. The EBMs may be installed on either the right or left side of the UPS cabinet. The recommended installation location for adjacent battery cabinets is on the right side of the UPS cabinet.

1.2.2 Parallel System

Up to four 9355 UPSs can be paralleled for either redundancy or extra capacity using Eaton's patented Powerware Hot Sync paralleling technology. Powerware Hot Sync also enables wireless paralleling in the event of a communications failure, providing the industry's only truly redundant paralleling solution.

1.2.3 Monitoring and Communication

X-Slot Cards – Optional X-Slot cards support several protocols, such as SNMP, SMTP, HTTP, Modbus®, and TCP/IP. See Chapter 6 *Communication*, for additional information on monitoring and communication features.

Remote Monitoring Device (RMD) – An optional RMD contains a touch screen status display and a local audible alarm, allowing monitoring of the operational status and alarm condition of the UPS from virtually any location within the facility, up to 300 feet from the UPS.

Refer to the ***Eaton Remote Monitoring Device (RMD) Installation and Operation Manual***, listed in paragraph 1.7 *For More Information*, for additional information.

PredictPulse™ Remote Monitoring and Management Service – PredictPulse is a subscription monitoring and management service from Eaton that collects and analyzes data from connected power infrastructure devices, providing us with the insight needed to make recommendations and take action on your behalf. It's also powered by CA Technologies, bringing together the best in hardware and software. Like a second set of eyes on your power infrastructure, PredictPulse provides 24/7 remote monitoring of alarms and system performance (load, temperature/humidity, battery health, energy savings and service level) to reduce downtime risk and expedite repairs. PredictPulse also shares real-time status and trend information via an online dashboard and smartphone mobile app (Apple and Android), giving subscribers insights about past and current performance, a list of all active alarms, and asset management data (i.e., battery date codes, last and next scheduled service dates, firmware versions). The service notifies customers of critical alarms, supports remote diagnostics, and facilitates smart dispatch of technicians. PredictPulse requires a Gigabit Industrial Gateway

Card X-Slot (INDGW-X2) connectivity card in an X-Slot communication bay and an Environmental Monitoring Probe (EMP) for battery temperature/humidity monitoring. See Chapter 6 *Communication*, for additional information.

1.3 Battery System

The battery system provides emergency short-term backup power to safeguard operation during brownouts, blackouts, and other power interruptions.

1.3.1 Battery Configurations

The 9355 UPS battery system can be internal to the UPS cabinet, an Extended Battery Module/s (EBM)s, or a combination of both. The EBMs are connected in parallel with the internal batteries to provide extended run time. The battery system is equipped with sealed lead-acid, maintenance-free batteries.

An external battery disconnect switch or tie point must be used when battery systems are located separate from the UPS cabinet and wiring exceeds the number of battery terminals available.

A supplemental 48 Vdc shunt trip signal for the battery disconnect device is provided by the UPS, but is not required for normal operation.

1.4 Using This Manual

This manual describes how to install and operate the Eaton 9355 UPS. Read and understand the procedures described in this manual to ensure trouble-free installation and operation. In particular, be thoroughly familiar with the REPO procedure or the LOAD OFF procedure, see **Chapter 7 *UPS Operating Instructions***.

The information in this manual is divided into sections and chapters. The system, options, and accessories being installed dictate which parts of this manual should be read. At a minimum, **Chapter 1 *Introduction*** through **Chapter 4 *UPS System Installation*** and **Chapter 7 *UPS Operating Instructions*** should be examined.

Read through each procedure before beginning the work. Perform only those procedures that apply to the UPS system being installed or operated.

1.5 Conventions Used in This Manual

This manual uses these type conventions:

- **Bold type** highlights important concepts in discussions, key terms in procedures, and menu options, or represents a command or option that you type or enter at a prompt.
- Italic type highlights notes and new terms where they are defined.
- `Screen type` represents information that appears on the screen or LCD.

Icon	Description
Note	Information notes call attention to important features or instructions.
[Keys]	Brackets are used when referring to a specific key, such as [Enter] or [Ctrl].

In this manual, the term UPS refers only to the UPS cabinet and its internal elements. The term UPS system refers to the entire power protection system – the UPS cabinet, an external battery system, and options or accessories installed.

The term line-up-and-match refers to accessory cabinets that are physically located adjacent to the UPS. The term standalone refers to accessory cabinets that are located separate from the UPS.

Left and right side notations are referenced standing in front of the cabinet.

1.6 Symbols, Controls, and Indicators

The following are examples of symbols used on the product to alert you to important information:

RISK OF ELECTRIC SHOCK - Observe the warning associated with the risk of electric shock symbol.

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 product in the trash. This product 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.

ON - Indicates that the switch is in the ON position.

OFF - Indicates that the switch is in the OFF position.

PHASE - The word “phase.”

1.7 For More Information

Refer to the ***Eaton 9355 Parallel UPS 10/15 kVA User's Guide*** for the following additional information:

- Installation instructions, including site preparation, planning for installation, wiring and safety information, and detailed illustrations of cabinets with dimensional and connection point drawings
- Operation, including breakers, standard features and optional accessories, procedures for using the bypass functions, and information about maintenance

Refer to the ***Eaton Remote Monitoring Device (RMD) Installation and Operation Manual*** for additional installation and operating instructions.

- Visit www.eaton.com/powerquality or contact an Eaton service representative for information on how to obtain copies of these manuals.

1.8 Getting Help

If help is needed with any of the following:

- Scheduling initial startup
- Regional locations and telephone numbers
- A question about any of the information in this manual
- A question this manual does not answer

Please call the Customer Reliability Center at:

United States:	**1-800-843-9433**
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

Please use the following e-mail address for manual comments, suggestions, or to report an error in this manual:

E-ESSDocumentation@eaton.com

1.9 Equipment Registration

Please visit www.eaton.com/pq/register to register your new Eaton UPS / Eaton UPS Accessory.

Model Number: _____

Serial Number: _____

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 UPS output may carry live voltage even when the UPS is not connected to an AC supply.
- 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).
- To reduce the risk of fire, connect only to a circuit provided with 100 amperes maximum branch circuit overcurrent protection in accordance with the National Electrical Code® (NEC®), ANSI/NFPA 70.
- Output overcurrent protection and disconnect switch must be provided by others.

CAUTION

- 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.

2.1 Consignes de Sécurité

2.1.1 CONSIGNES DE SÉCURITÉ IMPORTANTES CONSERVER CES INSTRUCTIONS

IMPORTANT

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 CONFIÉE A UN PERSONNEL QUALIFIÉ AGRÉÉ. AUCUNE PIÈCE RÉPARABLE PAR L'UTILISATEUR ne se trouve dans l'onduleur.

WARNING

- Cet onduleur renferme sa propre source d'énergie (batteries). Les prises de sortie peuvent être sous tension même lorsque l'onduleur n'est pas branché sur le secteur.
- 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).
- La protection contre une surintensité pour le(s) circuit(s) de sortie de courant alternatif doit être fournie par un autre fournisseur.
- Les interrupteurs de déconnexion convenables pour le(s) circuit(s) de sortie de courant alternatif doivent être fournie par un autre fournisseur.

ATTENTION!

- Les batteries peuvent présenter un risque de décharge électrique ou de brûlure par des courts-circuits de haute intensité. Prendre les précautions nécessaires.
- 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.

2.2 Advertencias de Seguridad

2.2.1 INSTRUCCIONES DE SEGURIDAD IMPORTANTES GUARDE ESTAS INSTRUCCIONES

IMPORTANT

Este manual contiene instrucciones importantes que debe seguir durante la instalación y el mantenimiento del SIE 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.

DANGER

Este SIE 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 SIE.

WARNING

- Este SIE contiene su propia fuente de energía (las baterías). Los receptáculos de salida pueden transmitir corriente eléctrica aun cuando el SIE no esté conectado a un suministro de corriente alterna (c.a.).
- Para reducir el riesgo de incendio o de choque eléctrico, instale este SIE 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).
- La protección contra exceso de corriente para el/los circuito(s) de CA de salida será suministrada por terceros.
- Los interruptores de desconexión debidamente clasificados para el/los circuito(s) de CA de salida serán suministrados por terceros.

PRECAUCIÓN

- Las baterías pueden presentar un riesgo de descargas eléctricas o de quemaduras debido a la alta corriente de cortocircuito. Preste atención a las instrucciones correspondientes.
- 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.

Chapter 3 UPS Installation Plan and Unpacking

Use the following basic sequence of steps to install the UPS:

1. Create an installation plan for the UPS system.
2. Prepare your site for the UPS system.
3. Inspect and unpack the UPS cabinet.
4. Unload and install the UPS cabinet, and wire the system.
5. Complete the Installation Checklist.
6. Have authorized service personnel perform preliminary operational checks and start up the system.

The instructions are intended for the chief operator/system supervisor, electrical consultants, and installation electricians. Local regulations and electrical code must be followed during the UPS installation.

3.1 Creating an Installation Plan

Before installing the UPS system, read and understand how this manual applies to the system being installed. Use this chapter's procedures and illustrations and those in **Chapter 4 *UPS System Installation*** to create a logical plan for installing the system.

3.2 Preparing the Site

For the UPS system to operate at peak efficiency, the installation site should meet the environmental parameters outlined in this manual. The operating environment must meet the weight, clearance, and environmental requirements specified.

3.2.1 Environmental and Installation Considerations

The UPS system installation must meet the following guidelines:

- The system must be installed on a level floor suitable for computer or electronic equipment.
- The system must be operated at an altitude no higher than 1500m (5000 ft) without derating. For additional assistance with high altitude operation, contact an Eaton service representative (see paragraph 1.8 *Getting Help*).
- The system must be installed in a temperature and humidity controlled indoor area free of conductive contaminants.

⚠CAUTION

Do not expose the UPS to overly aggressive environments, like salt mist or corrosive gases. High relative humidity accelerates the effects of contaminants. The UPS should be installed in a G1 environment (based on ANSI/ISA S-71.04 classifications). If the UPS is used in a more aggressive environment, it can cause reduced product life and possibly early failure. If the installation location does not meet the recommended environment, contact Eaton service representative for further information (see paragraph 1.8 *Getting Help*).

- The environmental requirements specified below are for the air at the intake ports of the 9355 UPS, and are the maximum, not to exceed, ratings.
  - There shall be at least a 1.8°F (1.0°C) difference between the dry bulb temperature and the wet bulb temperature, at all times, to maintain a non-condensing environment.
  - The maximum rate of temperature change shall be limited to 3°F over 5 minutes (36°F/hour), based on the ASHRAE Standard 90.1-2013.

- The newer, more energy efficient data center cooling methods (such as air side economization) can create much wider ranges of temperature and Relative Humidity (RH) in the UPS room and/or data center. There are two aspects of this increased operating environment that can, if ignored, create issues.
  - One is the creation of microclimates, which are persistent variations of temperature and/or RH within a single room. For example one side of the room is always cooler than the other side, no matter the actual temperature.
  - The other aspect is the rate of change of temperature and/or RH, which can occur during transitions within the cooling system. Examples: changing the mixture ratio of inside versus outside air, or external changes in the outside air when going from night to day, and back to night.
  - When ignored, either one of these aspects can create an undesirable microclimate at the UPS location. If the environment created by this microclimate exceeds the UPS operating specification, the UPS reliability, over time, will be reduced. These same environmental extremes will also create reliability concerns for any servers that are exposed to them.

Failure to follow guidelines may void your warranty.

The basic environmental requirements for operation of the UPS are:

- Ambient Temperature Range: 5–40°C (41–104°F)
- Recommended Operating Range: 5–40°C (41–104°F)
- Maximum Relative Humidity: 5–95%, noncondensing

⚠CAUTION

If battery systems are located in the same room as the UPS, the battery manufacturer's environmental requirements should be followed if they are more stringent than the UPS requirements. Operating temperatures above the recommended range will result in decreased battery life and performance, and may reduce or void the battery warranty.

The UPS ventilation requirements are shown in Table 1. To allow for future power upgrades, Eaton recommends using air conditioning or ventilation sized for the fully rated UPS kVA installed instead of the derated kVA ordered. Sizing the site cooling infrastructure to be capable of cooling the maximum kVA size will allow a full power rating upgrade without having to modify the infrastructure.

Table 1. Air Conditioning or Ventilation Requirements During Full Load Operation

Model	UPS Rating	Minimum Required Cooling Air Flow
Eaton 9355 UPS	8–15 kVA	104 liter/sec (220 cfm)

The UPS equipment operating environment must meet the weight requirements shown in Table 2 and the size requirements shown in Table 3.

Table 2. UPS Cabinet Weights

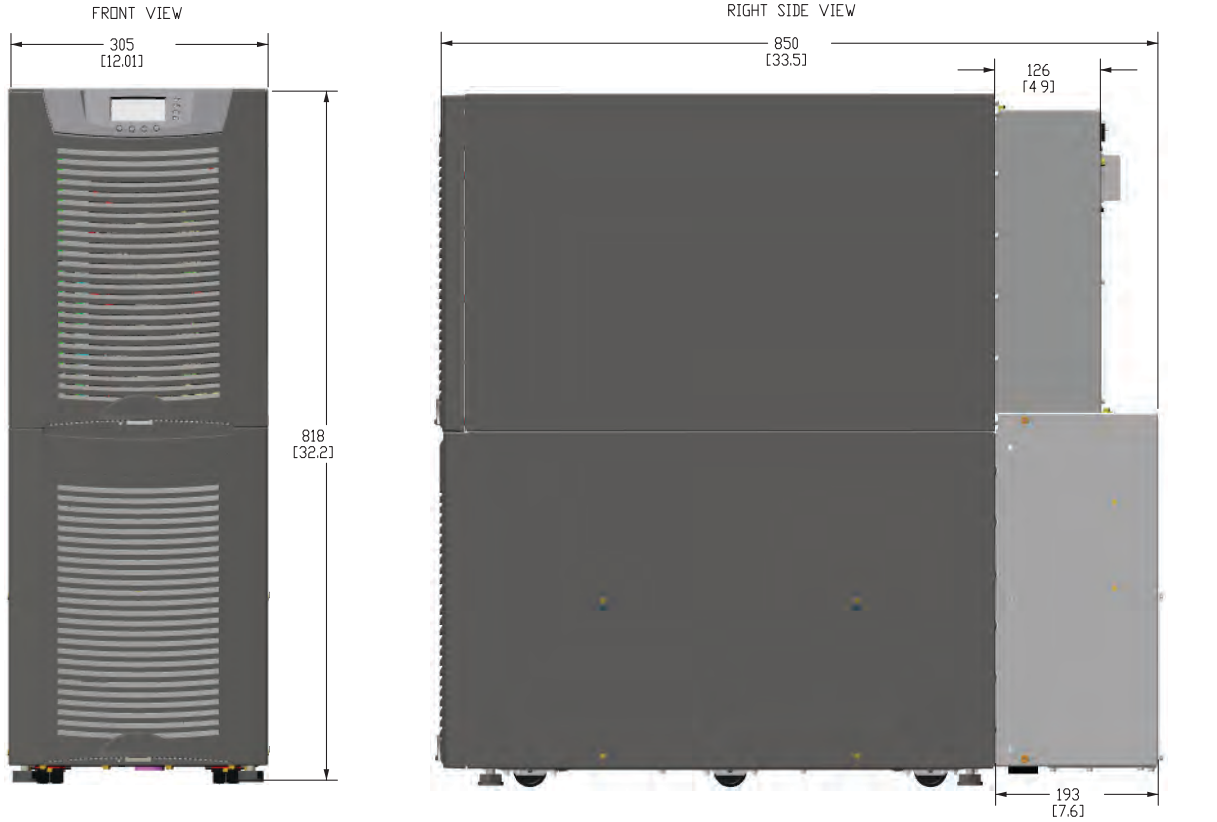
Standard Model Floor Loadings (2-High/3-High Cabinets)		
Eaton 9355 UPS	**Maximum Weight**	**Point Loading lb/in² (kg/cm²)**
2-High UPS	381 lb (173 kg)	95 (6.7)
3-High UPS-32	587 lb (266 kg)	147 (10.3)
3-High UPS-64	619 lb (281 kg)	155 (10.9)
2-High EBM	480 lb (218 kg)	120 (8.4)
3-High EBM	710 lb (322 kg)	178 (12.5)

The UPS cabinet uses forced air cooling to regulate internal component temperature. Allow clearance in front of and in back of the cabinet for proper air circulation. The clearances required around the UPS cabinet are shown in the following table.

Table 3. UPS Cabinet Clearances

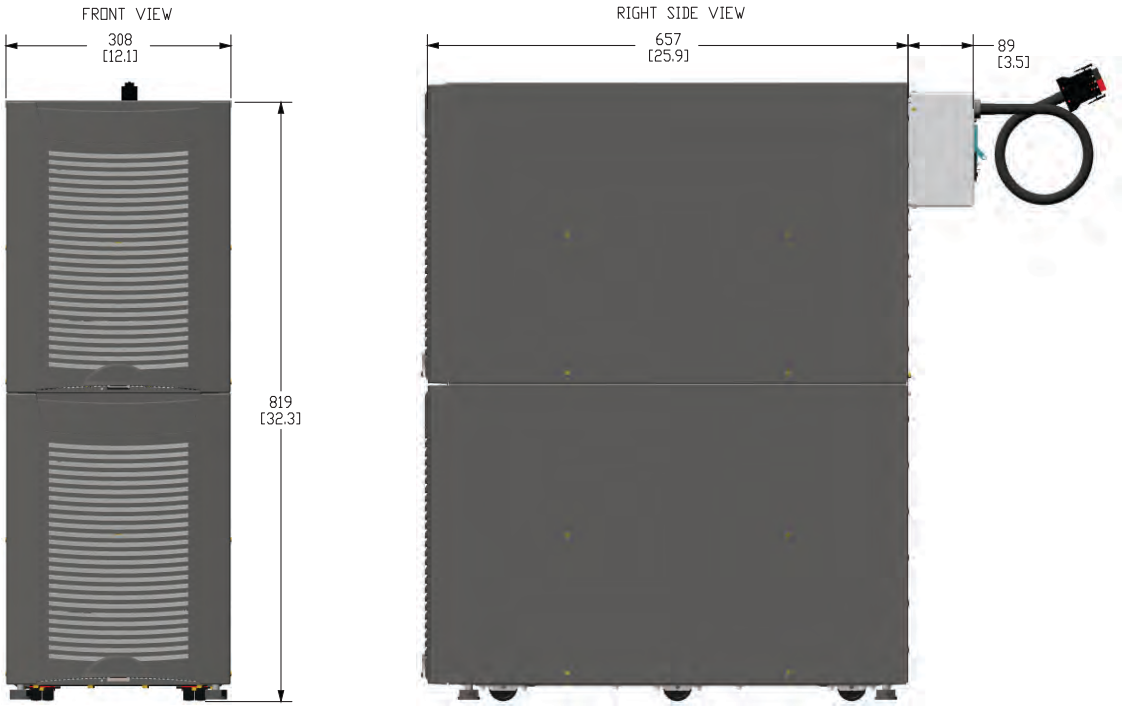
From Front of Cabinet	36" (91.4 cm) working space
From Back of Cabinet	6" (15.2 cm) without PDM installed; with PDM installed, clearance determined by customer-supplied mating plug
NOTE: For serviceability while on MBS, access to the landing feet (if lowered) and sufficient flexible conduit must be provided to move the unit to a location with the following service clearances.	
Service Clearance: From Side or Rear of Cabinet:	8" (20.3 cm) from each lowered rear landing foot
Service Clearance: From Top of Cabinet:	17" (43.2 cm)

Figure 2. UPS Cabinet Dimensions (2-High Front and Right Side Views)



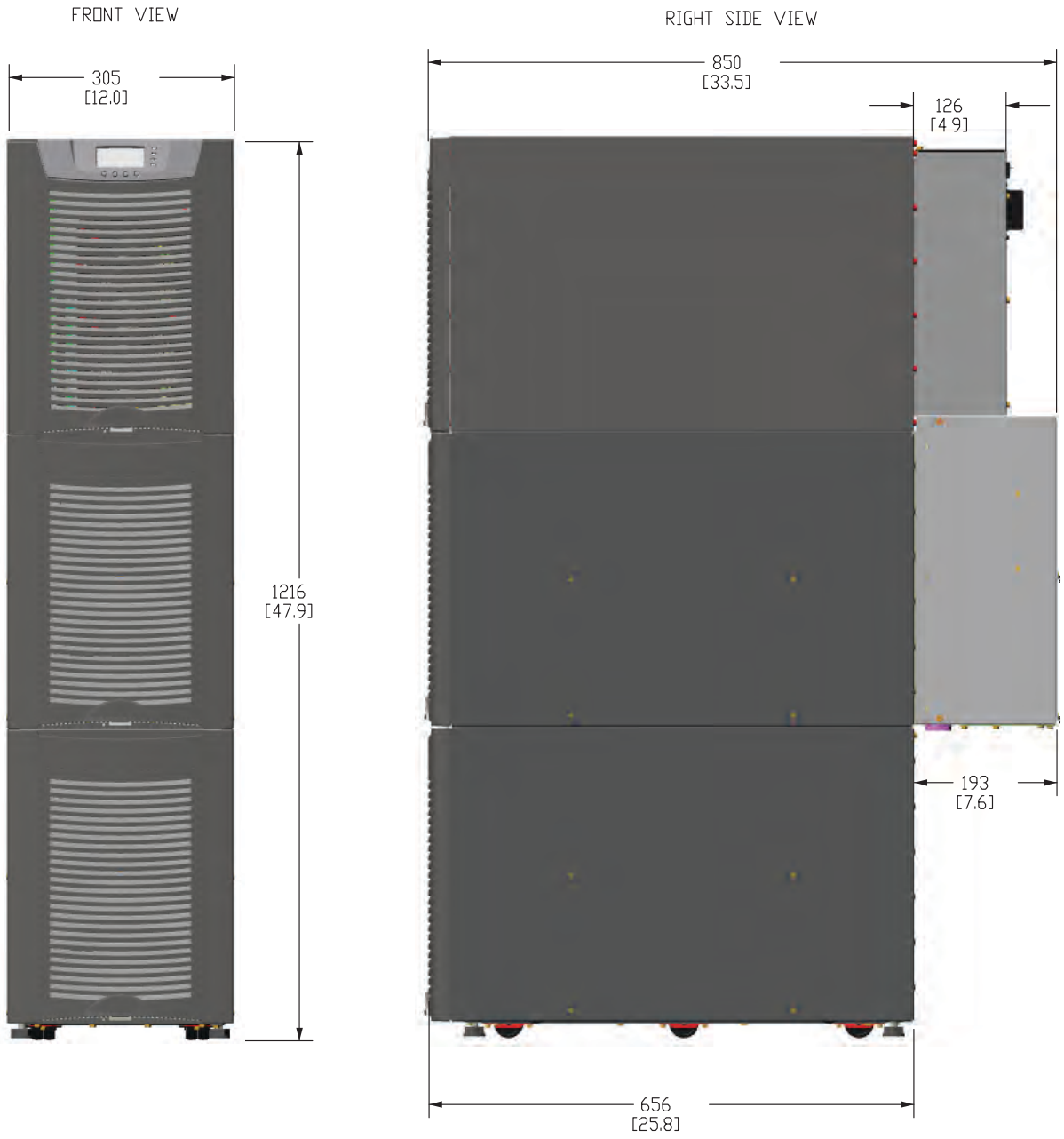
Dimensions are in millimeters [inches]

Figure 3. Extended Battery Module Dimensions (2-High Front and Right Side Views)



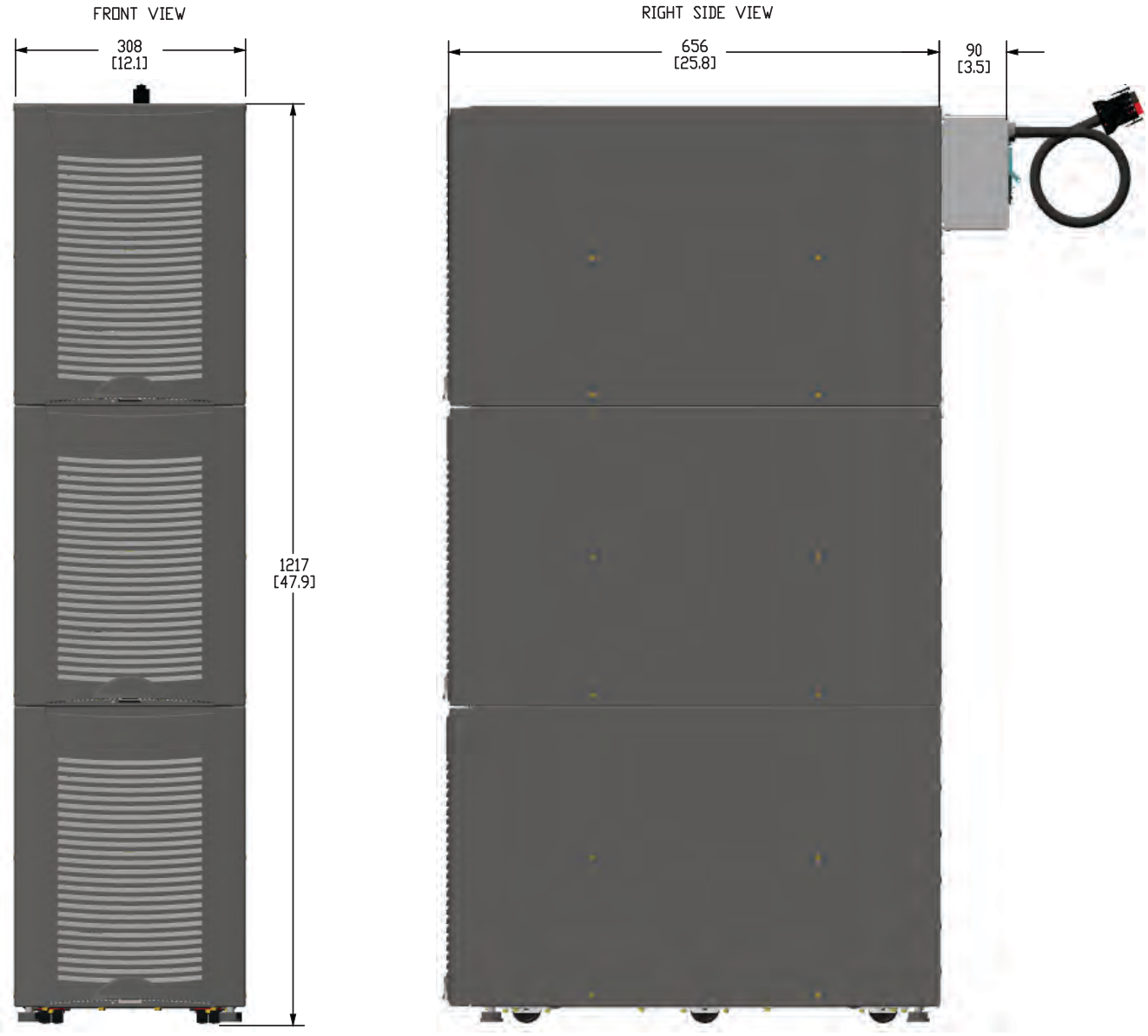
Dimensions are in millimeters [inches]

Figure 4. UPS Cabinet Dimensions (3-High Front and Right Side Views)



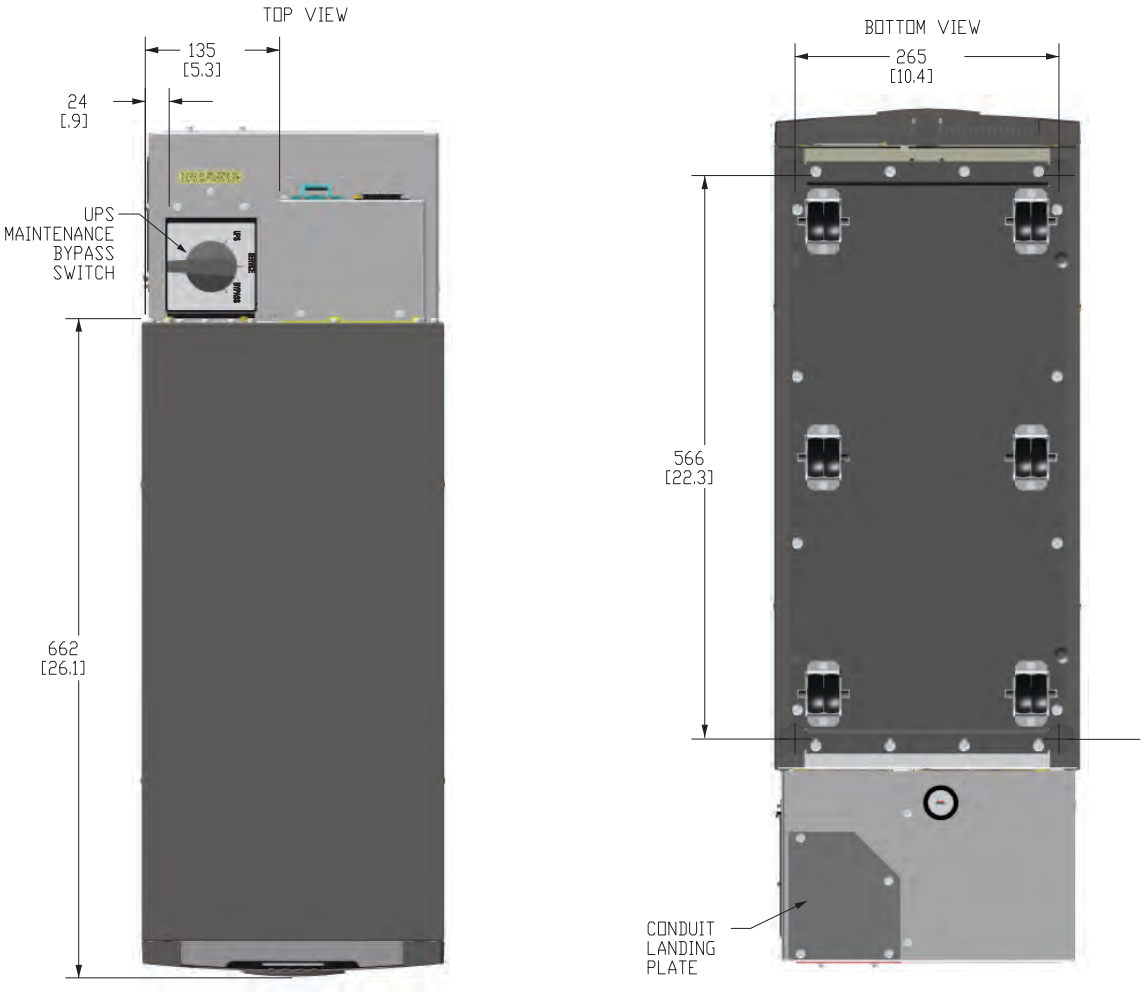
Dimensions are in millimeters [inches]

Figure 5. Extended Battery Module Dimensions (3-High Front and Right Side Views)



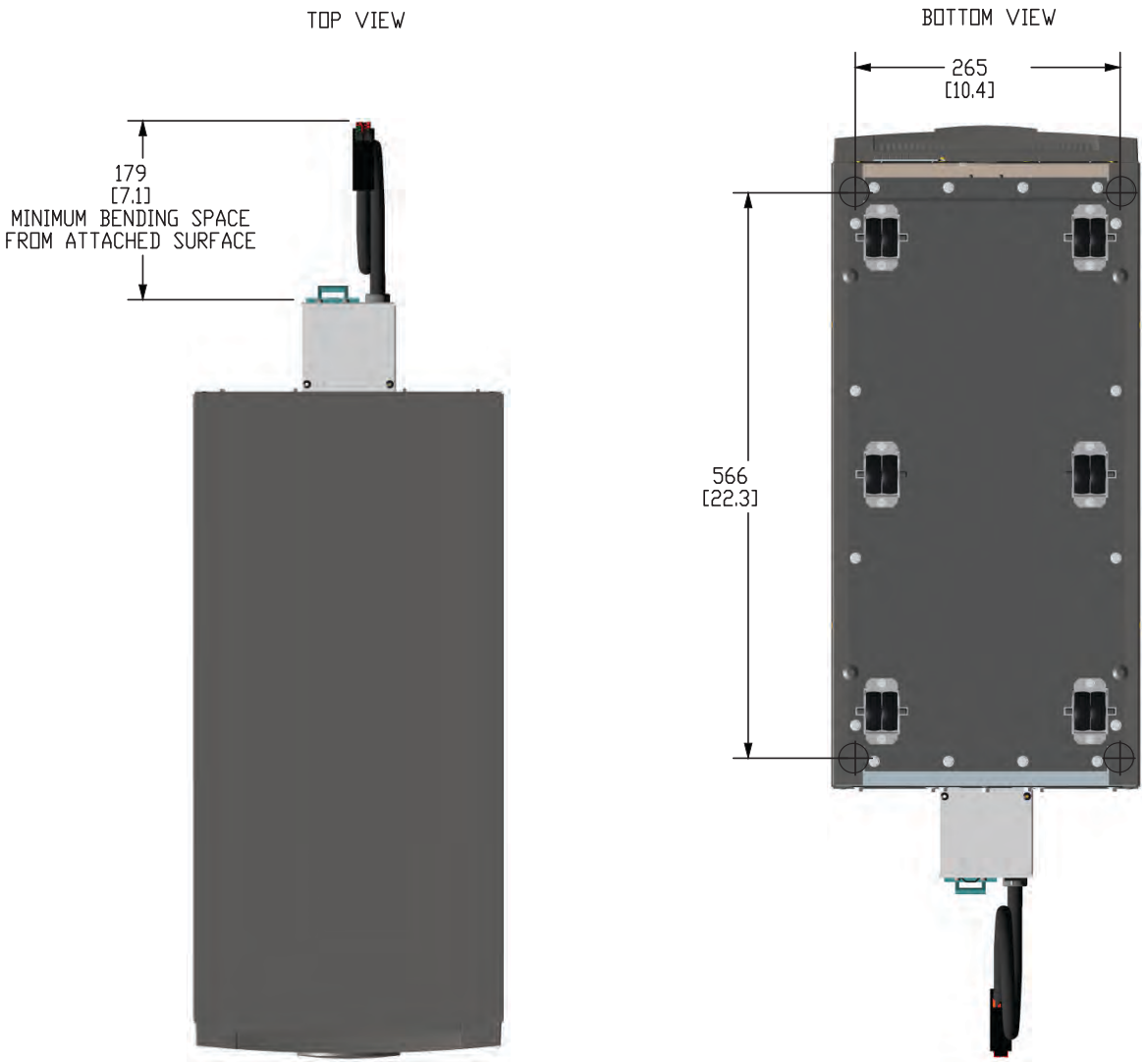
Dimensions are in millimeters [inches]

Figure 6. UPS Cabinet Dimensions (2 or 3-High Top and Bottom Views)



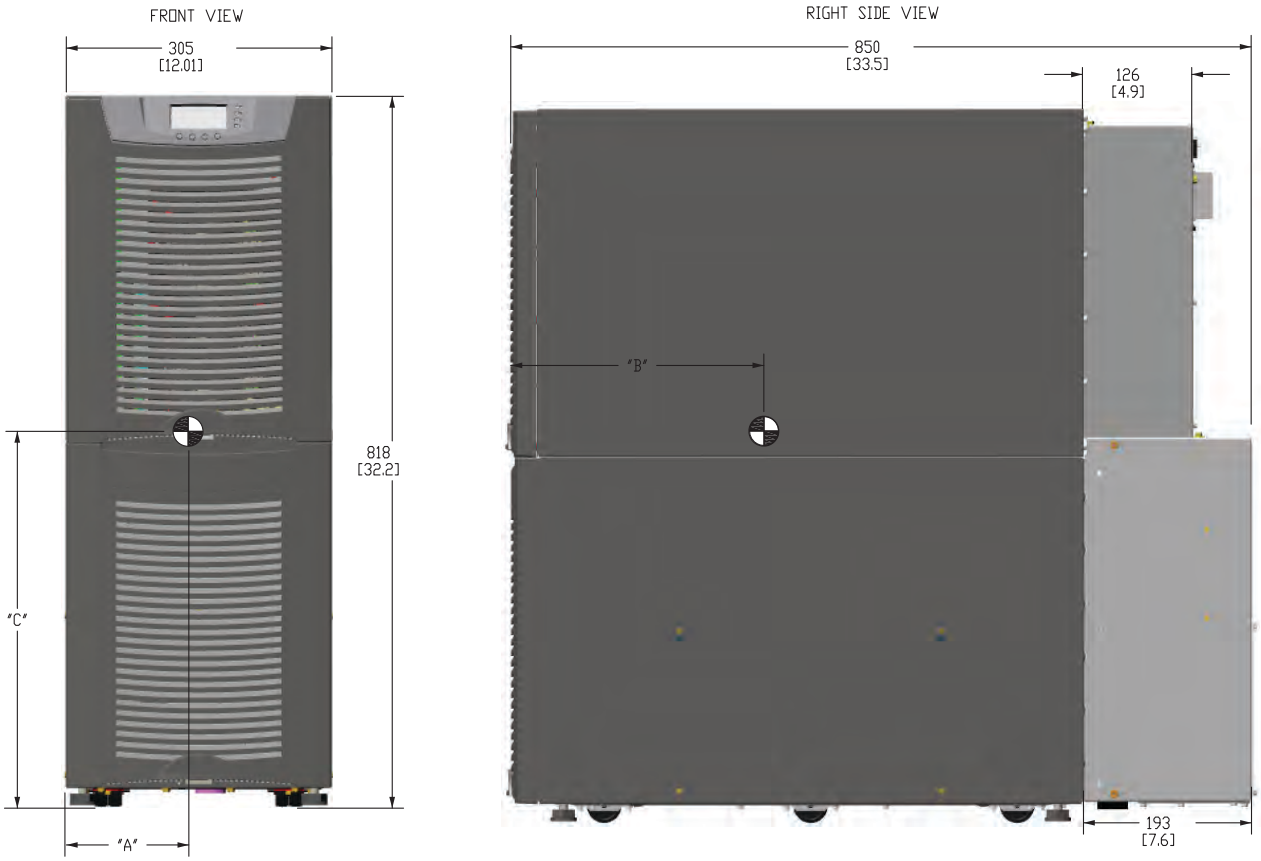
Dimensions are in millimeters [inches]

Figure 7. Extended Battery Module Dimensions (2 or 3-High Top and Bottom Views)



Dimensions are in millimeters [inches]

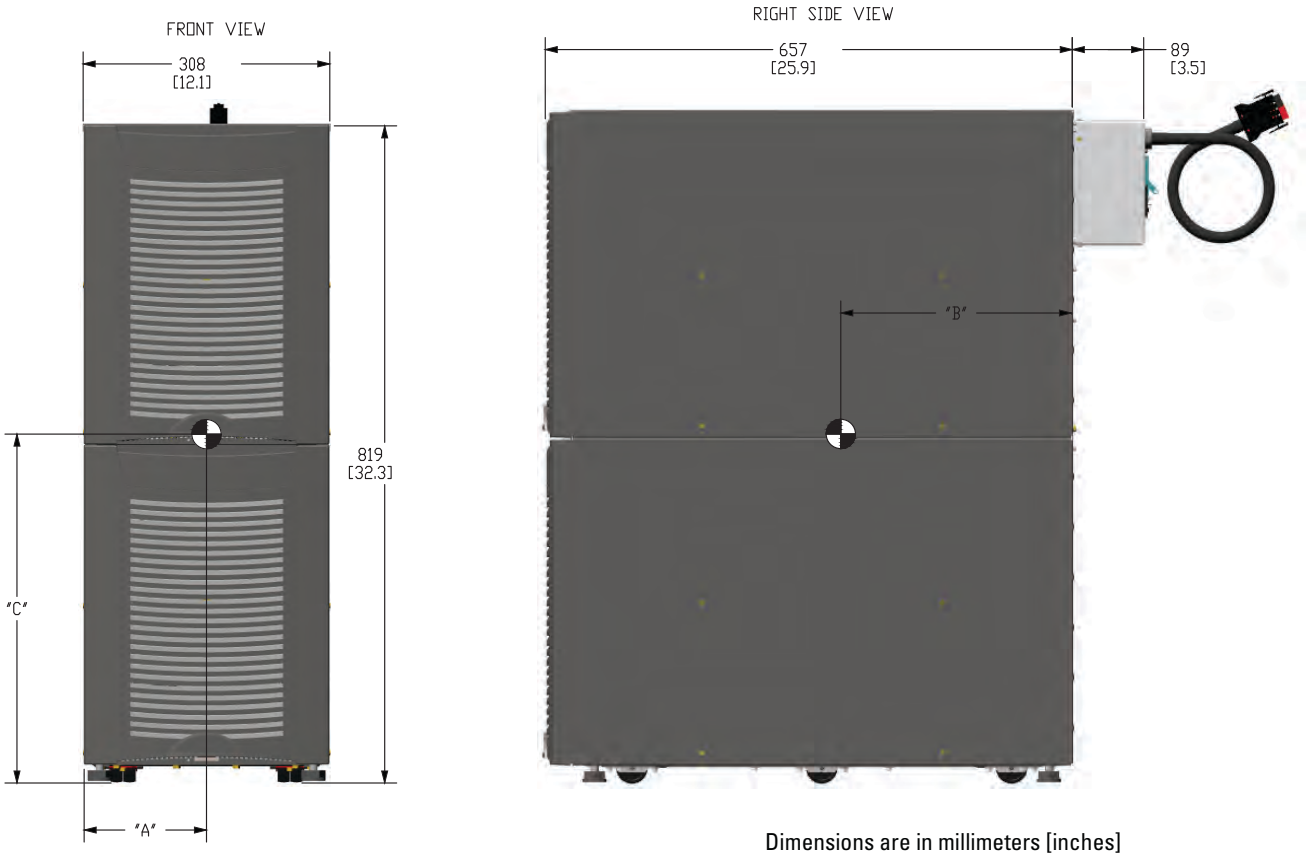
Figure 8. 2-High UPS Cabinet Center of Gravity



Dimensions are in millimeters [inches]

Weight and Center of Gravity	Dimensions mm [in] See Figure 8. A	B	C	Weight kg [lb]
Eaton 9355 8–15 kVA UPS 2-High	81 [3.2]	452 [17.8]	406 [16.0]	169 [373]

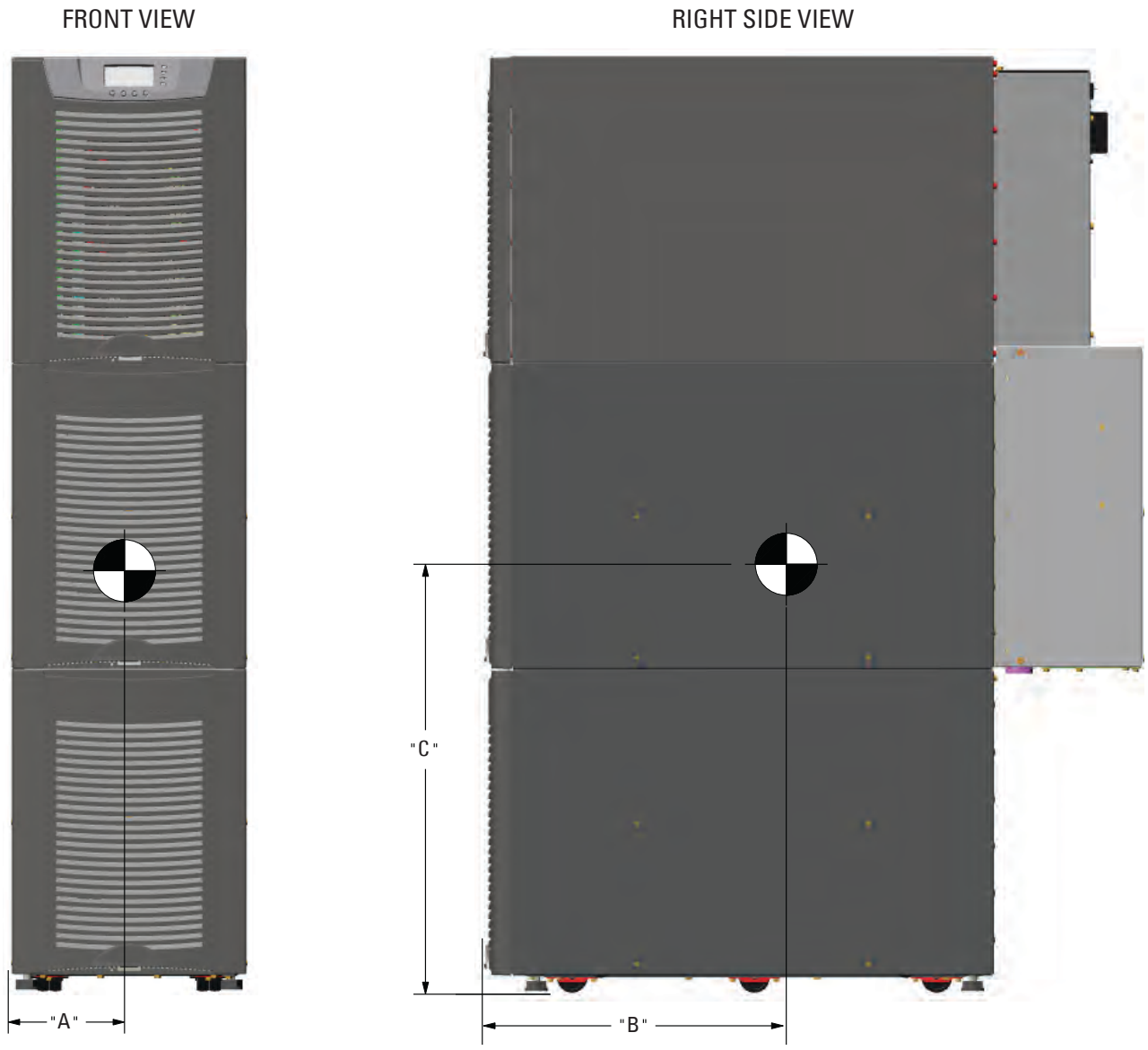
Figure 9. 2-High EBM Cabinet Center of Gravity



Dimensions are in millimeters [inches]

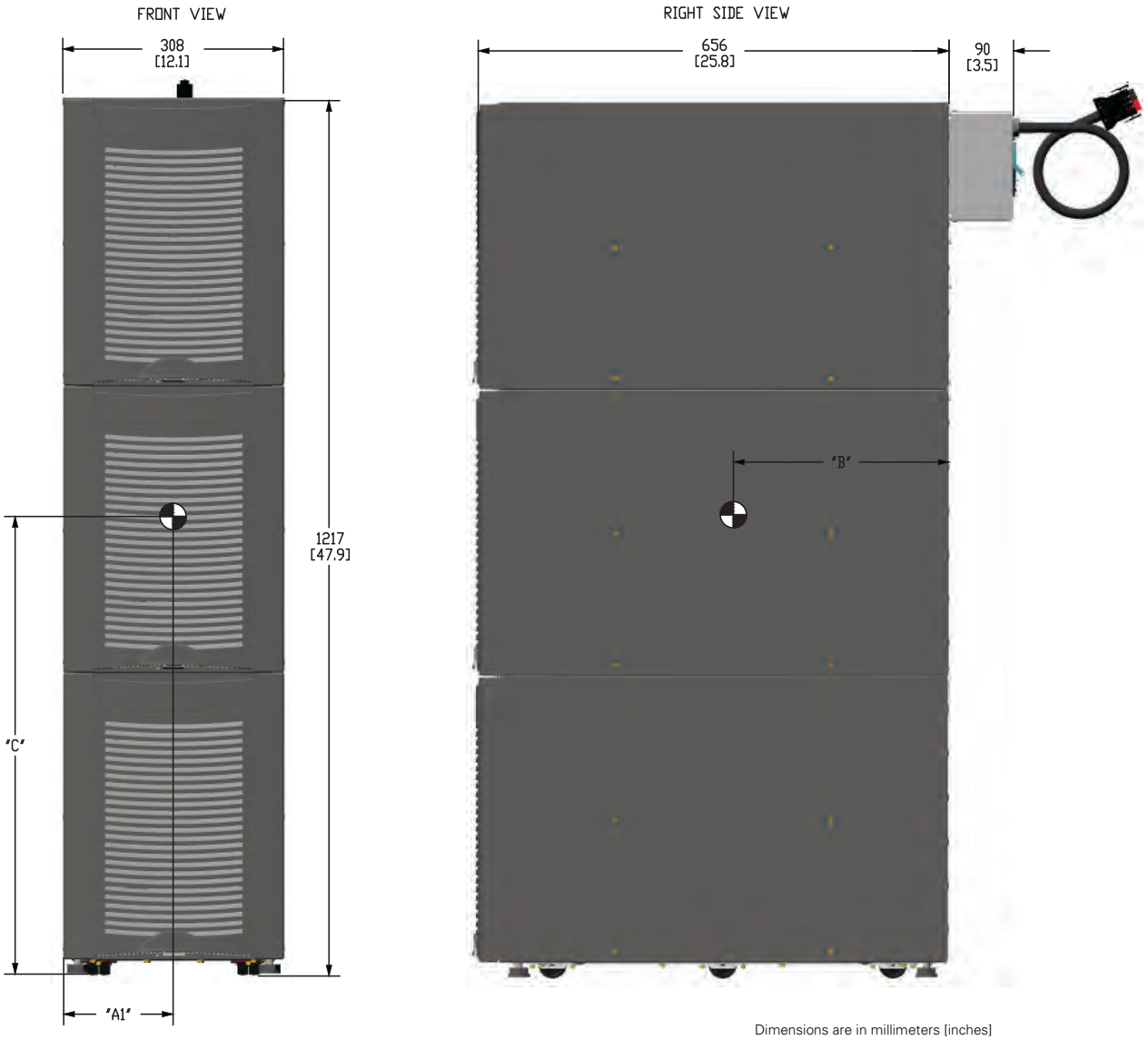
Weight and Center of Gravity	Dimensions mm [in] See Figure 9. A	B	C	Weight kg [lb]
Eaton 9355 Extended Battery Module 2-High	81 [3.2]	452 [17.8]	406 [16.0]	218 [480]

Figure 10. 3-High UPS Cabinet Center of Gravity



Weight and Center of Gravity	Dimensions mm [in] See Figure 10. A	B	C	Weight kg [lb]
Eaton 9355 8–15 kVA UPS 3-High	81 [3.2]	452 [17.8]	610 [24.0]	276 [609]

Figure 11. 3-High EBM Cabinet Center of Gravity



Dimensions are in millimeters [inches]

Weight and Center of Gravity	Dimensions mm [in] See Figure 11. A	B	C	Weight kg [lb]
Eaton 9355 Extended Battery Module 3-High	81 [3.2]	452 [17.8]	610 [24.0]	276 [609]

3.3 UPS System Power Wiring Preparation

Read and understand the following notes while planning and performing the installation:

⚠WARNING

As a result of the connected loads high leakage current is possible. Connection to earth ground is required for safety and proper product operation. Do not check UPS operation by any action that includes removal of the earth (ground) connection with loads attached.

- Refer to national and local electrical codes for acceptable external wiring practices.
- For external wiring, use 90°C copper wire.

⚠ IMPORTANT

This product has been evaluated for use with **copper wire** *only*. For external wiring, use only 90°C copper wire.

Wire sizes listed in Table 4 through Table 6 are for copper wiring only. If wire is run in an ambient temperature greater than 40°C, larger size wire may be necessary. Wire sizes are based on using the specified breakers.

- Recommended wire sizes are based on NFPA National Electrical Code® (NEC®)70 Table 310.15(B)(16) 90° C ampacity with 40°C ambient correction factors.
- Input neutral must be wired for proper operation. Failure to connect an input neutral will void the warranty. If the optional input transformer is installed, an input neutral is not required.
- The Eaton 9355 UPS is a single-feed UPS only.

Table 4. Eaton 9355 10–15 kVA UPS: Recommended Terminal Block Wiring

Model	Voltage	Wire Function	Feeder Circuit Breaker Rating	L1, L2, L3, N Wire Size[1]	Ground Wire Size[1]	Tightening Torque	Conduit Size[2, 3] (Number of Conduits)
Eaton 9355 10 kVA UPS System	208	Input UPS Module, TB1 WYE / 4-Wire	45A	6 AWG	10 AWG	120 lb in (13.5 Nm)	1.00" conduit (1)
	220						
	480	Input XFMR Module Delta / 3-Wire	20A	12 AWG	12 AWG	120 lb in (13.5 Nm)	1.00" conduit (1)
	600				14 AWG		
	208	Output UPS Module, TB1 WYE / 4-Wire		6 AWG	10 AWG	120 lb in (13.5 Nm)	1.00" conduit (1)
	220						
	480 (with transformer)			8 AWG	10 AWG	25 lb in (2.8 Nm)	1.00" conduit (1)
	600 (with transformer)						

Table 4. Eaton 9355 10–15 kVA UPS: Recommended Terminal Block Wiring (Continued)

Model	Voltage	Wire Function	Feeder Circuit Breaker Rating	L1, L2, L3, N Wire Size[1]	Ground Wire Size[1]	Tightening Torque	Conduit Size[2, 3] (Number of Conduits)
Eaton 9355 15 kVA UPS System	208	Input UPS Module, TB1 WYE / 4-Wire	60A	4 AWG	10 AWG	120 lb in (13.5 Nm)	1.25" conduit (1)
	220						
	480	Input XFMR Module Delta / 3-Wire	30A	10 AWG	10 AWG	120 lb in (13.5 Nm)	1.00" conduit (1)
	600		25A				
	208	Output UPS Module, TB1 WYE / 4-Wire		6 AWG	10 AWG	120 lb in (13.5 Nm)	1.00" conduit (1)
	220						
	480 (with transformer)			6 AWG	10 AWG	25 lb in (2.8 Nm)	1.00" conduit (1)
	600 (with transformer)						

[1] Use only 90°C-rated copper wire. Minimum wire size is based on 120/208 full load ratings applied to National Electrical Code (NEC) Table 310-104(A). Code may require a larger AWG size than shown in this table because of temperature, number of conductors in the conduit, or long service runs. Follow local requirements.

[2] Per NEC article 300 20(a) for Ferrous Metal Raceways, 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.

[3] Conduit is sized to accommodate one neutral conductor the same size as the phase conductor and one #8 AWG ground conductor. If two neutral conductors or an oversized neutral conductor are to be installed, check the size of the conduit needed to accommodate the extra wire or size and use that conduit size in place of the conduit size listed. Conduit sizes were chosen from NEC Table C1, type letters RHH, RHW, RHW 2, TW, THW, THHW, THW 2.

Table 5. Eaton 9355 10–15 kVA UPS with Version 1 Wall-Mounted Bypass Switch: Recommended Terminal Block Wiring

Model	Voltage	Wire Function	Feeder Circuit Breaker Rating	L1, L2, L3, N Wire Size[1]	Ground Wire Size[1]	Tightening Torque	Conduit Size[2, 3] (Number of Conduits)
Eaton 9355 10 kVA UPS System	208	Input	45A	6 AWG	10 AWG	120 lb in (13.5 Nm)	1.00" conduit (1)
	220			8 AWG			
	208	Output		8 AWG	10 AWG	120 lb in (13.5 Nm)	1.00" conduit (1)
	220						
Eaton 9355 15 kVA UPS System	208	Input	60A	4 AWG	10 AWG	120 lb in (13.5 Nm)	1.25" conduit (1)
	220						
	208	Output		6 AWG	10 AWG	120 lb in (13.5 Nm)	1.00" conduit (1)
	220						

1 Use only 90°C-rated copper wire. Minimum wire size is based on 120/208 full load ratings applied to NEC Code Table 310-104(A). Code may require a larger AWG size than shown in this table because of temperature, number of conductors in the conduit, or long service runs. Follow local requirements.

2 Per NEC article 300 20(a) for Ferrous Metal Raceways, 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.

3 Conduit is sized to accommodate one neutral conductor the same size as the phase conductor and one #8 AWG ground conductor. If two neutral conductors or an oversized neutral conductor are to be installed, check the size of the conduit needed to accommodate the extra wire or size and use that conduit size in place of the conduit size listed. Conduit sizes were chosen from NEC Table C1, type letters RHH, RHW, RHW 2, TW, THW, THHW, THW 2.

Table 6. Eaton 9355 10–15 kVA UPS with Version 2 Wall-Mounted Bypass Switch: Recommended Terminal Block Wiring

Model	Voltage	Wire Function	Feeder Circuit Breaker Rating	L1, L2, L3, N Wire Size[1]	Ground Wire Size[1]	Tightening Torque	Conduit Size[2, 3] (Number of Conduits)
Eaton 9355 10 kVA UPS System	208	Input	45A	6 AWG	10 AWG	120 lb in (13.5 Nm)	1.00" conduit (1)
	220			8 AWG			
	208	Output		8 AWG	10 AWG	120 lb in (13.5 Nm)	1.00" conduit (1)
	220						
Eaton 9355 15 kVA UPS System	208	Input	60A	4 AWG	10 AWG	120 lb in (13.5 Nm)	1.25" conduit (1)
	220						
	208	Output		6 AWG	10 AWG	120 lb in (13.5 Nm)	1.00" conduit (1)
	220						

[1] Use only 90°C-rated copper wire. Minimum wire size is based on 120/208 full load ratings applied to NEC Code Table 310-104(A). Code may require a larger AWG size than shown in this table because of temperature, number of conductors in the conduit, or long service runs. Follow local requirements.

[2] Per NEC article 300 20(a) for Ferrous Metal Raceways, 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.

[3] Conduit is sized to accommodate one neutral conductor the same size as the phase conductor and one #8 AWG ground conductor. If two neutral conductors or an oversized neutral conductor are to be installed, check the size of the conduit needed to accommodate the extra wire or size and use that conduit size in place of the conduit size listed. Conduit sizes were chosen from NEC Table C1, type letters RHH, RHW, RHW 2, TW, THW, THHW, THW 2.

IMPORTANT

If a 4-pole Automatic Transfer Switch (ATS) is used to connect the UPS to a generator or alternative input source, it may interrupt the UPS input neutral during its transition between sources. This UPS should always have an input source neutral connected at the bypass input terminals. This neutral must be continuous and uninterrupted; even if there are no phase-to-neutral loads connected to the UPS output. If the UPS is fed from a 4-pole ATS that interrupts the neutral, a delta-to-wye isolation transformer, with its secondary neutral bonded to ground, must be placed in line with the bypass input of the UPS. This will provide an uninterrupted neutral to the UPS, regardless of the position of the ATS neutral contact.

Note: if an overlapping neutral or make-before-break ATS switch is used, the neutrals must overlap for a minimum of 50 msec during the transition. In these cases, a transformer is not needed.

3.4 Inspecting and Unpacking the Equipment

The cabinet is shipped bolted to a metal and wood pallet with outer protective packaging material covering the cabinets.

1. Carefully inspect the outer packaging for evidence of damage during transit.

CAUTION

Do not install a damaged cabinet. Report any damage to the carrier and contact an Eaton service representative immediately.

2. Use a forklift or pallet jack to move the packaged cabinet to the installation site, or as close as possible, before unpacking. If possible, move the cabinet using the pallet. Insert the forklift or pallet jack forks between the supports on the bottom of the pallet.
3. Set the pallet on a firm, level surface, allowing a minimum clearance of 3m (10 ft) on each side for removing the cabinet from the pallet.
4. Remove the protective packaging material from the cabinet and recycle in a responsible manner. Retain any parts kits packaged with the cabinet.
5. Inspect the contents for any evidence of physical damage, and compare each item with the Bill of Lading. If damage has occurred or shortages are evident, contact an Eaton service representative immediately to determine the extent of the damage and its impact on further installation.

   If any equipment has been damaged during shipment, keep the shipping 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 While waiting for installation, protect the unpacked cabinet from moisture, dust, and other harmful contaminants. Failure to store and protect the UPS properly may void the warranty.

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

Chapter 4 UPS System Installation

4.1 Preliminary Installation Information

⚠WARNING

Installation should be performed only by qualified personnel.

Refer to the following while installing the UPS system:

- Review **Chapter 3 *UPS Installation Plan and Unpacking***, for cabinet dimensions, equipment weight, wiring and terminal data, and installation notes.
- Do not tilt the cabinets more than ±10° during installation.
- Remove conduit landing plates to add conduit landing holes as required.
- If perforated floor tiles are required for ventilation, place them in front of the UPS.

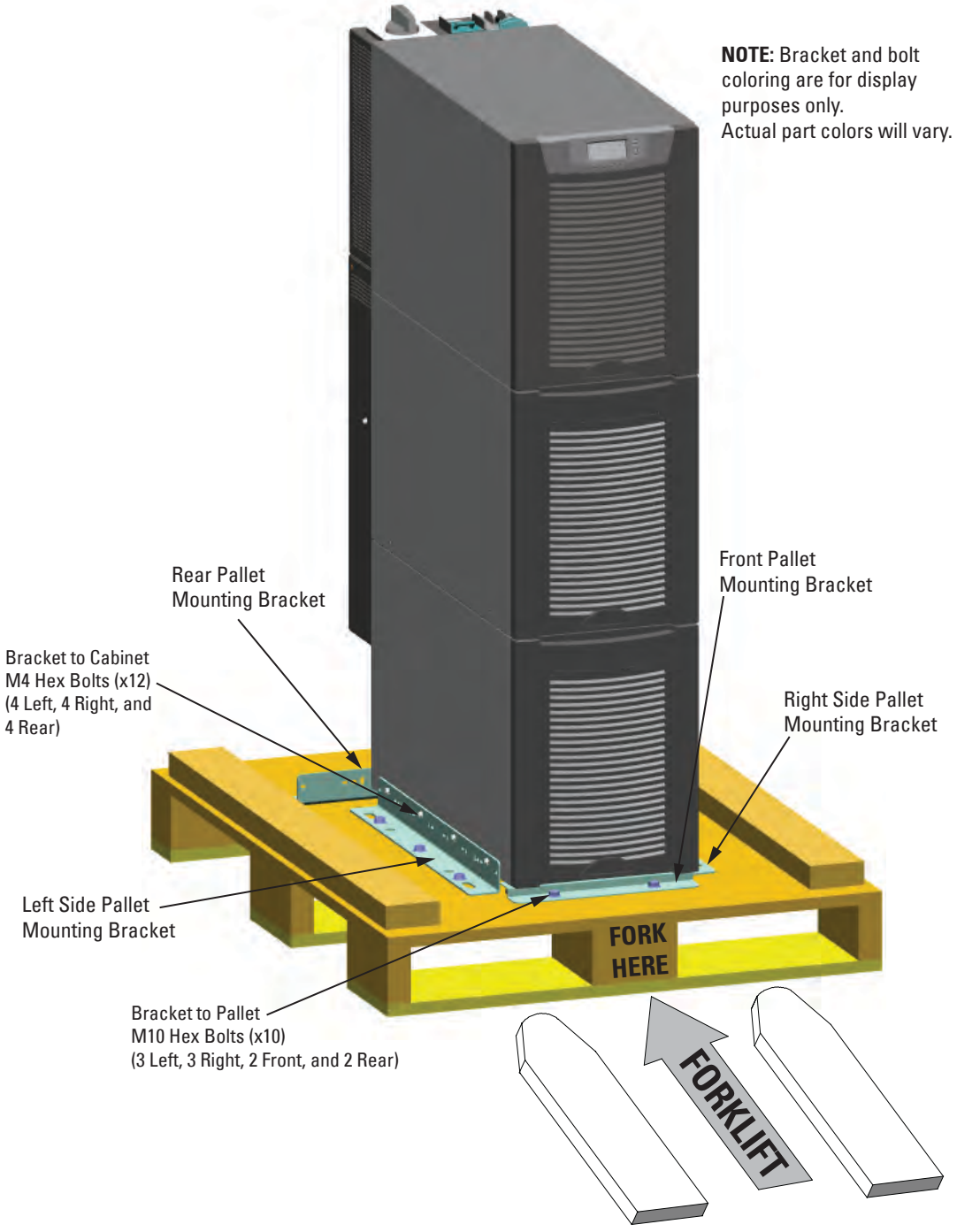
4.1.1 Moving the Pallet Mounted Cabinet

- Use a forklift or pallet jack to move the packaged cabinet to the installation site, or as close as possible, before unpacking.
- Verify that the forklift or pallet jack is rated to handle the weight of the cabinet (see Table 2 for cabinet weight).
- Insert the forklift or pallet jack forks between the front supports of the pallet, see Figure 12 for three-high cabinet details or see Figure 18 for two-high cabinet details.

⚠WARNING

Only move the pallet mounted cabinet by forklift or pallet jack with forks between the front supports of the pallet.

Figure 12. Three-High Cabinet on Pallet — Details



NOTE UPS design varies based on options ordered and installed prior to shipment.

4.2 Unloading the UPS Cabinet from the Pallet

The following tools are required for unloading the cabinet(s):

- 10 mm wrench or socket
- 4 mm wrench, nutdriver, or socket

⚠CAUTION

The UPS and EBM cabinets are heavy (see Table 2). Unloading the cabinets requires at least two people to safely remove the cabinets from the pallet. Be sure to support the front and rear of the cabinet during the entire unloading process.

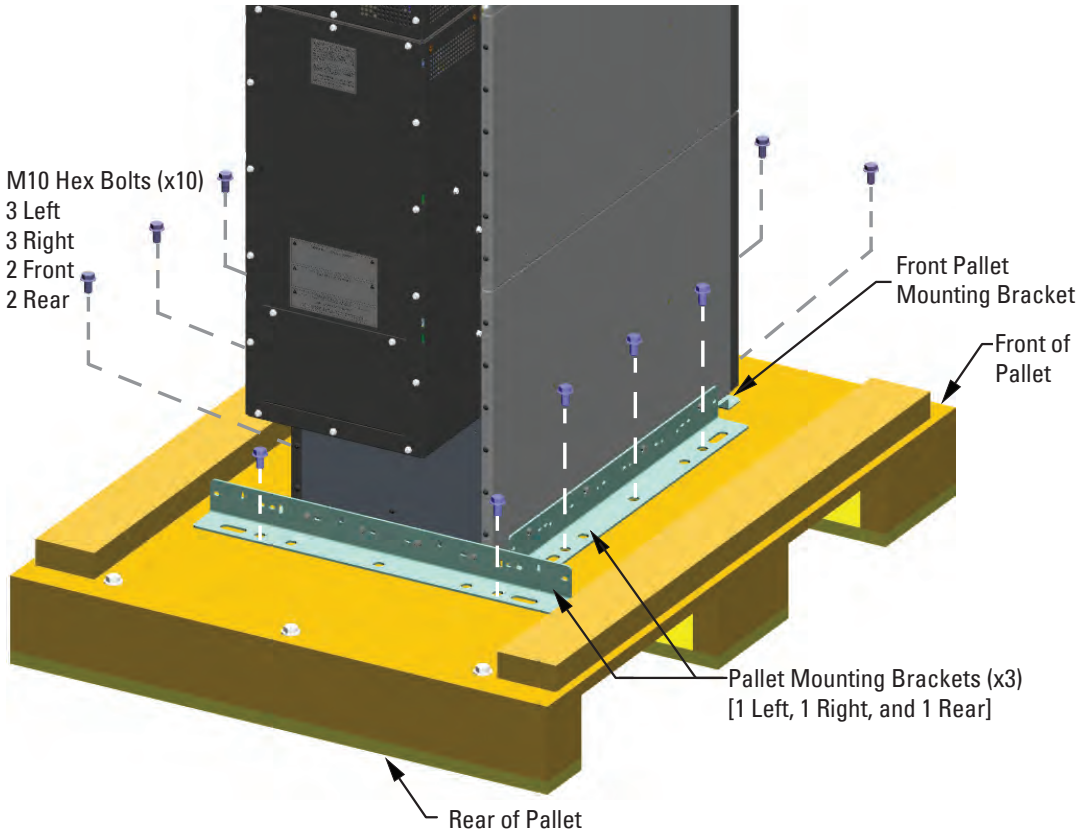
To unload three-high cabinets or EBM cabinets, proceed to paragraph 4.2.1 *Three-High Cabinets or EBM Cabinets*. To unload two-high UPS cabinets, proceed to paragraph 4.2.2 *Two-High UPS Cabinets*.

4.2.1 Three-High Cabinets or EBM Cabinets

To remove a three-high cabinet or a two-high EBM cabinet from the shipping pallet:

1. Remove the two M10 bolts from the rear pallet mounting bracket securing it to the pallet (see Figure 13).

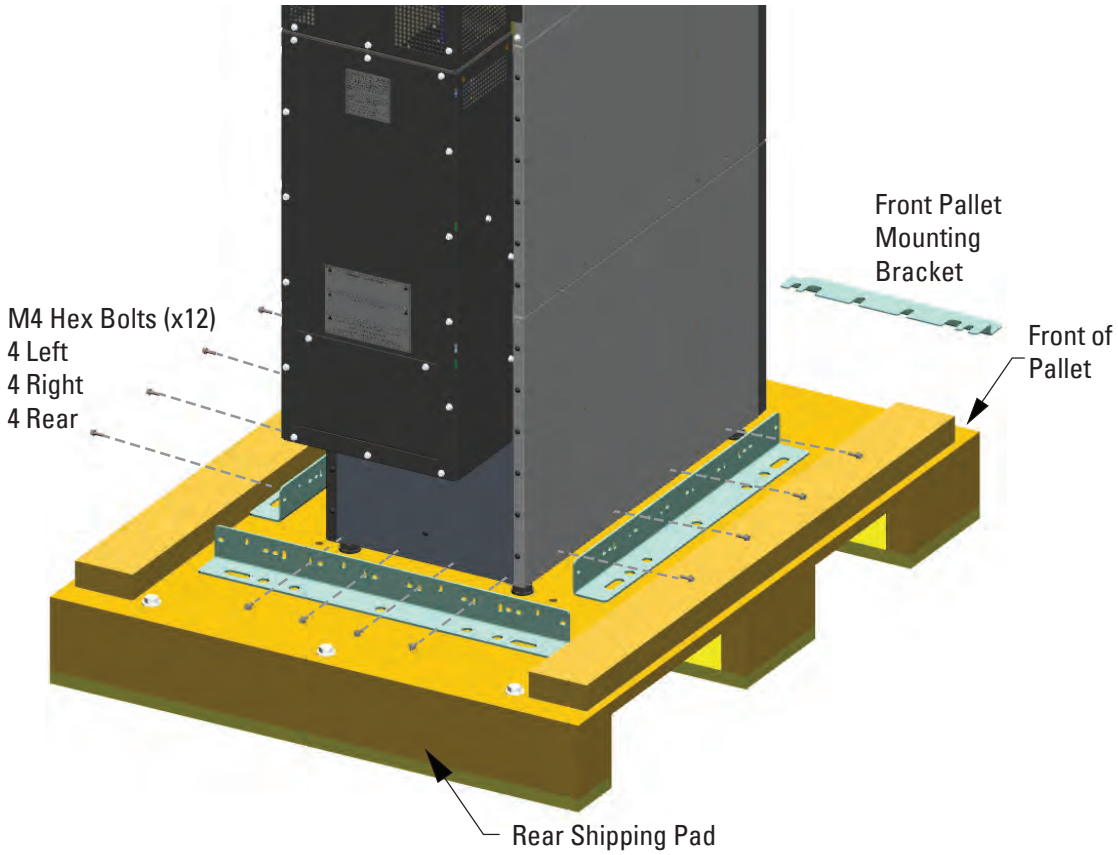
Figure 13. Removing the Bracket to Pallet Mounting Bolts



2. Remove the three M10 bolts from the left and right side pallet mounting brackets securing the brackets to the pallet.
3. Remove the four M4 screws from the three pallet mounting brackets (left, right and rear) that secure the brackets to the cabinet and remove the brackets (see Figure 14). Retain the hardware for later use.

NOTE Retain the rear pallet bracket and hardware for later re-assembly onto the cabinet to stabilize it and secure it to the floor of the facility.

Figure 14. Removing the Pallet Mounting Brackets



4. Remove the front cover from the bottom cabinet to access the front shipping bracket.

   Press and release the handle latch at the bottom of the cover and then lift the cover up and off the cabinet.

CAUTION

To maintain stability of the pallet, apply downward pressure to the front of the pallet when completing steps 5 through 7 to prevent tipping.

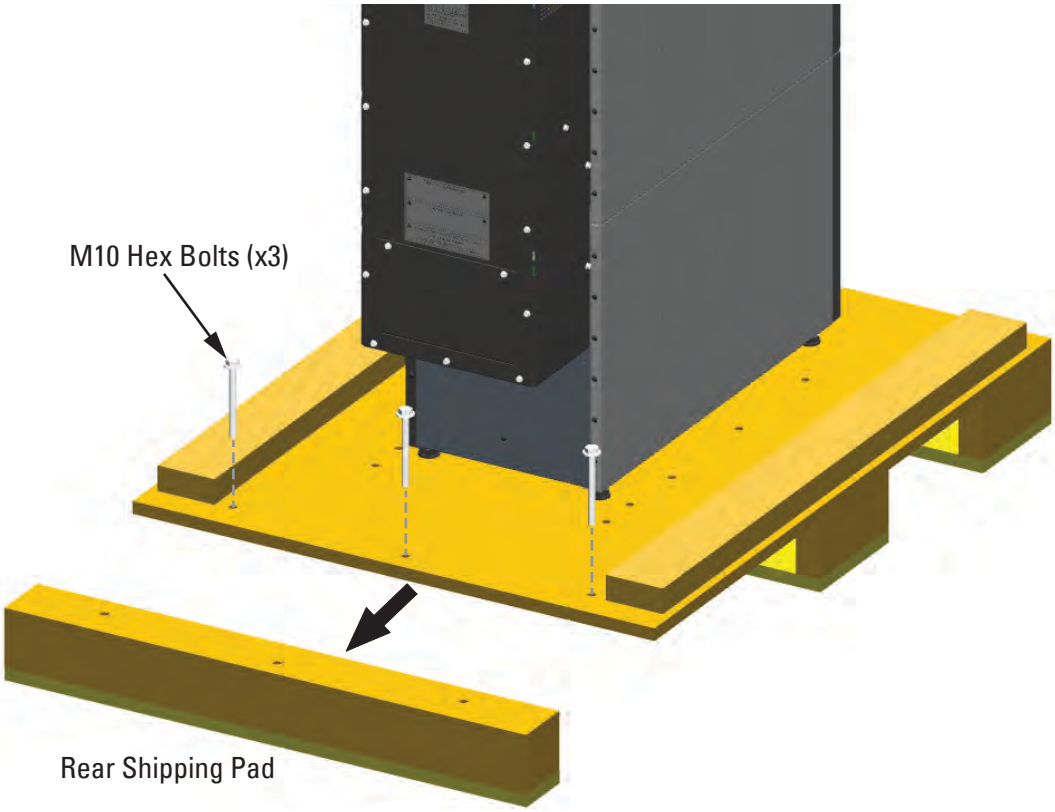
5. Remove the two M10 bolts securing the front shipping bracket and remove the bracket, see Figure 14.

   If needed, adjust the leveling feet to release the bracket.

6. Remove the three M10 bolts securing the rear shipping pad to the pallet and remove the shipping pad, see Figure 15.

NOTE Hold the back of the cabinet so that the bolts can be removed easily without the cabinet rolling backward.

Figure 15. Removing the Shipping Pad



7. Reinstall the front cover removed in Step 4.

   Hang the top edge of the cover on the cabinet first, then lower the bottom edge and snap into place.

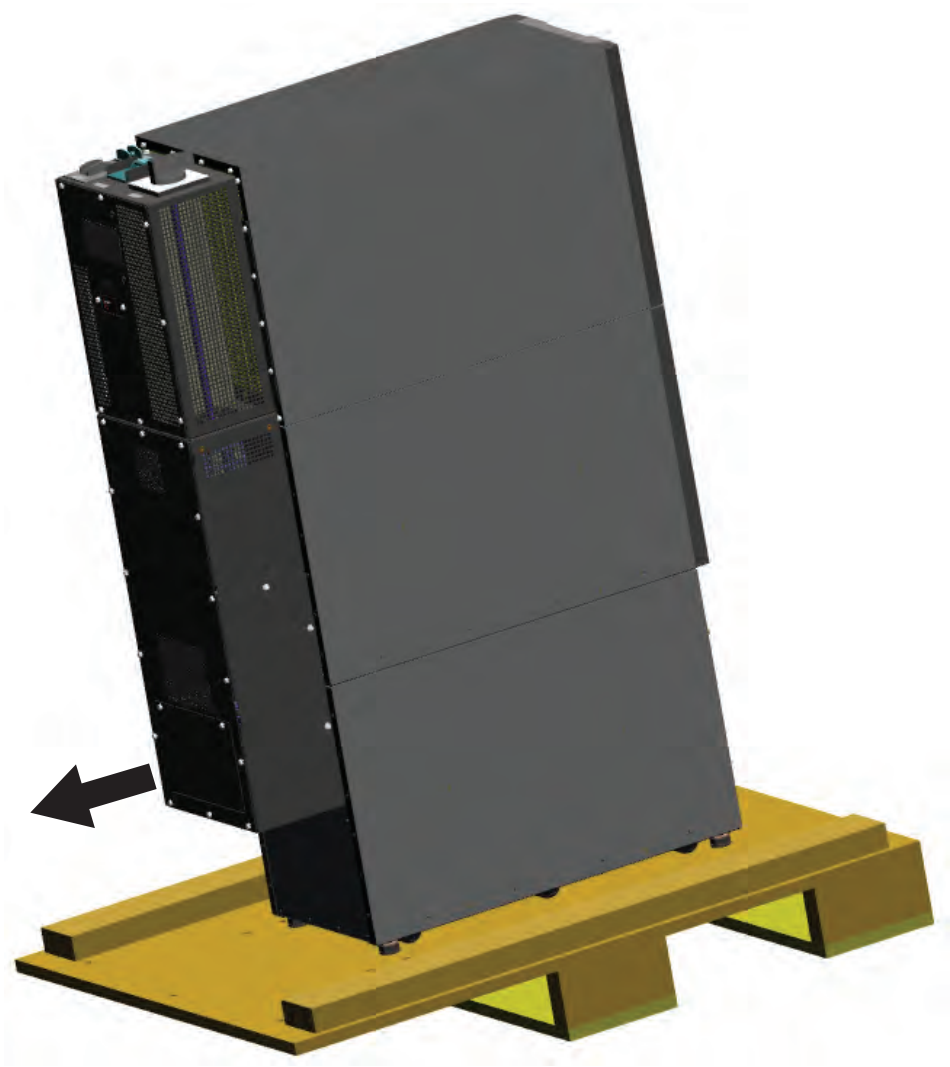
IMPORTANT

Support the front and back of the cabinet when rolling it off the pallet to prevent tipping.

8. Slowly roll the cabinet toward the rear of the pallet. Once the pallet tilts, continue rolling the cabinet down the pallet until the cabinet touches the floor (see Figure 16).

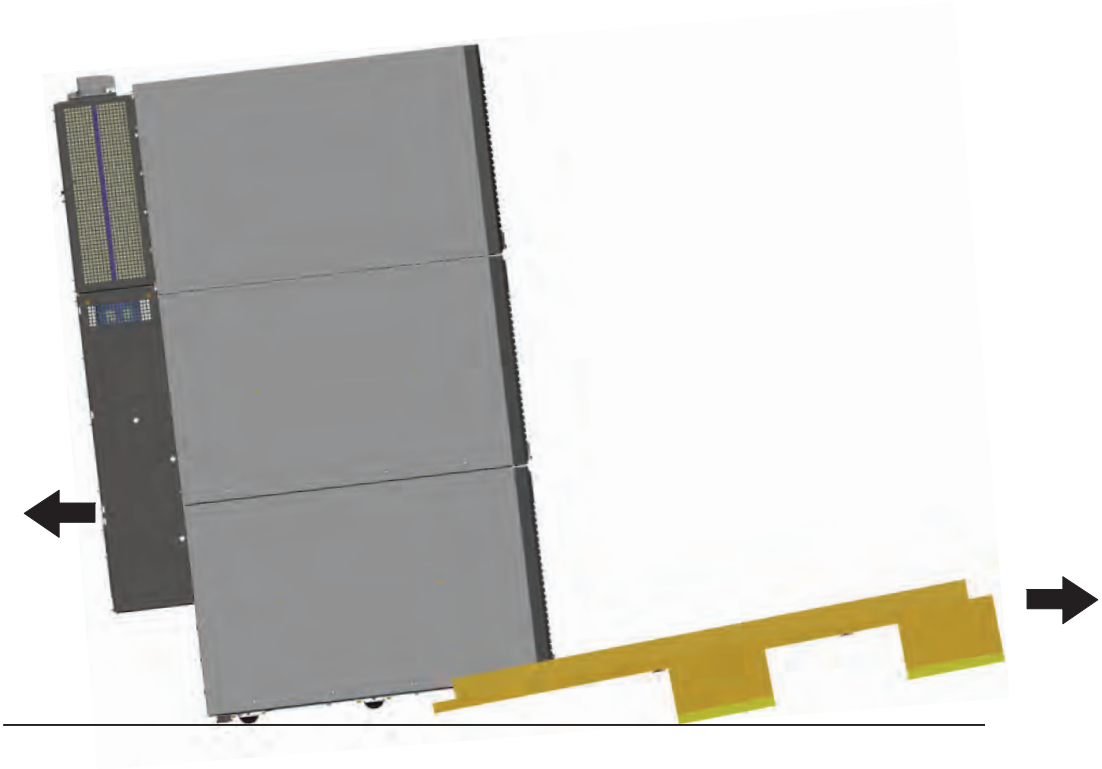
   If needed, adjust the leveling feet so that the cabinet rolls freely.

Figure 16. Unloading the Cabinet



9. With the cabinet supported, slowly pull the pallet away from the cabinet (see Figure 17).

Figure 17. Removing the Pallet

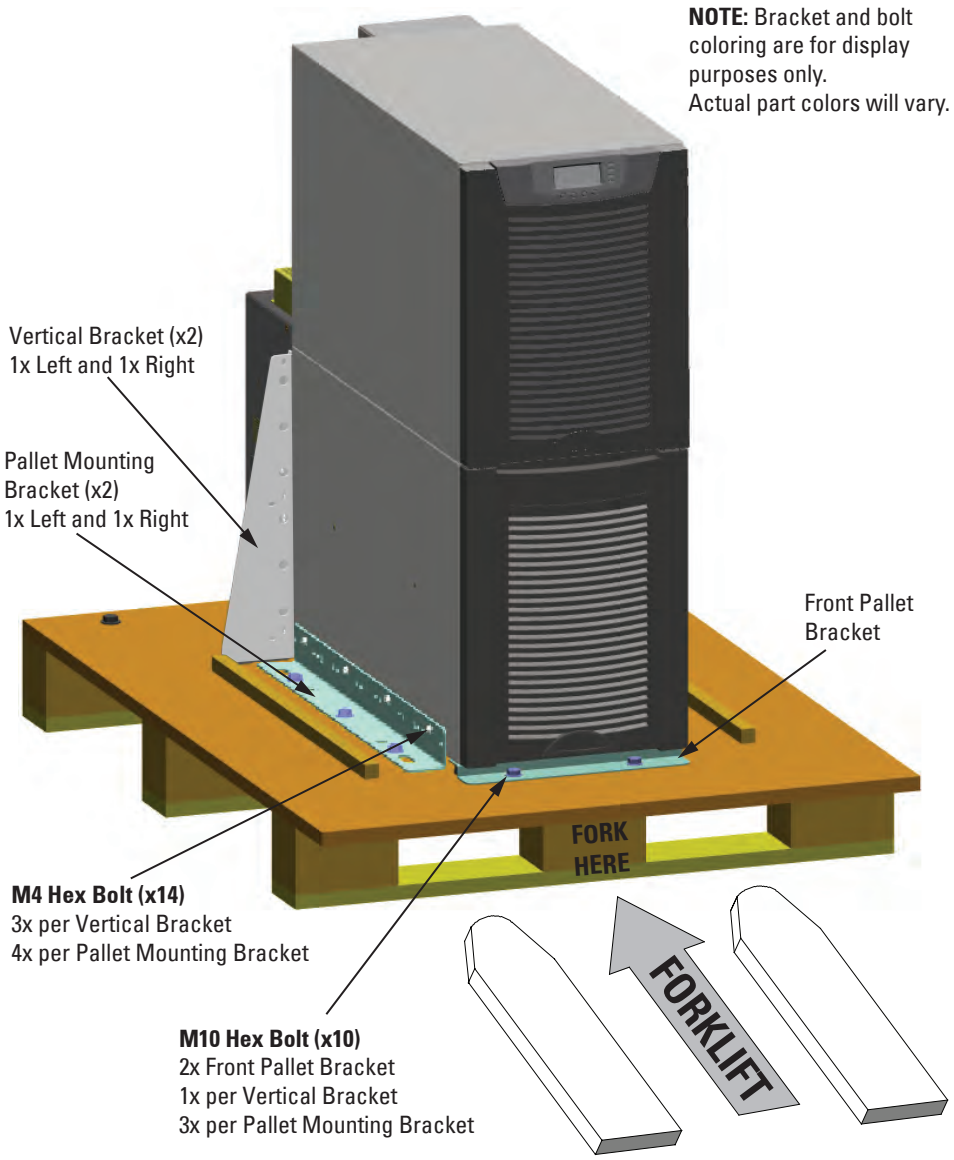


10. Roll the cabinet to the desired location.
11. Proceed to paragraph 4.3.1 *Selecting an Installation Option*.

4.2.2 Two-High UPS Cabinets

To remove a two-high UPS from the shipping pallet:

Figure 18. Two-High Cabinet on Pallet — Details



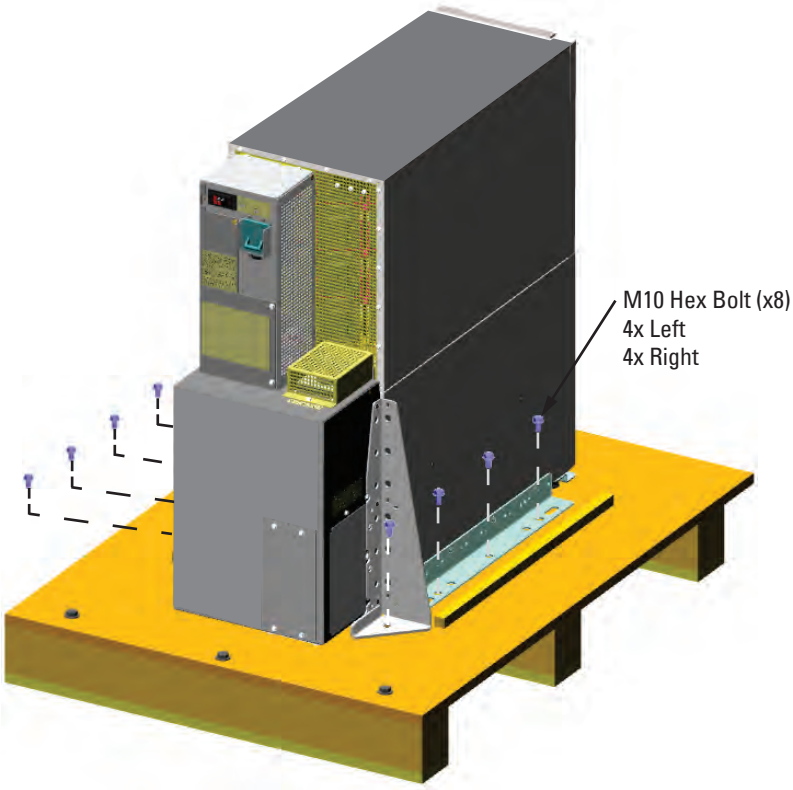
NOTE UPS design varies based on options ordered and installed prior to shipment.

⚠WARNING

Only move the pallet mounted cabinet by forklift or pallet jack with forks between the front supports of the pallet.

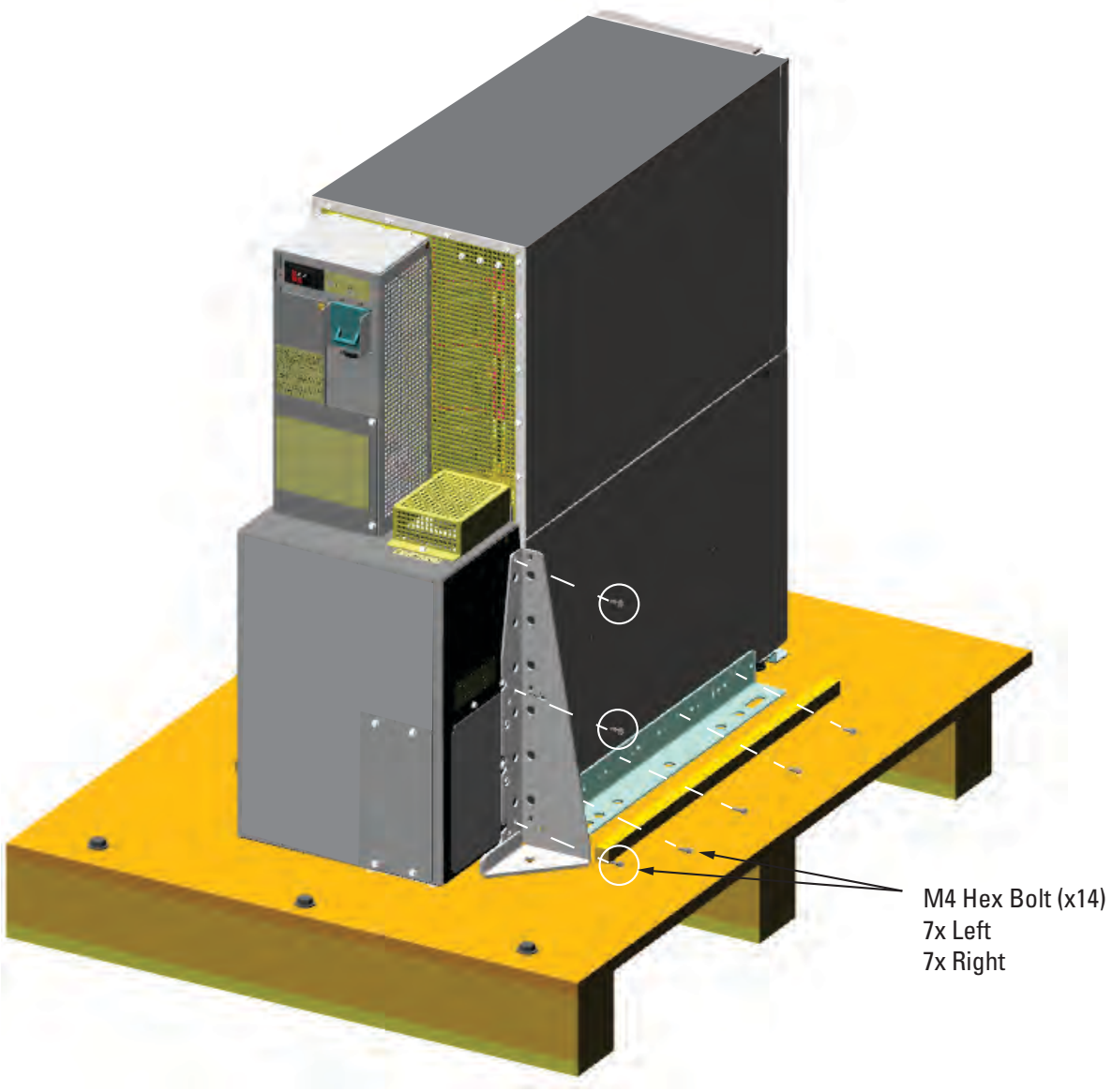
1. Remove the M10 bolt securing each vertical bracket to the pallet, see Figure 19.

Figure 19. Removing the Bracket to Pallet Mounting Bolts



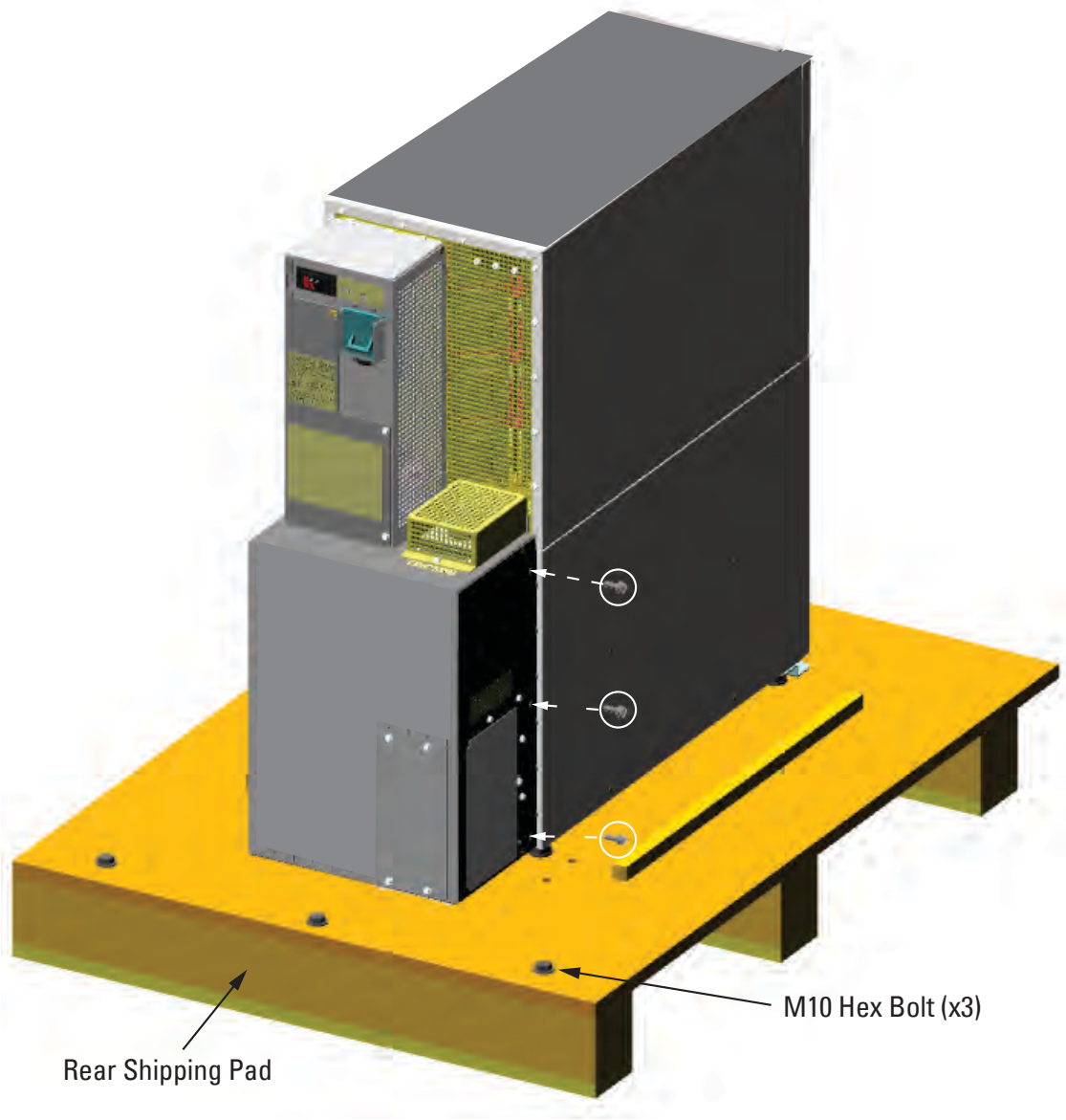
2. Remove the three M10 bolts securing each pallet mounting bracket to the pallet.
3. Remove and retain the three M4 screws securing each vertical bracket to the UPS, see Figure 20. Remove the brackets.

Figure 20. Removing the Bracket to Cabinet Bolts



4. Remove the four M4 bolts securing each pallet mounting bracket to the UPS. Remove the brackets.
5. Reinstall the M4 bolts to the Left and Right rear sides of the UPS, see Figure 21.

Figure 21. Reinstall Vertical Bracket M4 Bolts



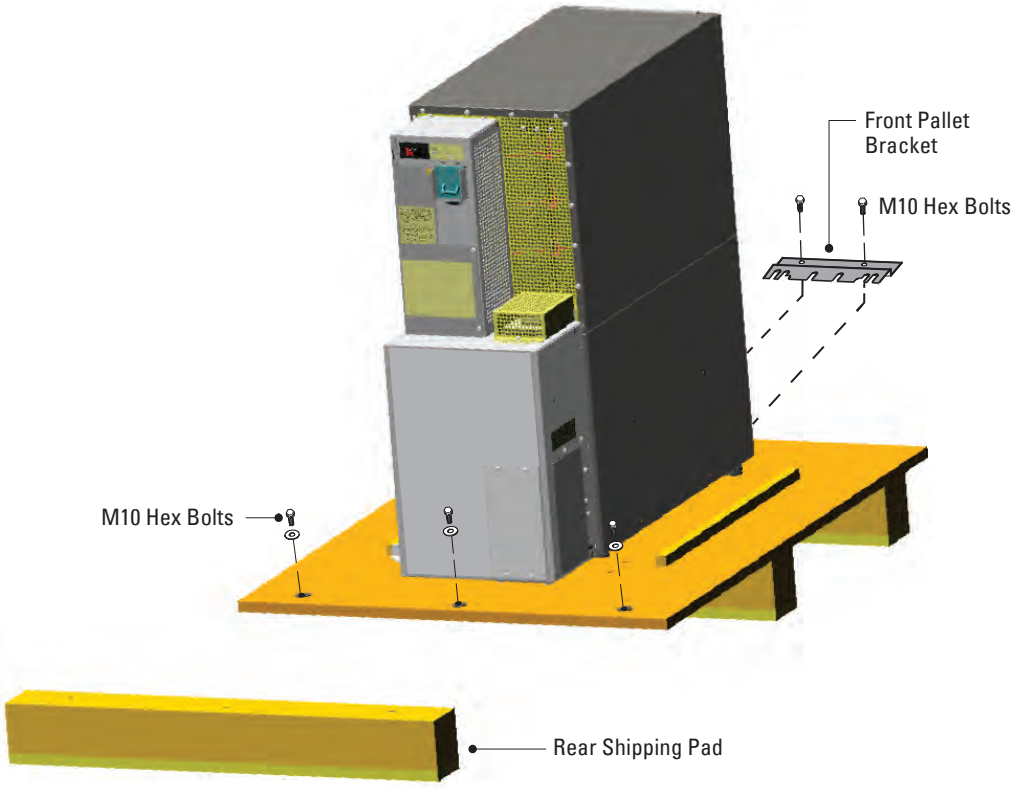
6. Remove the front cover from the bottom cabinet to access the front shipping bracket.

   Press and release the handle latch at the bottom of the cover and then lift the cover up and off the cabinet.

7. Remove the three M10 bolts securing the rear shipping pad to the pallet and remove the shipping pad, see Figure 22.

NOTE Hold the back of the cabinet so that the bolts can be removed easily without the cabinet rolling backward.

Figure 22. Removing the Front Shipping Bracket and Shipping Pad



8. Remove the two M10 bolts securing the front pallet bracket and remove the bracket.

   If needed, adjust the leveling feet to release the bracket.

9. Reinstall the front cover removed in Step 6.

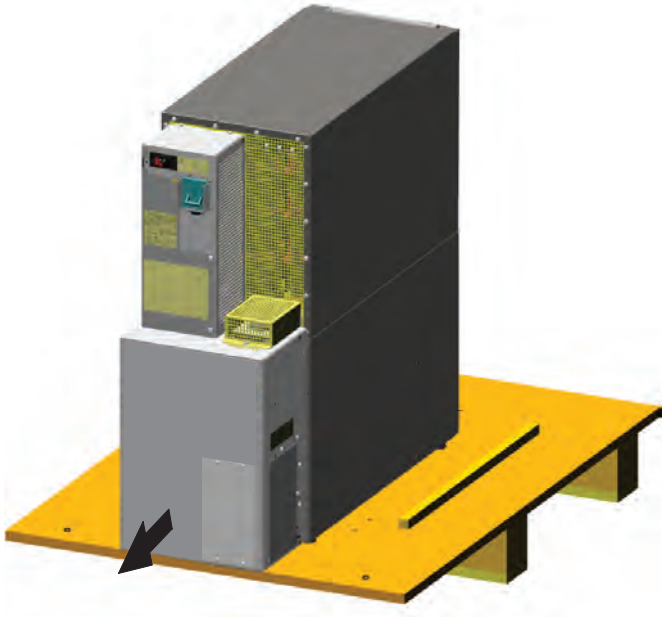
   Hang the top edge of the cover on the cabinet first, then lower the bottom edge and snap into place.

NOTE Support the front and back of the cabinet when rolling it off the pallet to prevent tipping.

10. Slowly roll the cabinet toward the rear of the pallet. Once the pallet tilts, continue rolling the cabinet down the pallet until the cabinet touches the floor, see Figure 23.

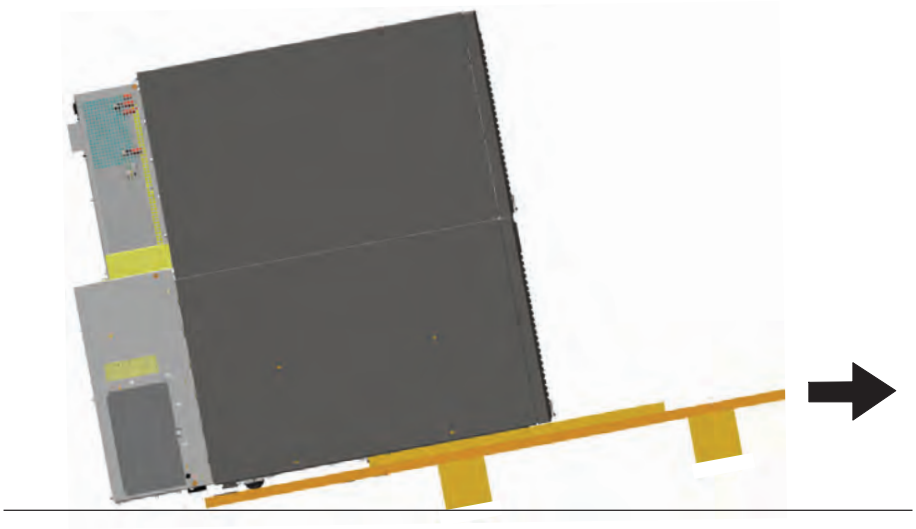
    If needed, adjust the leveling feet so that the cabinet rolls freely.

Figure 23. Unloading the Cabinet



11. With the cabinet supported, slowly pull the pallet away from the cabinet, see Figure 24.

Figure 24. Removing the Pallet



12. Roll the cabinet to the desired location.
13. Proceed to paragraph *4.3 External AC Power Wiring Installation*.

4.3 External AC Power Wiring Installation

4.3.1 Selecting an Installation Option

You are now ready to install the Eaton 9355 UPS. Select one of the following installation options according to your UPS configuration:

UPS Configuration	Paragraph Section
UPS only	4.3.2 *UPS and UPS with Input Isolation Transformer Power Wiring Installation*
UPS with an input isolation transformer	4.3.2 *UPS and UPS with Input Isolation Transformer Power Wiring Installation*
UPS with a version 1 wall-mounted bypass switch	4.3.3 *UPS with a Version 1 Wall-Mounted Bypass Switch*
UPS with a version 2 wall-mounted bypass switch	4.3.4 *UPS with a Version 2 Wall-Mounted Bypass Switch*
Parallel UPS configuration	Refer to the *Eaton 9355 Parallel UPS (10/15 kVA) User's Guide*.

4.3.2 UPS and UPS with Input Isolation Transformer Power Wiring Installation

The Eaton 9355 UPS has the following power connections:

- 3–phase (L1, L2, and L3), neutral, and ground connection for rectifier/bypass input
- 3–phase (L1, L2, and L3), neutral, and ground connection for load output

The nominal input/output voltages are:

- 120/208 or 127/220 Vac
- 480V or 600V 60-Hz input is available using the optional input isolation transformer module

Output overcurrent protection and disconnect switch must be provided by others.

Figure 56 through Figure 58 show the oneline diagrams.

⚠WARNING

Only qualified service personnel (such as a licensed electrician) should perform the UPS installation. Initial startup must be performed by an authorized Eaton Customer Service Engineer. Risk of electrical shock.

To hardwire the UPS:

1. Verify that the electrical connections to the installation site have been properly installed.
2. A wall-mounted, user–supplied, readily–accessible disconnection device must be incorporated in the input wiring.

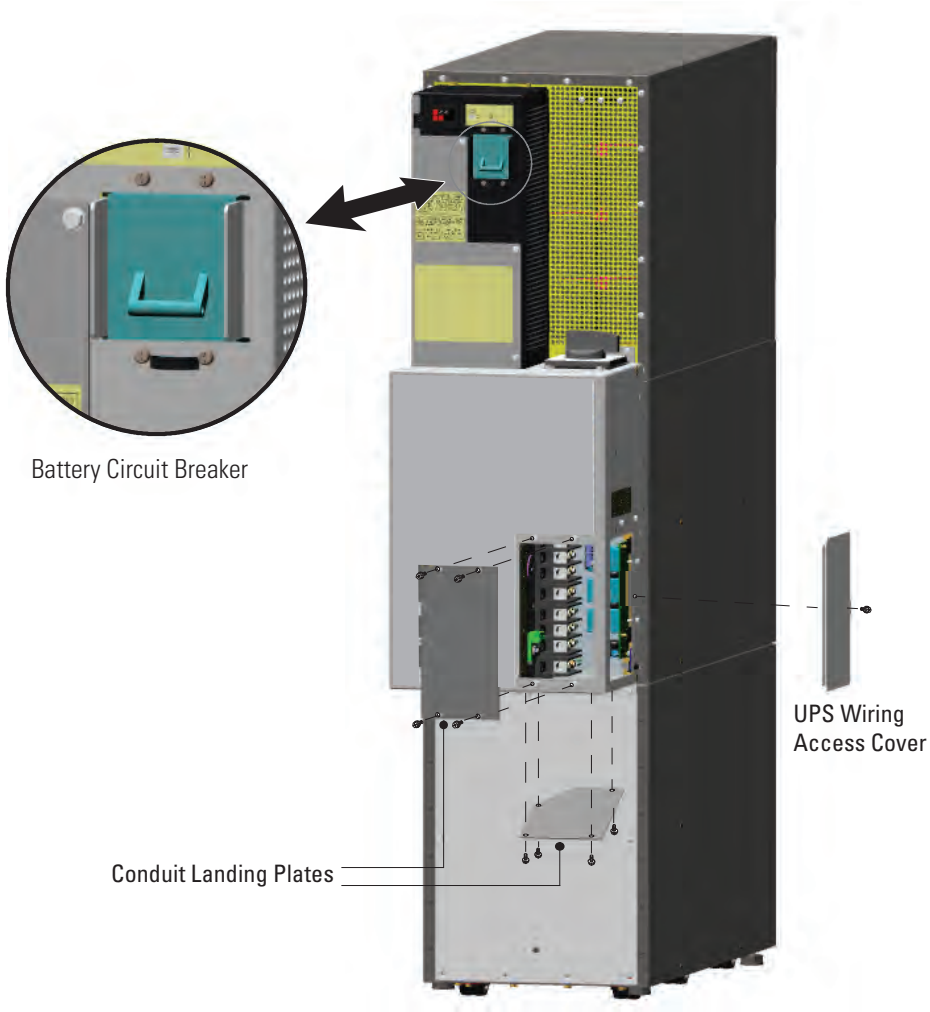
   Compare the circuit breaker ratings to the ones in Table 4.

NOTE To accommodate the feature of easy system expandability, it is recommended that initial installation of the Eaton 9355 UPS contain wiring to support the maximum capacity of the UPS cabinet.

3. Switch off utility power to the distribution point where the UPS will be connected. Be absolutely sure there is no power.
4. Determine your equipment's grounding requirements according to your local electrical code.

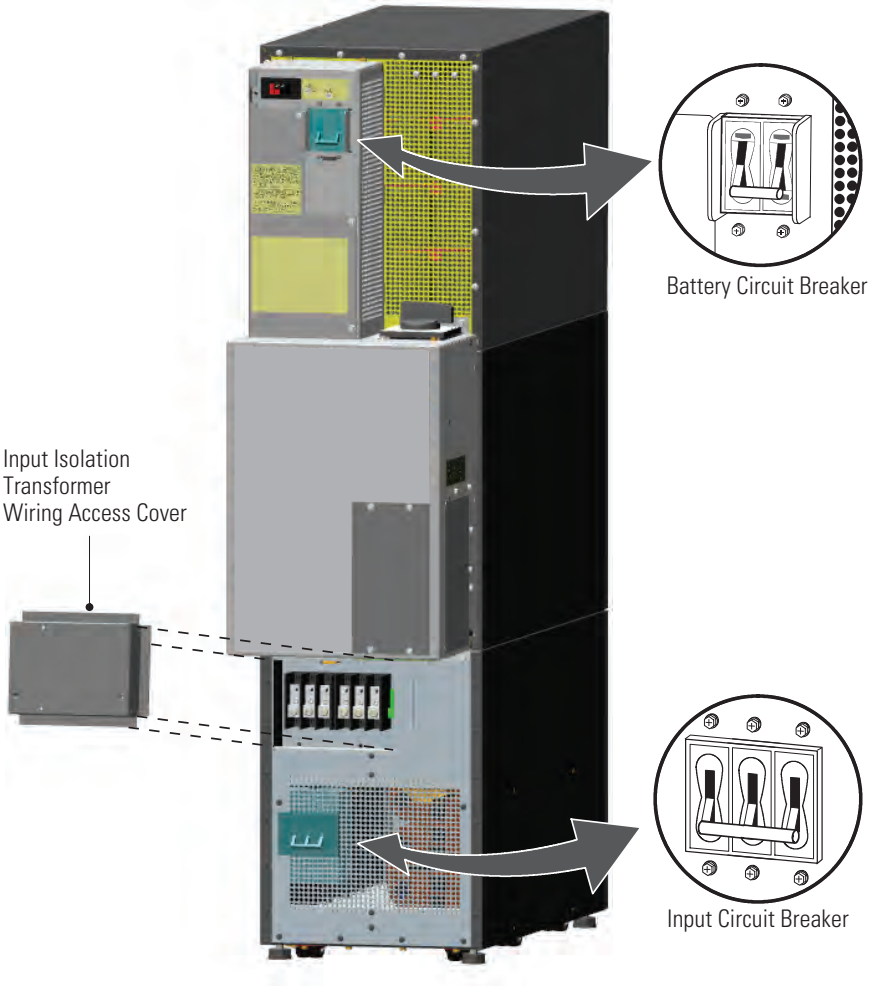
5. Verify that the UPS battery circuit breaker is in the OFF position (see Figure 25).

Figure 25. UPS Rear View (3-High Shown)



6. For UPS only installations, proceed to Step 7; for UPS installations with an input isolation transformer, proceed to Step 10.
7. Remove the UPS wiring access cover and one of the conduit landing plates and retain (see Figure 25).
8. Punch two holes in the conduit landing plate for the input and output conduit using a Greenlee® punch or similar device.
9. Proceed to Step 12.
10. Verify that the input circuit breaker is in the OFF position (see Figure 26).
11. Remove the input isolation transformer wiring access cover and retain.

Figure 26. UPS with Input Isolation Transformer Rear View



12. Hardwire the input, output, and ground terminations for the UPS or input isolation transformer. See Table 4 for wiring specifications.

    For a detailed view of the terminal block, see Figure 27 or Figure 28.

	NOTE 1	Input neutral must be wired for proper operation. Failure to connect an input neutral will void the warranty. If the optional input transformer is installed, an input neutral is not required.
	NOTE 2	The Eaton 9355 UPS is a single-feed UPS only.

Figure 27. UPS Terminal Block (3-High Shown)

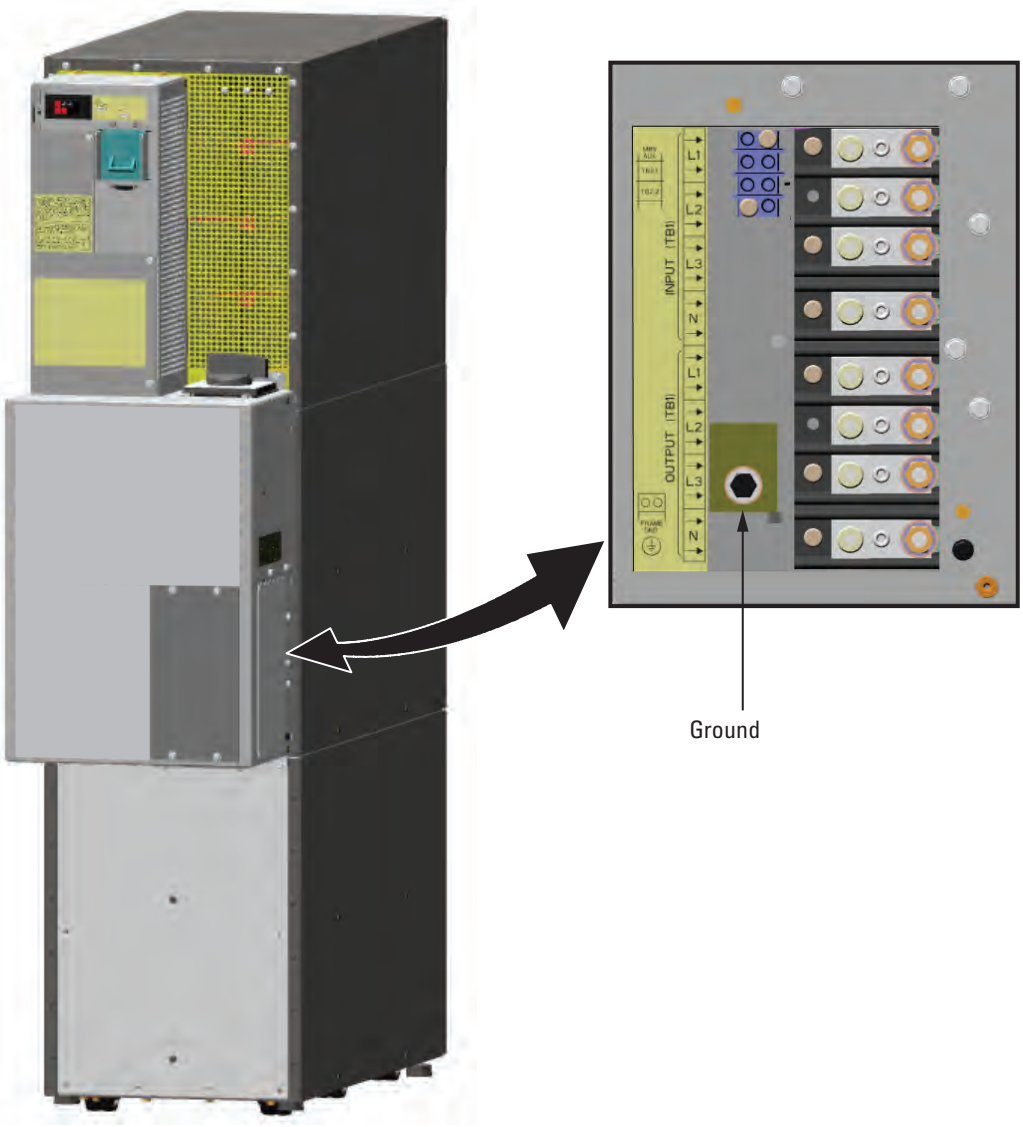
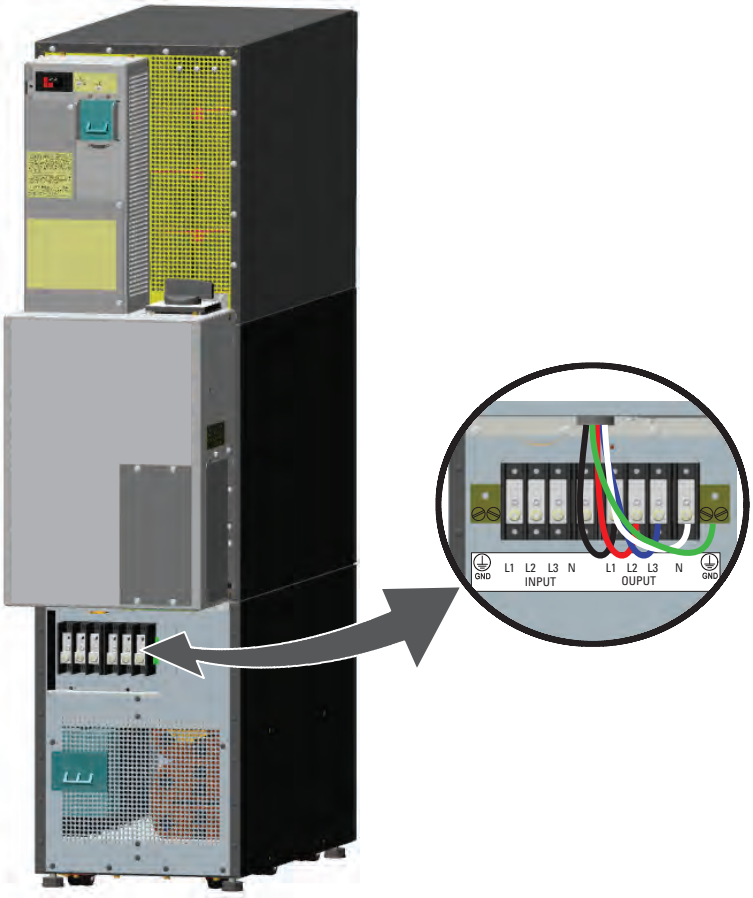


Figure 28. Input Isolation Transformer Terminal Block



13. For UPS only installations, replace the UPS wiring access cover and conduit landing plate.

    For UPS installations with an input isolation transformer, replace the transformer wiring access cover.

14. Proceed to to complete the UPS installation.

4.3.3 UPS with a Version 1 Wall-Mounted Bypass Switch

This chapter describes installing the wall-mounted bypass switch with the UPS. The wall-mounted bypass switch is a Make-Before-Break (MBB) maintenance bypass switch.

NOTE The input isolation transformer cannot be used with the wall-mounted bypass switch.

The Eaton 9355 UPS has the following power connections:

- 3–phase (L1, L2, and L3), neutral, and ground connection for rectifier/bypass input
- 3–phase (L1, L2, and L3), neutral, and ground connection for load output

The nominal input/output voltages are:

- 120/208 or 127/220 Vac

Output overcurrent protection and disconnect switch must be provided by others.

Figure 59 and Figure 60 show the oneline diagrams.

⚠WARNING

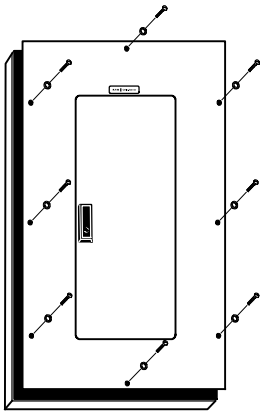
Only qualified service personnel (such as a licensed electrician) should perform the UPS installation. Initial startup must be performed by an authorized Eaton Customer Service Engineer. Risk of electrical shock.

To hardwire the bypass cabinet:

1. Verify that the electrical connections to the installation site have been properly installed.
2. A wall-mounted, user–supplied, readily–accessible disconnection device must be incorporated in the input wiring.

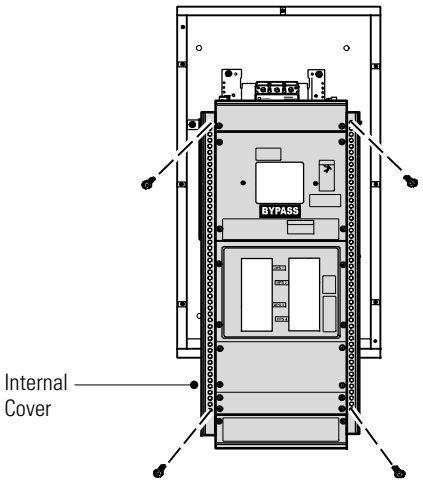
   Compare the circuit breaker ratings to the ones in Table 5.
3. Switch off utility power to the distribution point where the bypass cabinet and UPS will be connected. Be absolutely sure there is no power.
4. Determine your equipment's grounding requirements according to your local electrical code.
5. Remove the bypass cabinet front cover (see Figure 29).

Figure 29. Version 1 Bypass Cabinet Front Cover



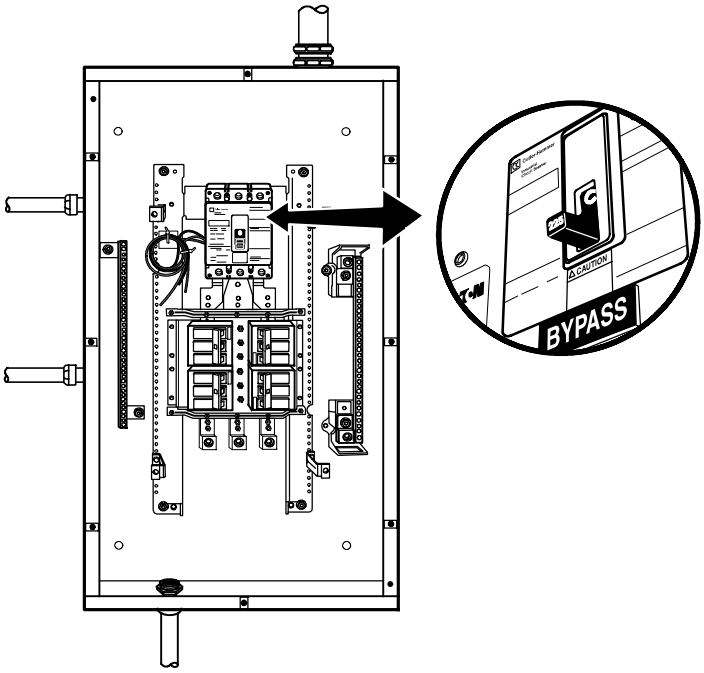
6. Remove the internal cover to gain access to the breakers (see Figure 30).

Figure 30. Version 1 Internal Cover



7. Punch holes for the conduit (AC input, UPS output, load connection, and maintenance bypass contact wires) using a Greenlee punch or similar device.
8. Verify that the bypass breaker is in the OFF position (see Figure 31).
9. Mount the bypass cabinet to the wall and install the conduit.

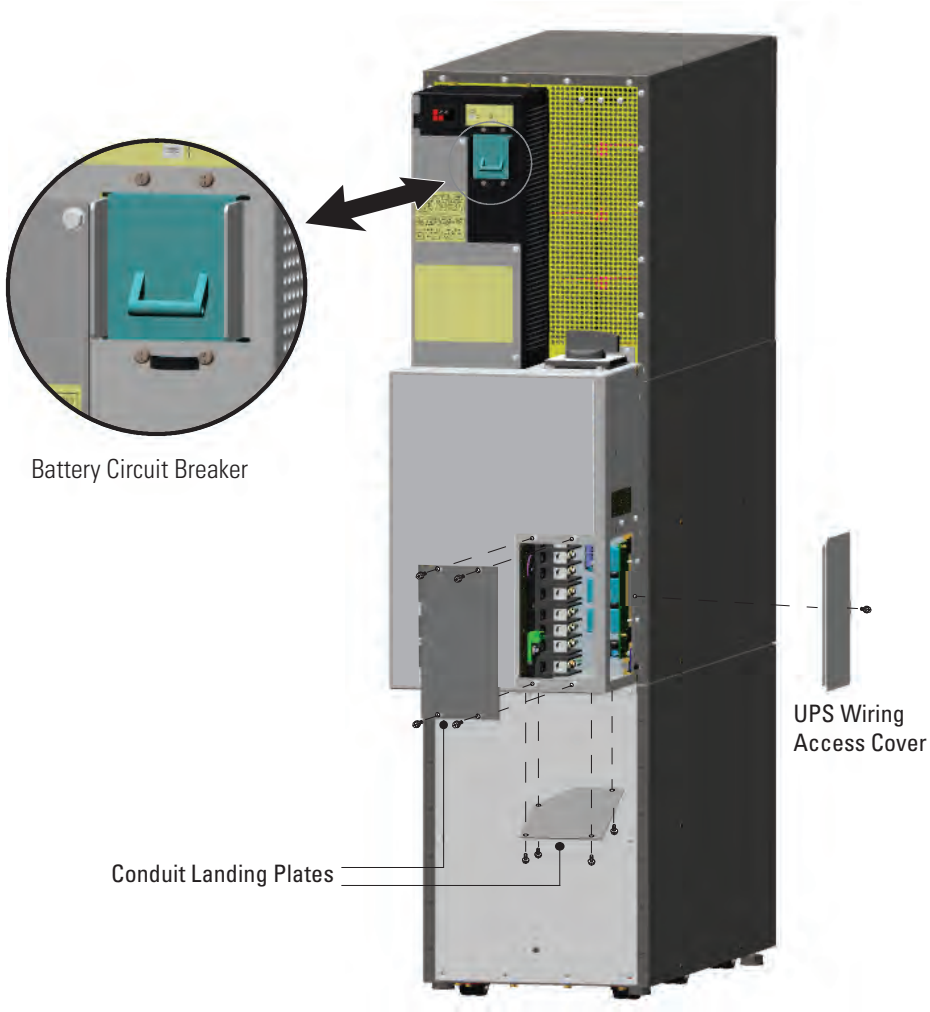
Figure 31. Version 1 Bypass Breaker



10. Verify that the UPS battery circuit breaker is in the OFF position (see Figure 32).
11. Remove the UPS wiring access cover and one of the conduit landing plates and retain.

12. Punch two holes in the conduit landing plate for the input and output conduit using a Greenlee punch or similar device.

Figure 32. UPS Rear View (3-High Shown)

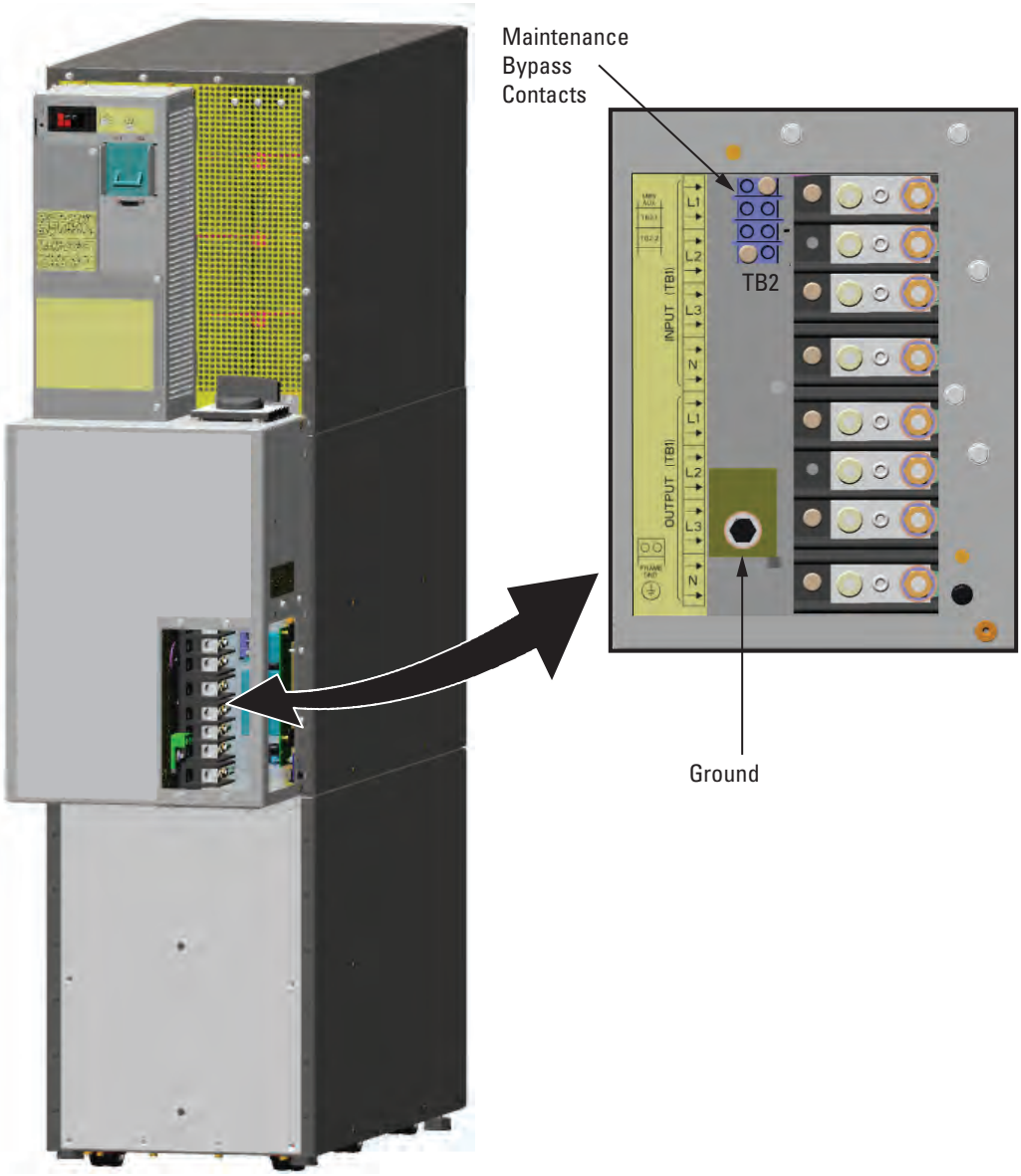


13. Hardwire the UPS input terminations.

    See Table 5 for specifications and Figure 33 for a detailed view of the UPS terminal block.

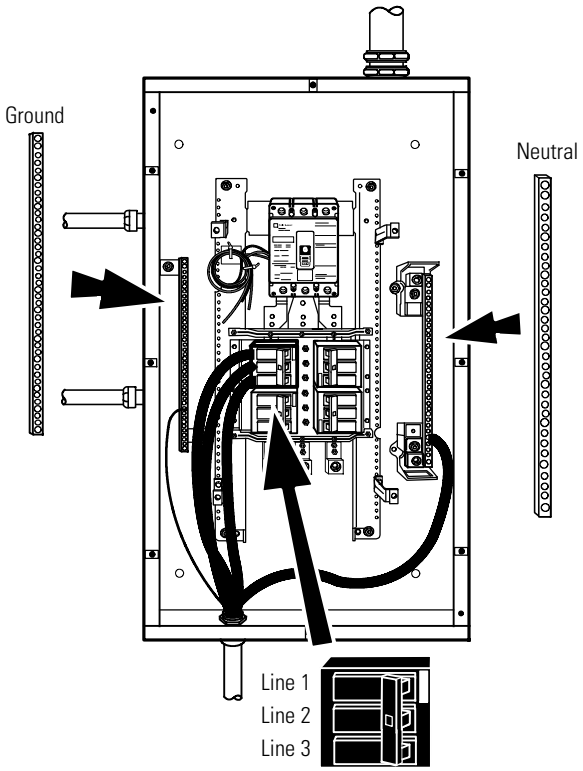
	NOTE 1	Input neutral must be wired for proper operation. Failure to connect an input neutral will void the warranty. If the optional input transformer is installed, an input neutral is not required.
	NOTE 2	The Eaton 9355 UPS is a single-feed UPS only.

Figure 33. UPS Terminal Block (3-High Shown)



14. Hardwire the output terminations from the UPS to the bypass cabinet (see Figure 34).

Figure 34. Version 1 UPS Output to Bypass Cabinet Wiring



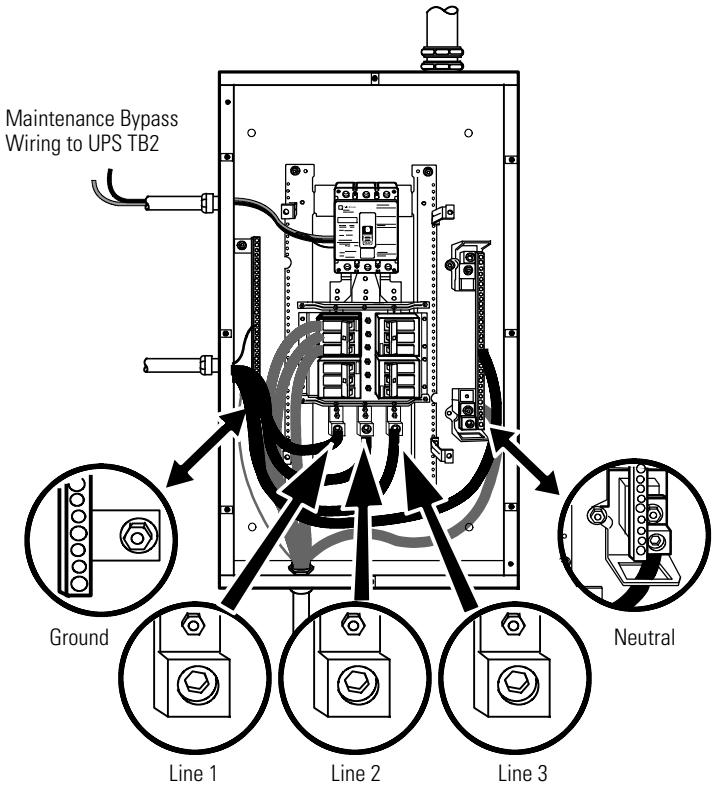
15. Hardwire the load to the bypass cabinet (see Figure 35).
16. Route the maintenance bypass wires through the conduit to the UPS terminal block (see Figure 33).

    Connect the black and the red wire to TB2 on the UPS. Cap the blue wire.

NOTE The maintenance bypass contacts are normally-open. To ensure proper bypass operation, DO NOT use the blue wire (it is normally-closed).

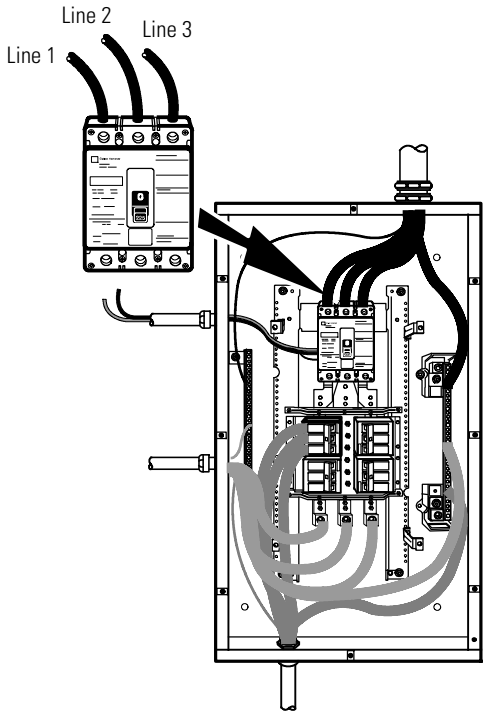
17. Replace the UPS wiring access cover and conduit landing plate.

Figure 35. Version 1 Load Connections



18. Wire the AC input to the bypass breaker (see Figure 36).

Figure 36. Version 1 Bypass AC Input Wiring



19. Verify the bypass input.
20. Reinstall the internal cover.
21. Reinstall the bypass cabinet front cover.
22. Proceed to 4.4 *Stabilizing the Cabinet* to complete the UPS installation.

4.3.4 UPS with a Version 2 Wall-Mounted Bypass Switch

This chapter describes installing the wall-mounted bypass switch with the UPS. The wall-mounted bypass switch is a Make-Before-Break (MBB) maintenance bypass switch.

NOTE The input isolation transformer cannot be used with the wall-mounted bypass switch.

The Eaton 9355 UPS has the following power connections:

- 3–phase (L1, L2, and L3), neutral, and ground connection for rectifier/bypass input
- 3–phase (L1, L2, and L3), neutral, and ground connection for load output

The nominal input/output voltages are:

- 120/208 or 127/220 Vac

  Output overcurrent protection and disconnect switch must be provided by others.

  Figure 61 through Figure 63 show the oneline diagrams.

⚠WARNING

Only qualified service personnel (such as a licensed electrician) should perform the UPS installation. Initial startup must be performed by an authorized Eaton Customer Service Engineer. Risk of electrical shock.

To hardwire the bypass cabinet:

1. Verify that the electrical connections to the installation site have been properly installed.
2. A wall-mounted, user–supplied, readily–accessible disconnection device must be incorporated in the input wiring.

   Compare the circuit breaker ratings to the ones in Table 6.
3. Switch off utility power to the distribution point where the bypass cabinet and UPS will be connected. Be absolutely sure there is no power.
4. Determine your equipment's grounding requirements according to your local electrical code.
5. Unfasten the bypass cabinet front door latch and swing the door open (see Figure 37).
6. Follow the instructions on the inside of the door to open or remove the front cover (see Figure 37 and Figure 38).

Figure 37. Version 2 Bypass Cabinet Front Door and Cover

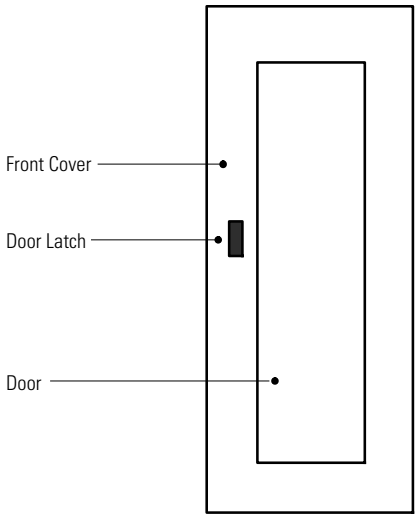
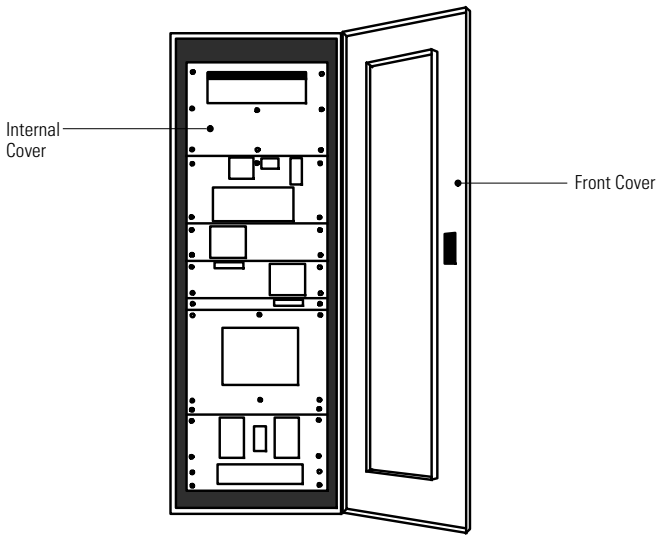
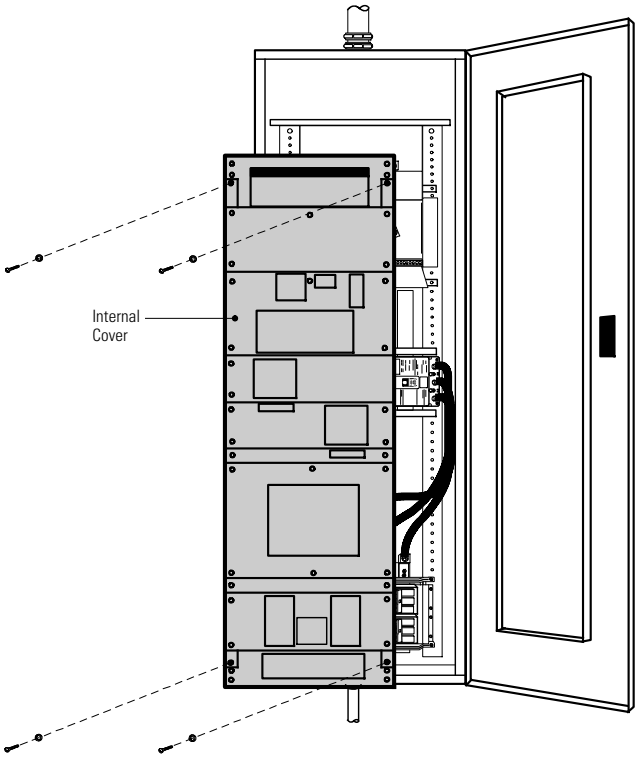


Figure 38. Version 2 Bypass Cabinet Front Cover Open



7. Remove the internal cover to gain access to the breakers (see Figure 39).

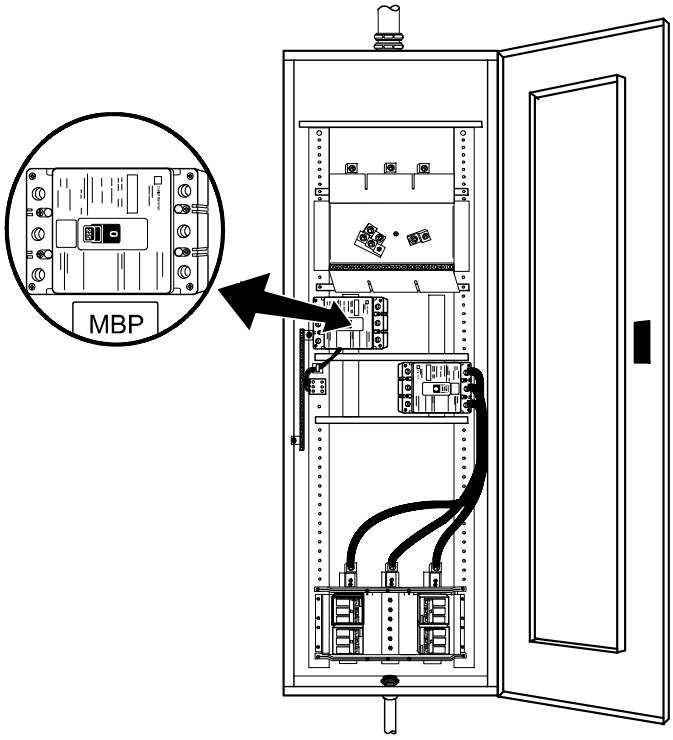
Figure 39. Version 2 Bypass Cabinet Internal Cover



8. Punch holes for the conduit (AC input, UPS output, load connection, and maintenance bypass contact wires) using a Greenlee punch or similar device.

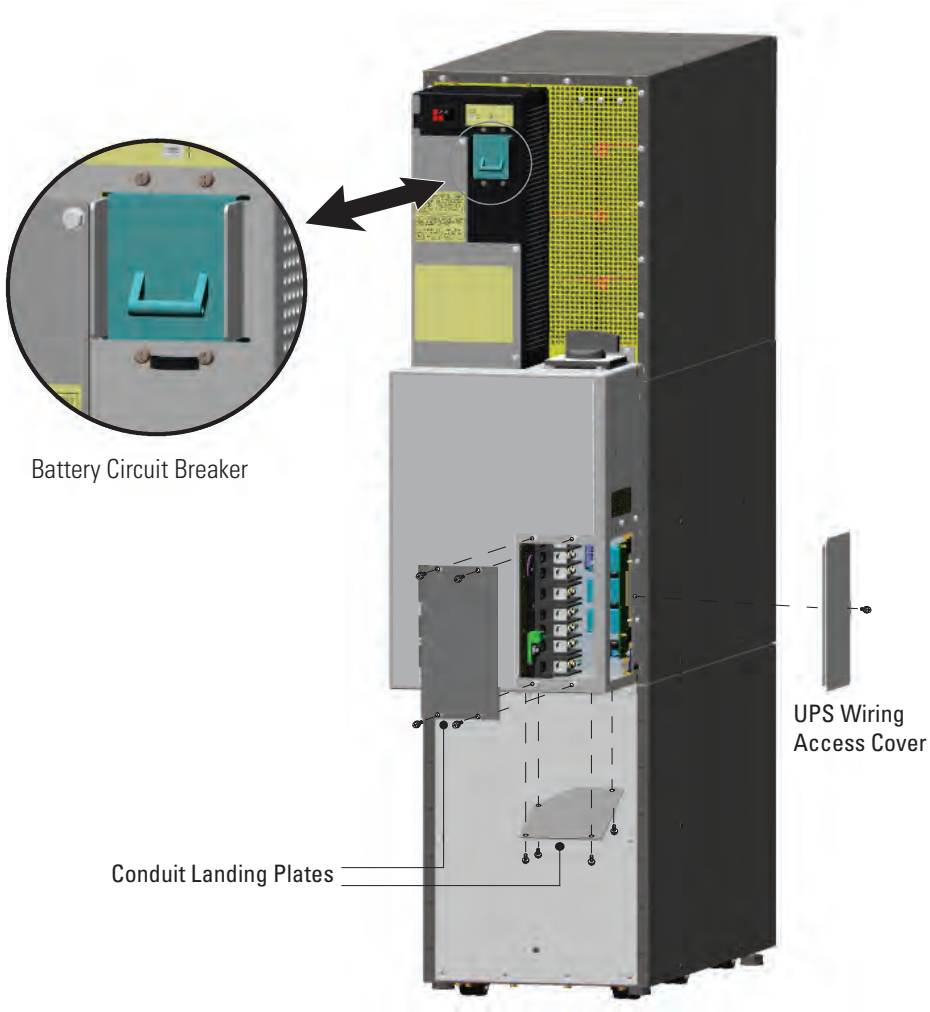
9. Verify that the bypass breaker is in the OFF position (see Figure 40).
10. Mount the bypass cabinet to the wall and install the conduit.

Figure 40. Version 2 Bypass Cabinet Bypass Breaker



11. Verify that the UPS battery circuit breaker is in the OFF position (see Figure 41).
12. Remove the UPS wiring access cover and one of the conduit landing plates and retain.
13. Punch two holes in the conduit landing plate for the input and output conduit using a Greenlee® punch or similar device.

Figure 41. UPS Rear View (3-High Shown)

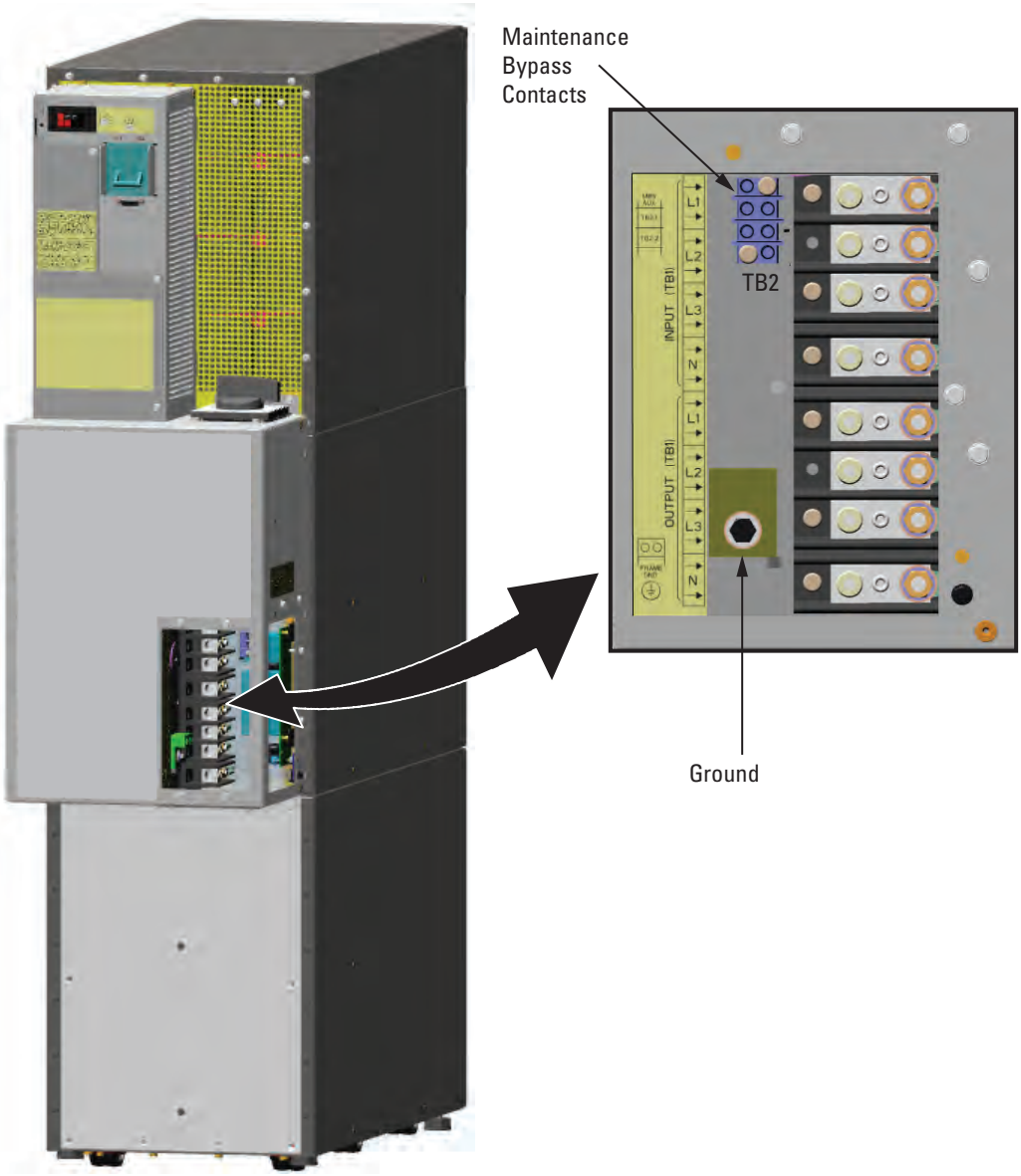


14. Hardwire the UPS input terminations.

    See Table 6 for specifications and Figure 42 for a detailed view of the UPS terminal block.

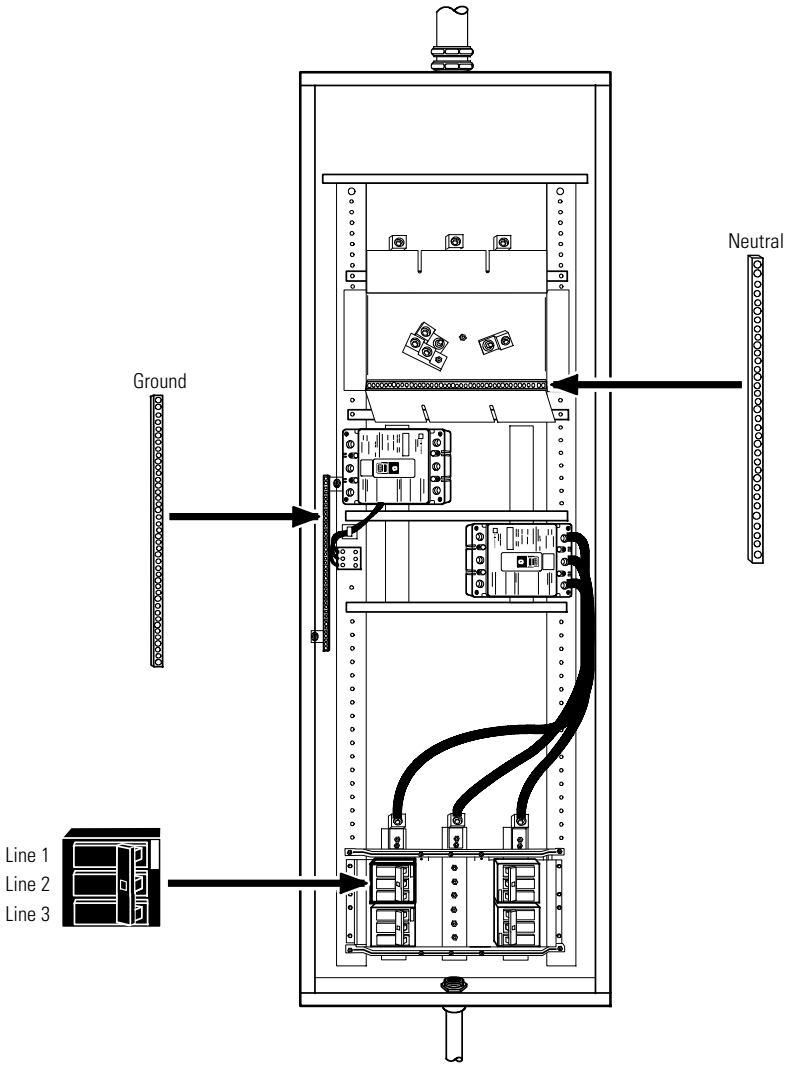
	NOTE 1	Input neutral must be wired for proper operation. Failure to connect an input neutral will void the warranty. If the optional input transformer is installed, an input neutral is not required.
	NOTE 2	The Eaton 9355 UPS is a single-feed UPS only.

Figure 42. UPS Terminal Block (3-High Shown)



15. Hardwire the output terminations from the UPS to the bypass cabinet (see Figure 43).

Figure 43. Version 2 Bypass Cabinet UPS Output to Bypass Wiring



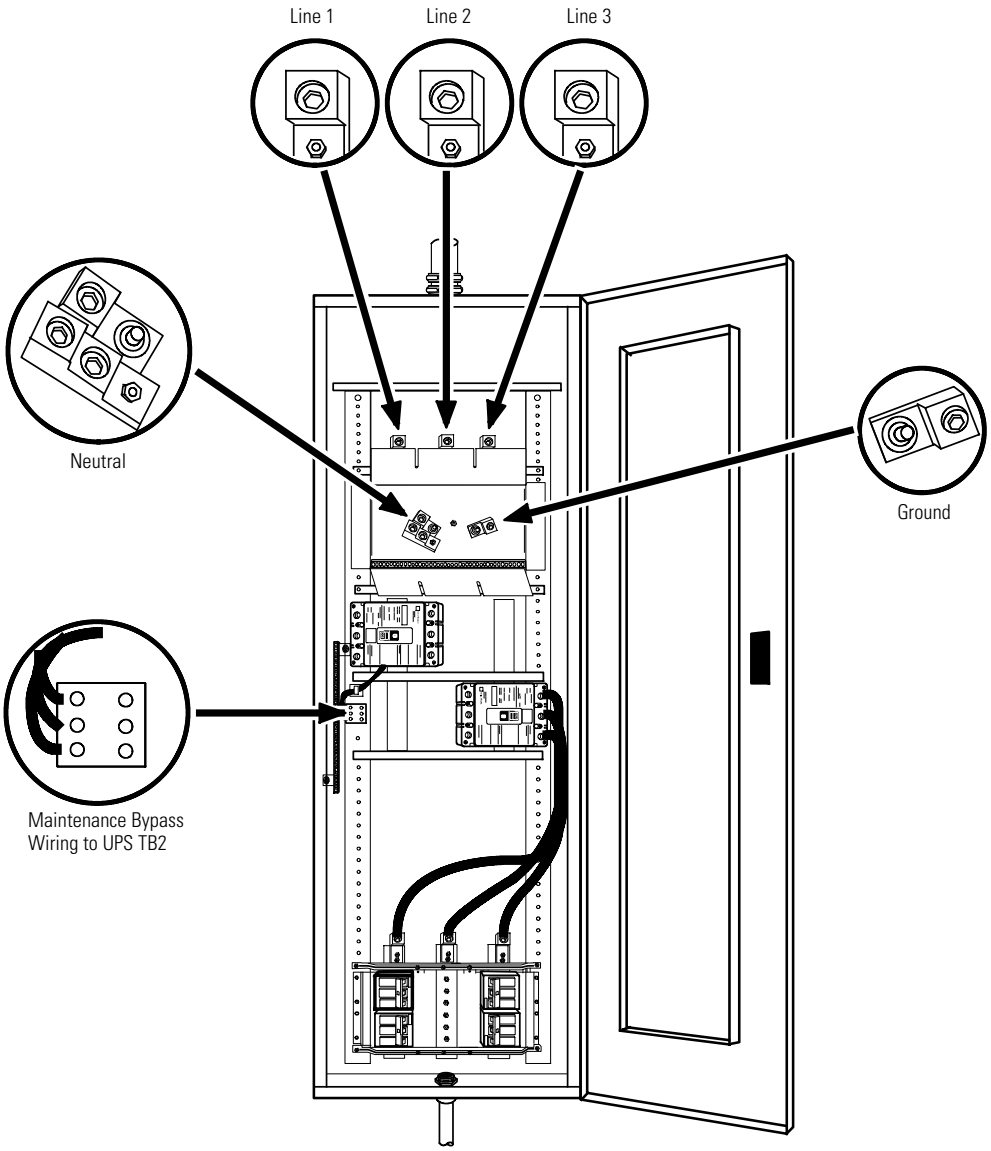
16. Hardwire the load to the bypass cabinet (see Figure 44).
17. Route the maintenance bypass wires through the conduit to the UPS terminal block (see Figure 42).

    Connect the black and the red wires from the terminal block on the Tie Cabinet to TB2 on the UPS.

NOTE The maintenance bypass contacts are normally-open. To ensure proper bypass operation, DO NOT use the blue wire (it is normally-closed).

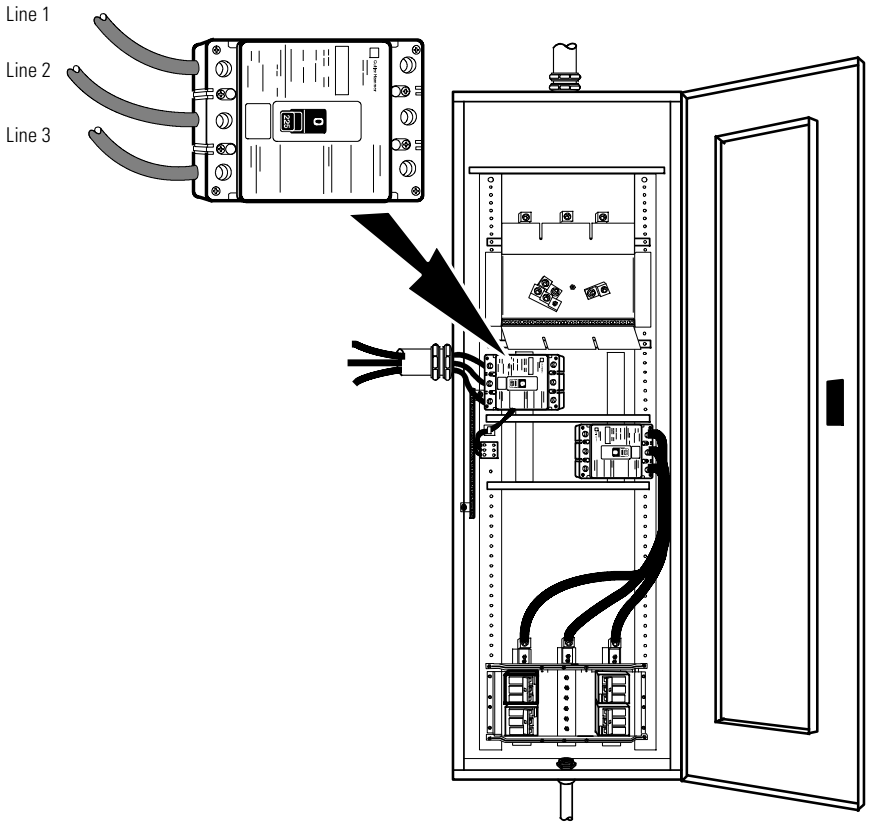
18. Replace the UPS wiring access cover and conduit landing plate.

Figure 44. Version 2 Bypass Cabinet Load Connections



19. Wire the AC input to the bypass breaker (see Figure 45).

Figure 45. Version 2 Bypass Cabinet Bypass AC Input Wiring



20. Verify the phase rotation for each UPS and the bypass input.
21. Reinstall the internal cover.
22. Reinstall the bypass cabinet front cover.
23. Proceed to 4.4 *Stabilizing the Cabinet* to complete the UPS installation.

4.4 Stabilizing the Cabinet

NOTE 1 For seismic installations, you MUST order and install an Eaton 9355 UPS seismic kit; do not use the following instructions.

NOTE 2 For non-seismic installations, you MUST install the stabilizing bracket on all 3-high cabinets. The stabilizing bracket is optional for 2-high cabinets.

To stabilize the cabinet(s):

1. Lower the leveling feet to prevent the cabinet from rolling.

Figure 46. Lowering the Leveling Feet

2. Attach the stabilizing bracket to the bottom of the cabinet rear panel using the retained hardware from the shipping pallet according to the cabinet configuration:
   - For one cabinet, see Figure 47.
   - For two cabinets, see Figure 48.
   - For three cabinets, see Figure 49.

NOTE No more than three cabinets can be attached together. For four cabinets, use two of the two-cabinet installations. For five cabinets, use one three-cabinet and one two-cabinet installation.

3. Use the holes and slots in the bottom of the bracket to attach the cabinet to the flooring if desired.
4. Continue to one of the following sections:
   - See paragraph 4.5 *Internal Battery Tray Wiring Connections* to connect the internal battery tray wiring.
   - See paragraph 4.6 *Extended Battery Module Installation* to install optional EBMs.
   - See Chapter 6 *Communication* to install UPS communication options, such as X-Slot cards or remote emergency power-off (REPO).

- See Chapter 7 *UPS Operating Instructions* to start up the UPS.

NOTE After UPS startup, ensure maximum battery runtime by configuring the UPS for the correct number of EBMs (see 7.6 *Configuring the UPS for EBMs*).

Figure 47. Stabilizing Bracket with One Cabinet

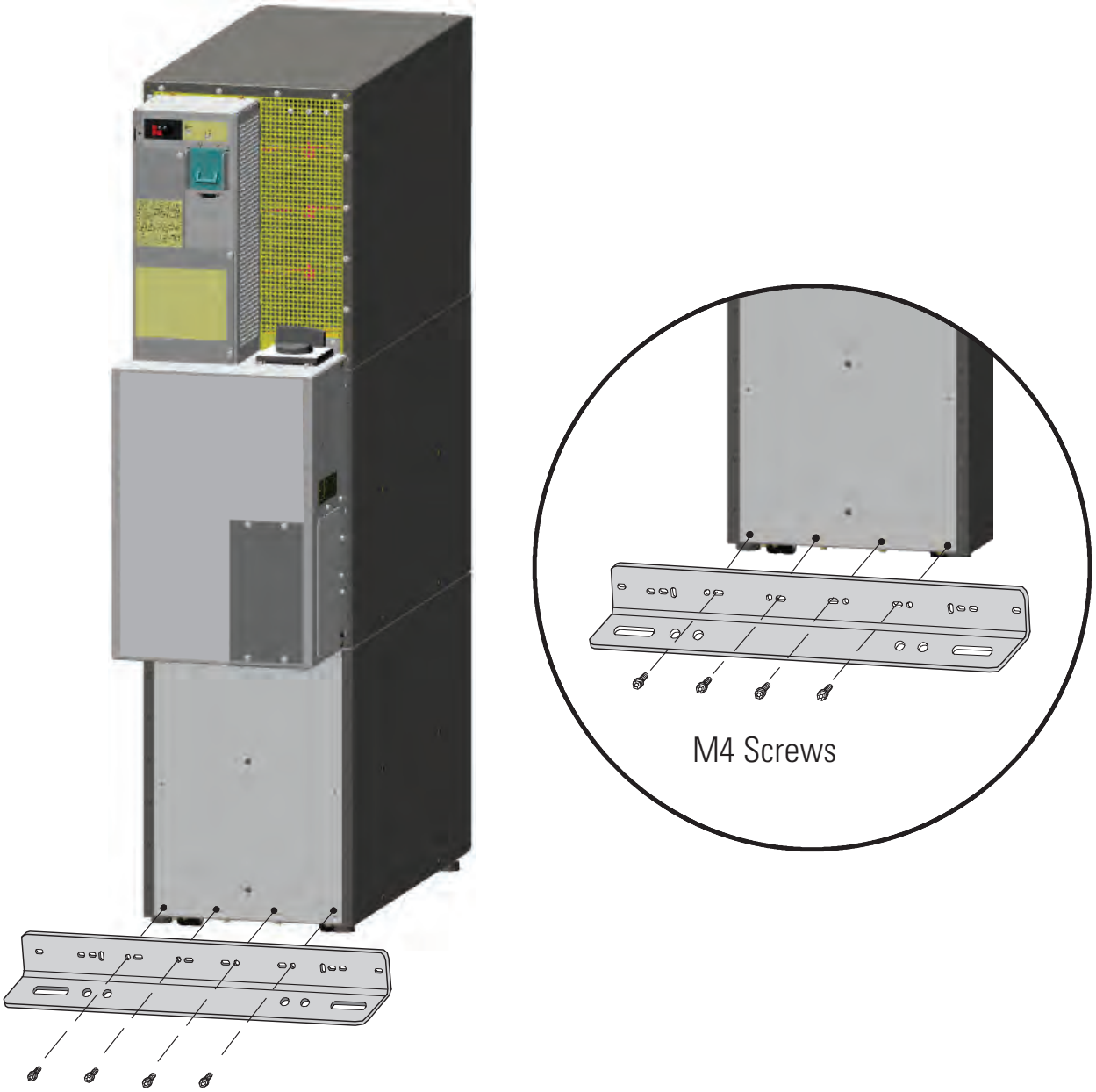


Figure 48. Stabilizing Bracket with Two Cabinets

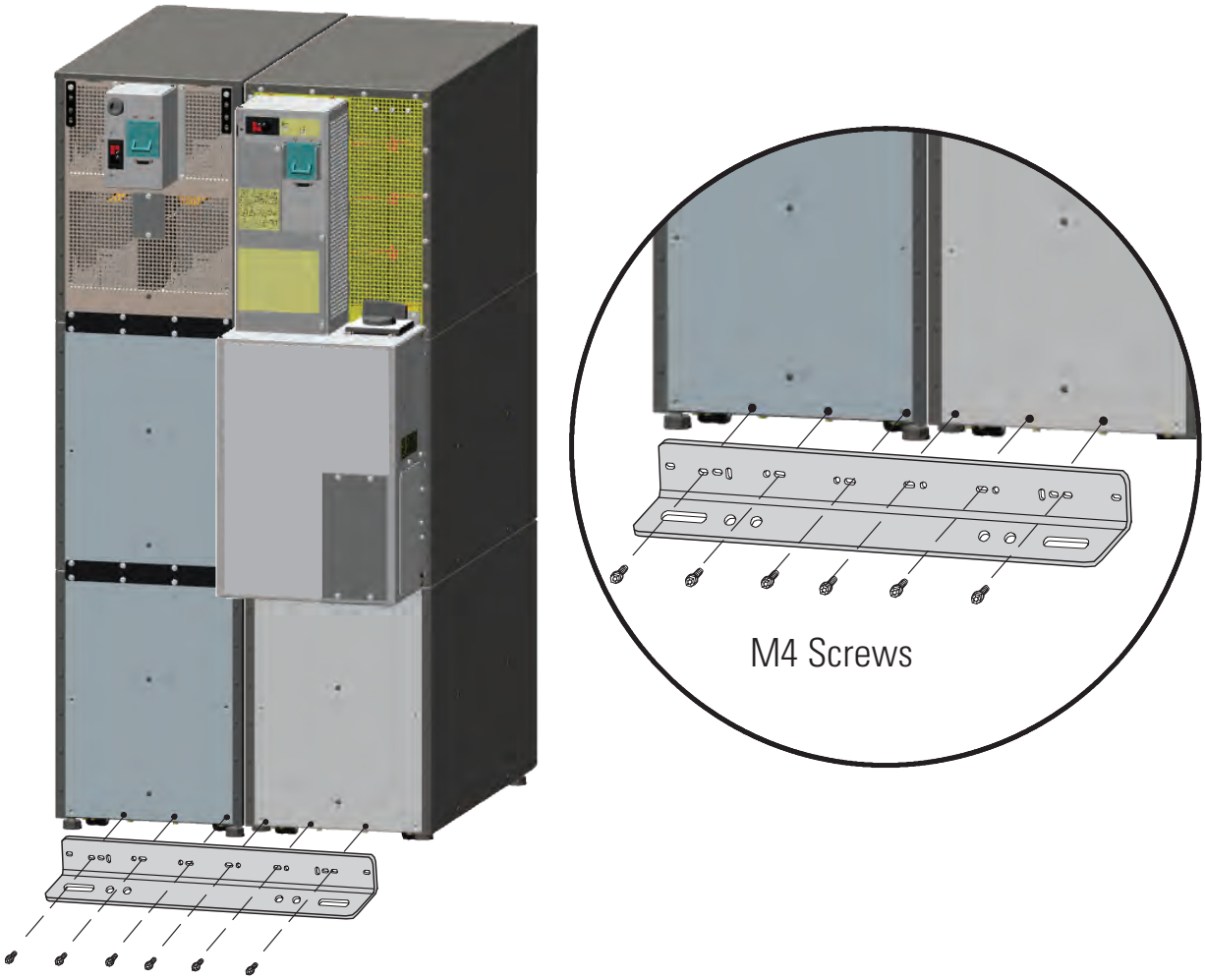
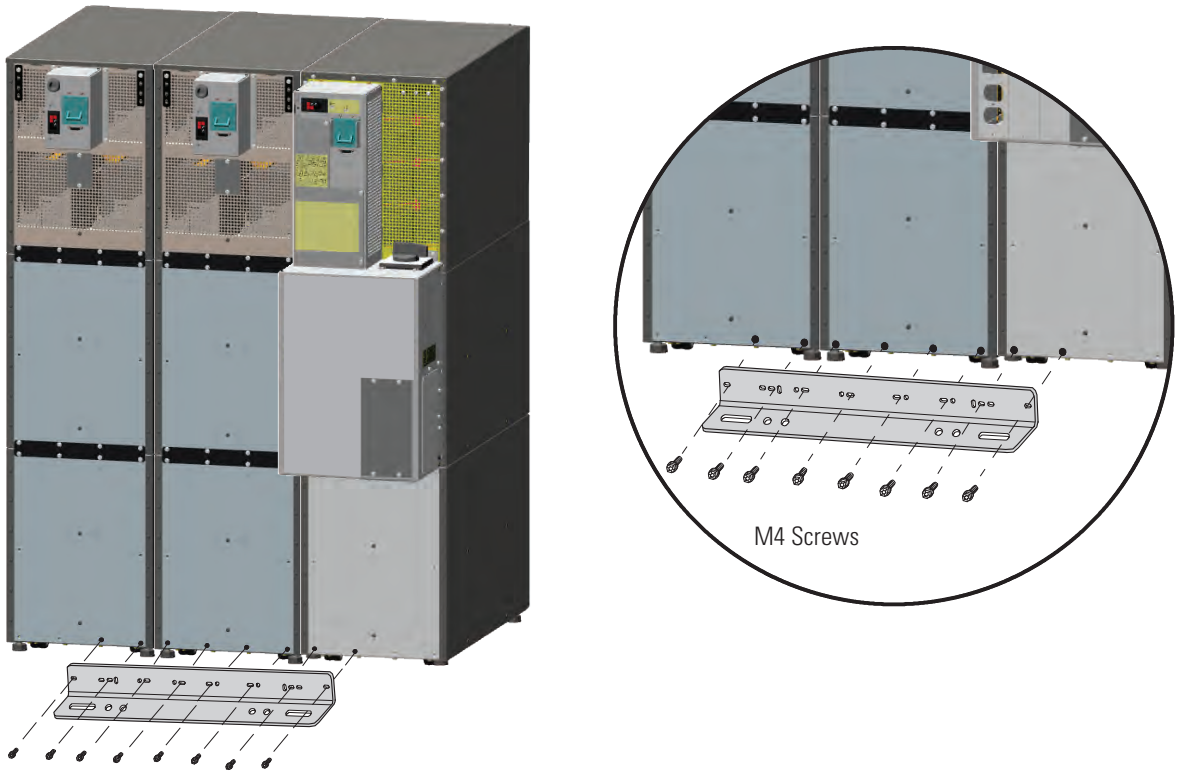


Figure 49. Stabilizing Bracket with Three Cabinets



4.5 Internal Battery Tray Wiring Connections

NOTE To reduce electrical safety risks during transportation, the UPS is shipped with the internal battery tray assemblies disconnected.

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

The UPS is intended to be operated only with batteries installed. When batteries are not installed a stabilizing bracket is required to prevent a tip hazard.

⚠WARNING

Only qualified service personnel (such as a licensed electrician) should perform the UPS installation. Initial startup must be performed by an authorized Eaton Customer Service Engineer. Risk of electrical shock.

⚠CAUTION

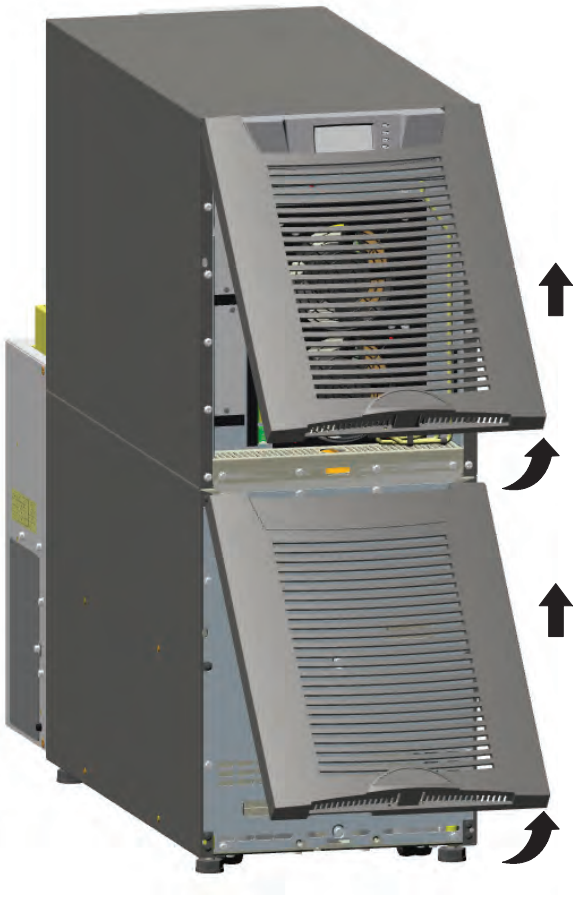
- Servicing should be performed by qualified service personnel knowledgeable of batteries and required precautions. Keep unauthorized personnel away from batteries.
- Batteries can present a risk of electrical shock or burn from high short circuit current. The following precautions should be observed: 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 voltage rated gloves and electrical hazard footwear.
- 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 of ground. Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock will be reduced if such grounds are removed during installation and maintenance.
- ELECTRIC ENERGY HAZARD. Do not attempt to alter any battery wiring or connectors. Attempting to alter wiring can cause injury.

To access and install the internal battery trays and wiring connections:

1. Verify that the input, output, and battery circuit breakers are in the OFF position
2. Remove the front covers of all cabinets, starting with the top cabinet.

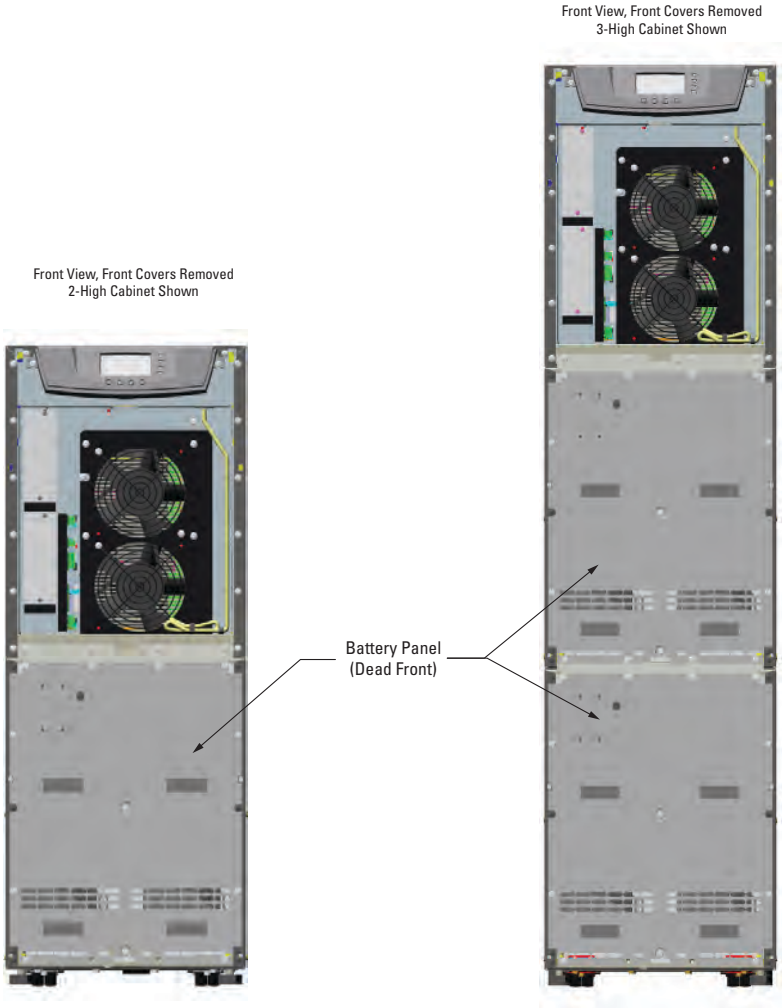
   Press and release the handle latch at the bottom of each cover and then lift the cover up and off the cabinet (see Figure 50).

Figure 50. Removing the Front Covers



3. The battery cover panel is made up of two parts joined together with four screws. Remove both parts of the panel at the same time by removing the 10 M4 screws on the edges of the panel and M4 screw in the middle of the panel (see Figure 51).

Figure 51. Battery Panel (Dead Front)



4. Connect the UPS battery wiring to the Battery tray wiring, red connector to red connector, black connector to black connector (see Figure 52 and Figure 53).

Figure 52. Internal Battery Tray Wiring Connections

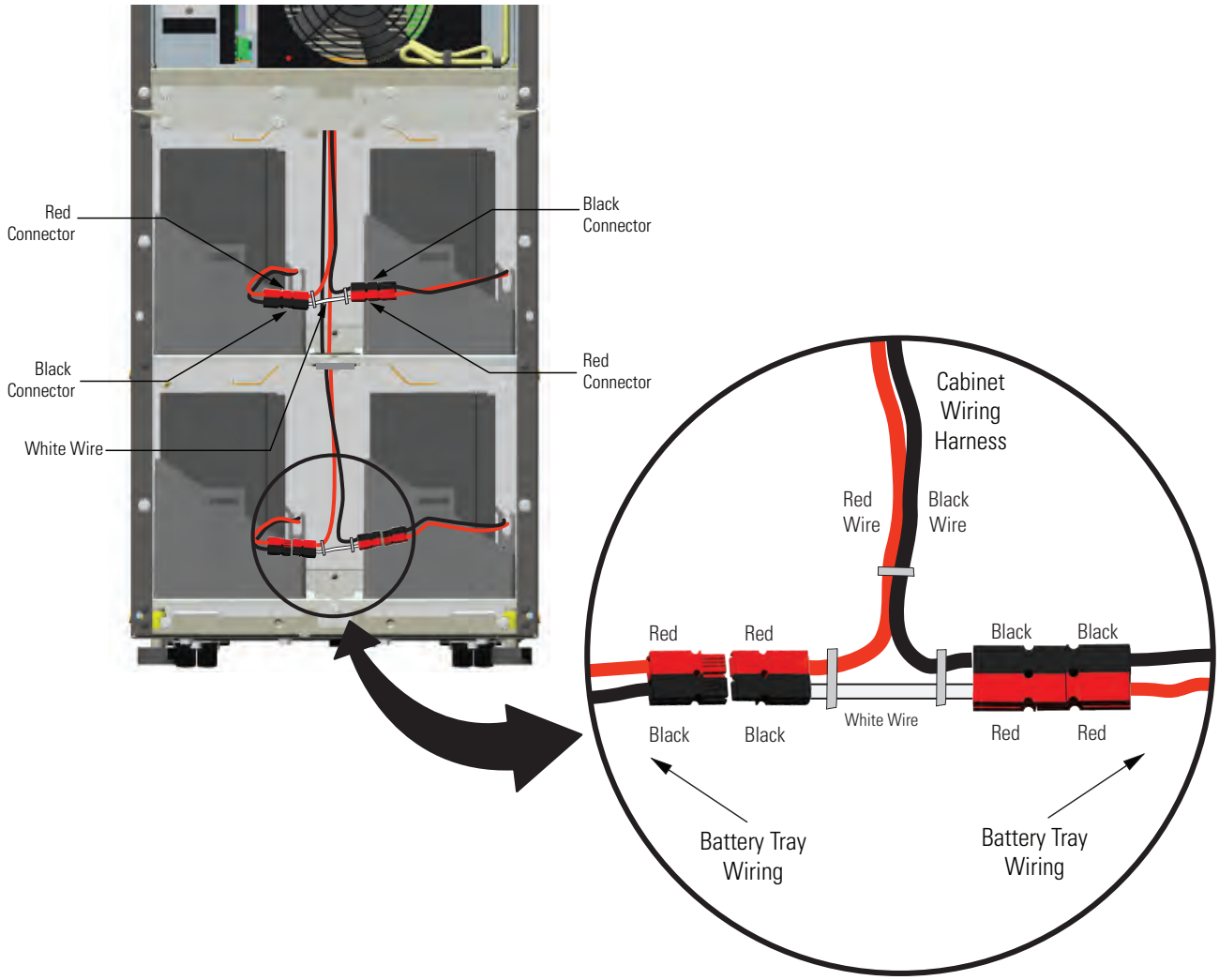
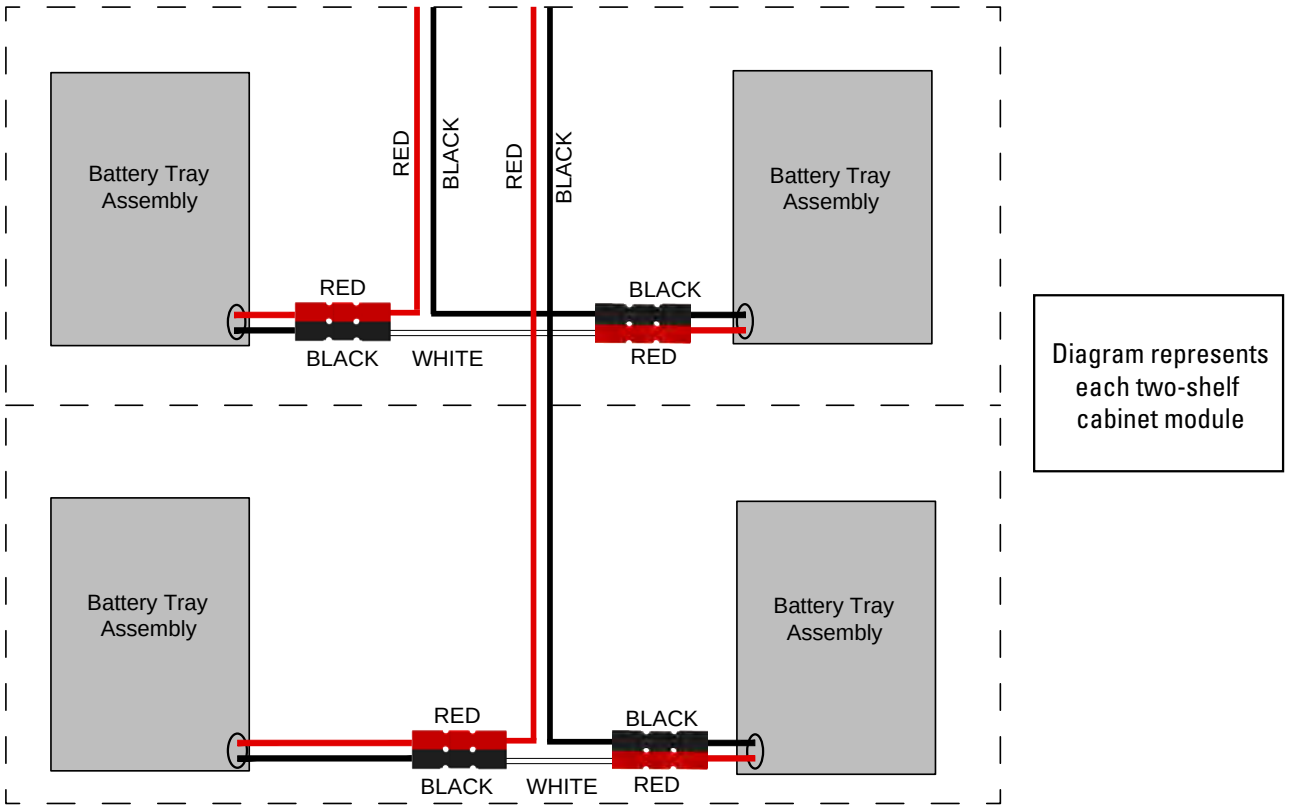


Figure 53. Internal Battery Tray Wiring Diagram



5. Repeat these steps to connect each battery tray to the UPS-Battery wiring harness.
6. Continue to one of the following sections:
   - See paragraph 4.6 *Extended Battery Module Installation* to install optional EBMs.
   - See Chapter 6 *Communication* to install UPS communication options, such as X-Slot cards or remote emergency power-off (REPO).
   - See Chapter 7 *UPS Operating Instructions* to start up the UPS.

4.6 Extended Battery Module Installation

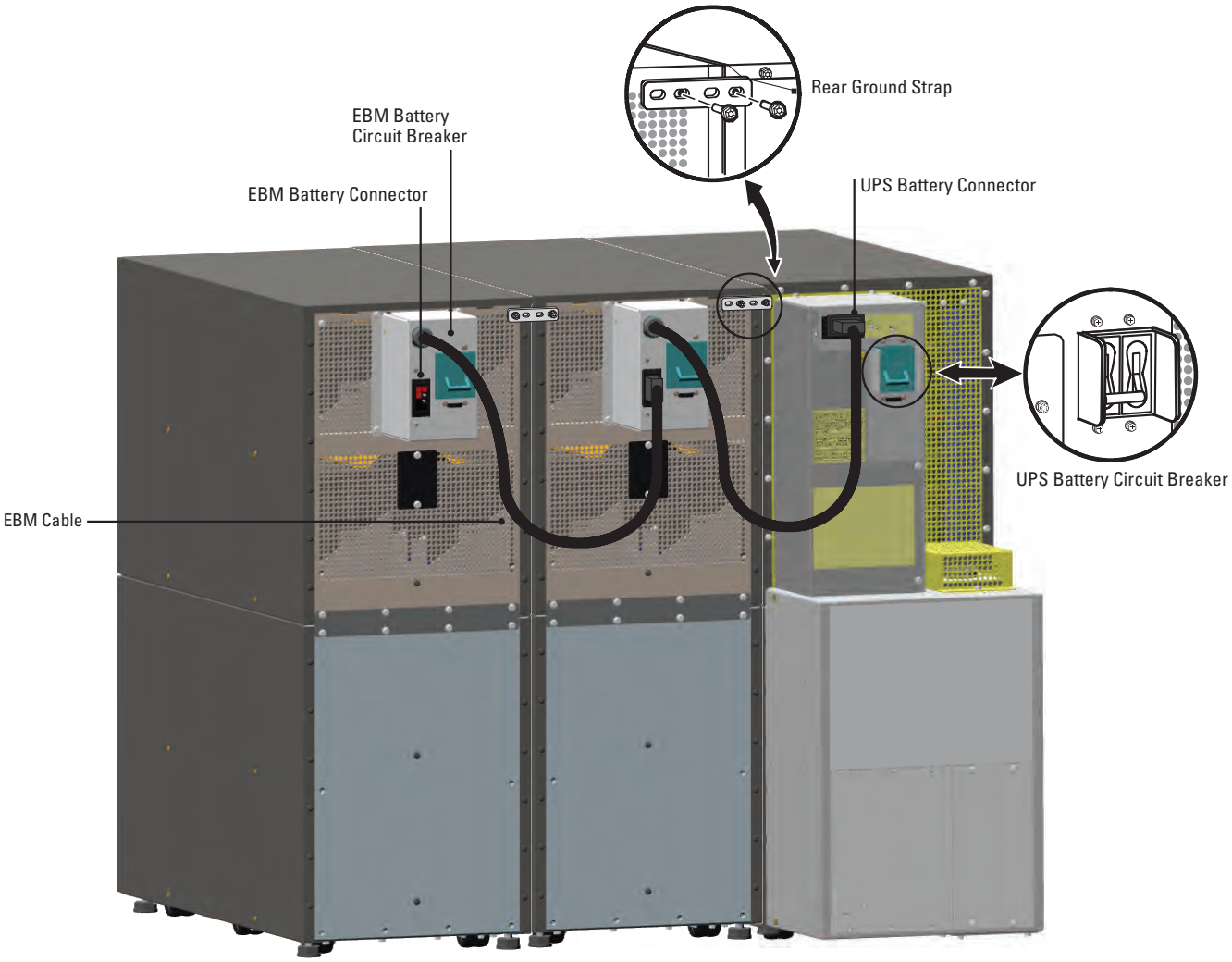
	NOTE	A maximum of 22 battery strings can be installed in one configuration, including UPS batteries (4 EBM-64 models or 3 EBM-96 models). UPS-32 models contain 2 strings; UPS-64 models contain 4 strings; EBM-64 models contain 4 strings; and EBM-96 models contain 6 strings.

	NOTE	For non-seismic installations, you MUST install the stabilizing bracket on all 3-high cabinets. The stabilizing bracket is optional for 2-high cabinets.

To install the optional Extended Battery Module (EBM):

1. Position the EBM adjacent to the next cabinet.
2. Verify that all battery circuit breakers are in the OFF position (see Figure 54).
3. Remove the two ground straps from the EBM rear panel.
4. Install one ground strap between the UPS and EBM rear panels as shown in Figure 54.
5. If additional EBMs are installed, attach another ground strap between the first and second EBM as shown in Figure 54. Repeat for each additional EBM.
6. Plug the EBM cable into the UPS battery connector.
7. If additional EBMs are installed, plug the EBM cable of the second cabinet into the battery connector on the first EBM. Repeat for each additional EBM.

Figure 54. Typical EBM Installation (2-High Cabinets Shown)



8. Remove the top front covers of all cabinets.
9. Install the remaining ground straps between each cabinet (see Figure 55).

10. Reinstall the top front covers removed in Step 8.

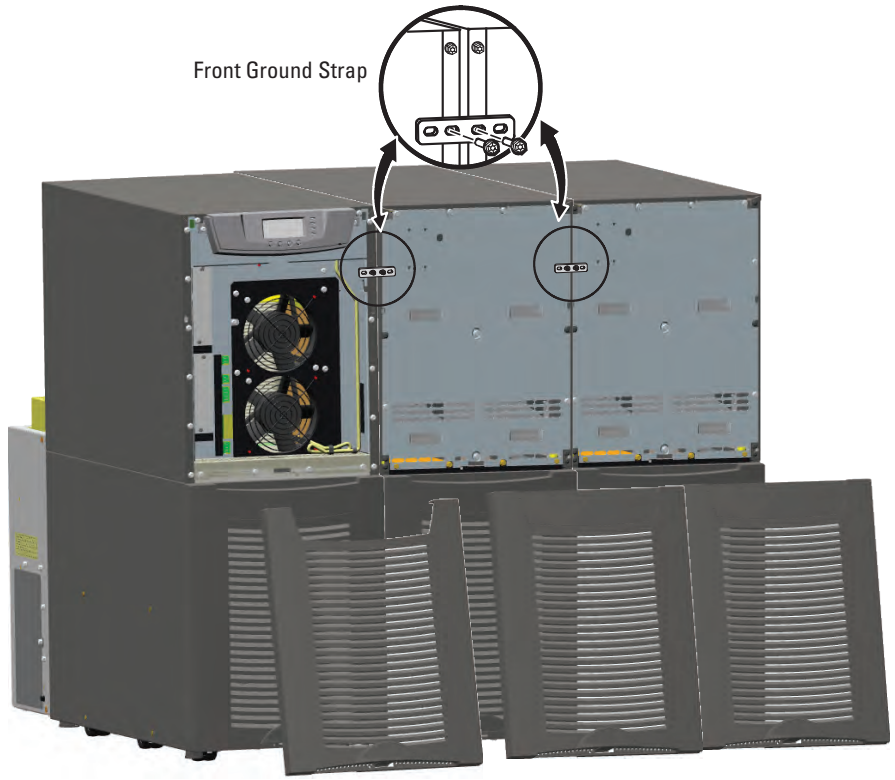
    Hang the top edge of the cover on the cabinet first, then lower the bottom edge and snap into place.

11. Continue to one of the following sections:

    - See Chapter 6 *Communication* to install UPS communication options, such as X-Slot cards or remote emergency power-off.
    - See Chapter 7 *UPS Operating Instructions* to start up the UPS.

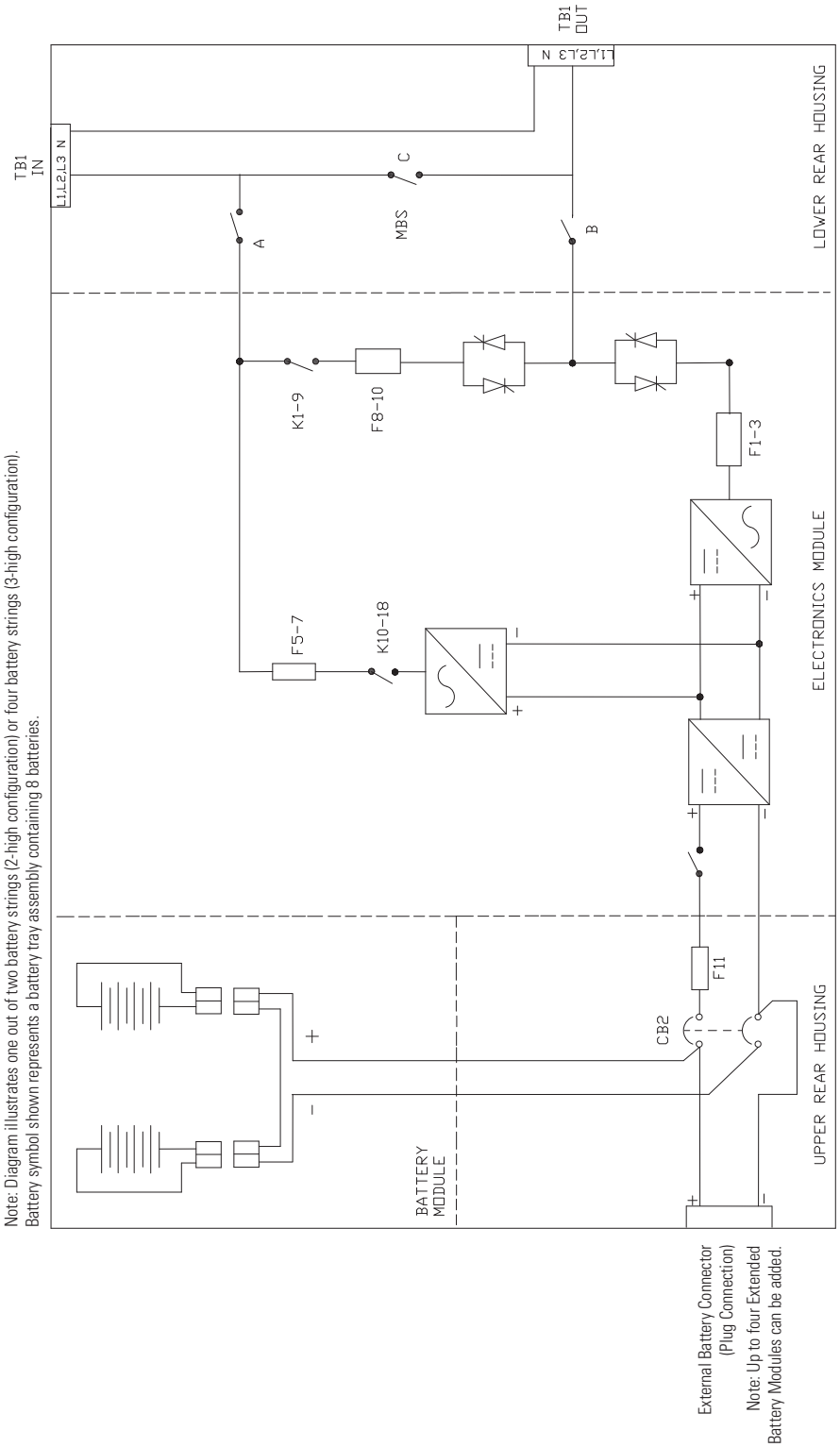
NOTE After UPS startup, ensure maximum battery runtime by configuring the UPS for the correct number of EBMs (see Configuring the UPS for EBMs).

Figure 55. Front Ground Strap Installation (2-High Cabinets Shown)



Chapter 5 UPS Wiring Diagram Schematics

Figure 56. UPS Wiring Diagram

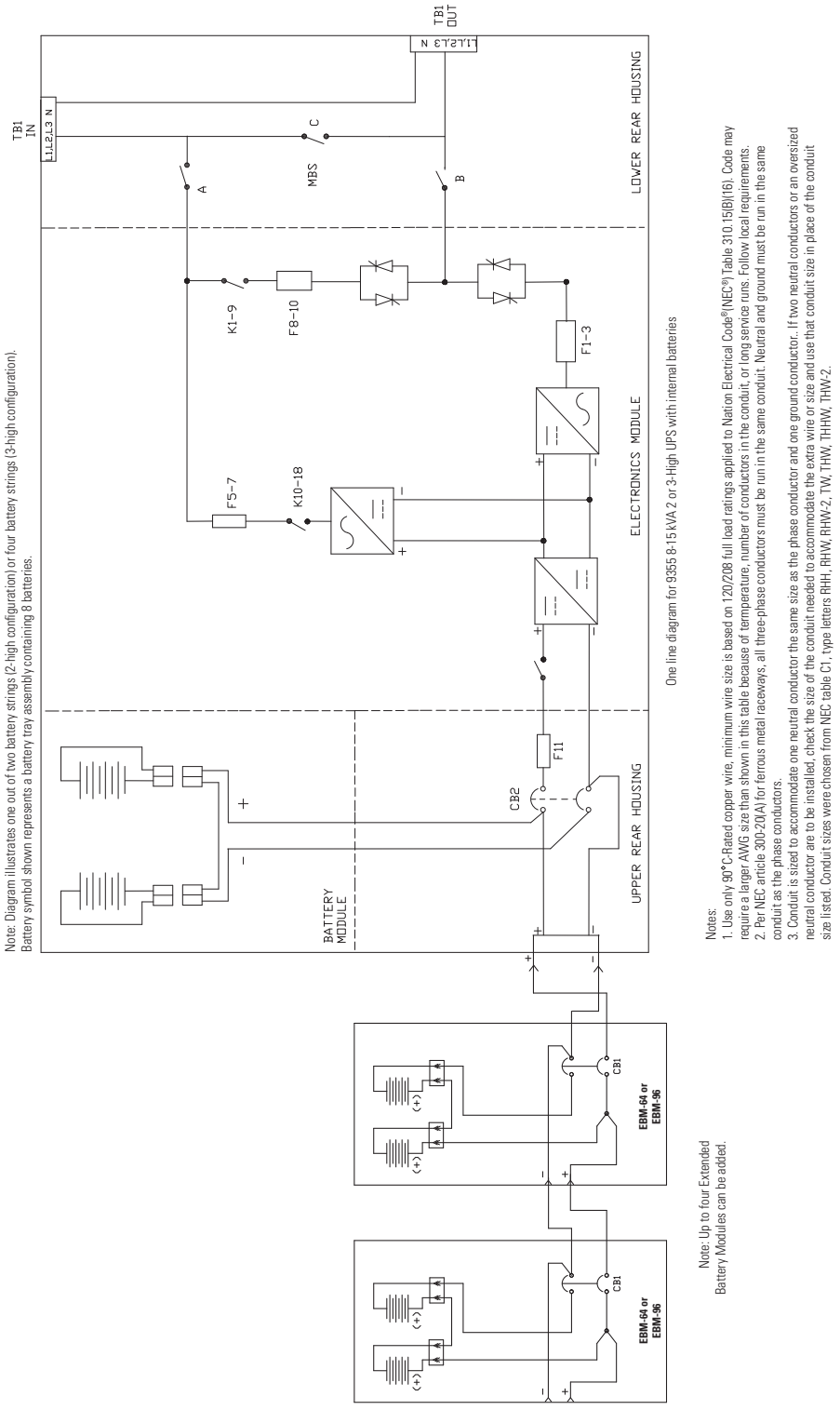


Note: Diagram illustrates one out of two battery strings (2-high configuration) or four battery strings (3-high configuration).
Battery symbol shown represents a battery tray assembly containing 8 batteries.

One line diagram for 9355 8-15 kVA 2 or 3-High UPS with internal batteries

Notes:
1. Use only 90°C-Rated copper wire, minimum wire size is based on 120/208 full load ratings applied to Nation Electrical Code®(NEC®) Table 310.15(B)(16). Code may require a larger AWG size than shown in this table because of termperature, number of conductors in the conduit, or long service runs. Follow local requirements.
2. Per NEC article 300-20(A) for ferrous metal raceways, 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.
3. Conduit is sized to accommodate one neutral conductor the same size as the phase conductor and one ground conductor.. If two neutral conductors or an oversized neutral conductor are to be installed, check the size of the conduit needed to accommodate the extra wire or size and use that conduit size in place of the conduit size listed. Conduit sizes were chosen from NEC table C1, type letters RHH, RHW, RHW-2, TW, THW, THHW, THW-2.

Figure 57. UPS with Extended Battery Modules Wiring Diagram



Note: Diagram illustrates one out of two battery strings (2-high configuration) or four battery strings (3-high configuration).
Battery symbol shown represents a battery tray assembly containing 8 batteries.

One line diagram for 9355 8-15 kVA 2 or 3-High UPS with internal batteries

Notes:
1. Use only 90°C-Rated copper wire, minimum wire size is based on 120/208 full load ratings applied to Nation Electrical Code®(NEC®) Table 310.15(B)(16). Code may require a larger AWG size than shown in this table because of termperature, number of conductors in the conduit, or long service runs. Follow local requirements.
2. Per NEC article 300-20(A) for ferrous metal raceways, 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.
3. Conduit is sized to accommodate one neutral conductor the same size as the phase conductor and one ground conductor.. If two neutral conductors or an oversized neutral conductor are to be installed, check the size of the conduit needed to accommodate the extra wire or size and use that conduit size in place of the conduit size listed. Conduit sizes were chosen from NEC table C1, type letters RHH, RHW, RHW-2, TW, THW, THHW, THW-2.

Note: Up to four Extended Battery Modules can be added.

Figure 58. UPS with Input Isolation Transformer Wiring Diagram

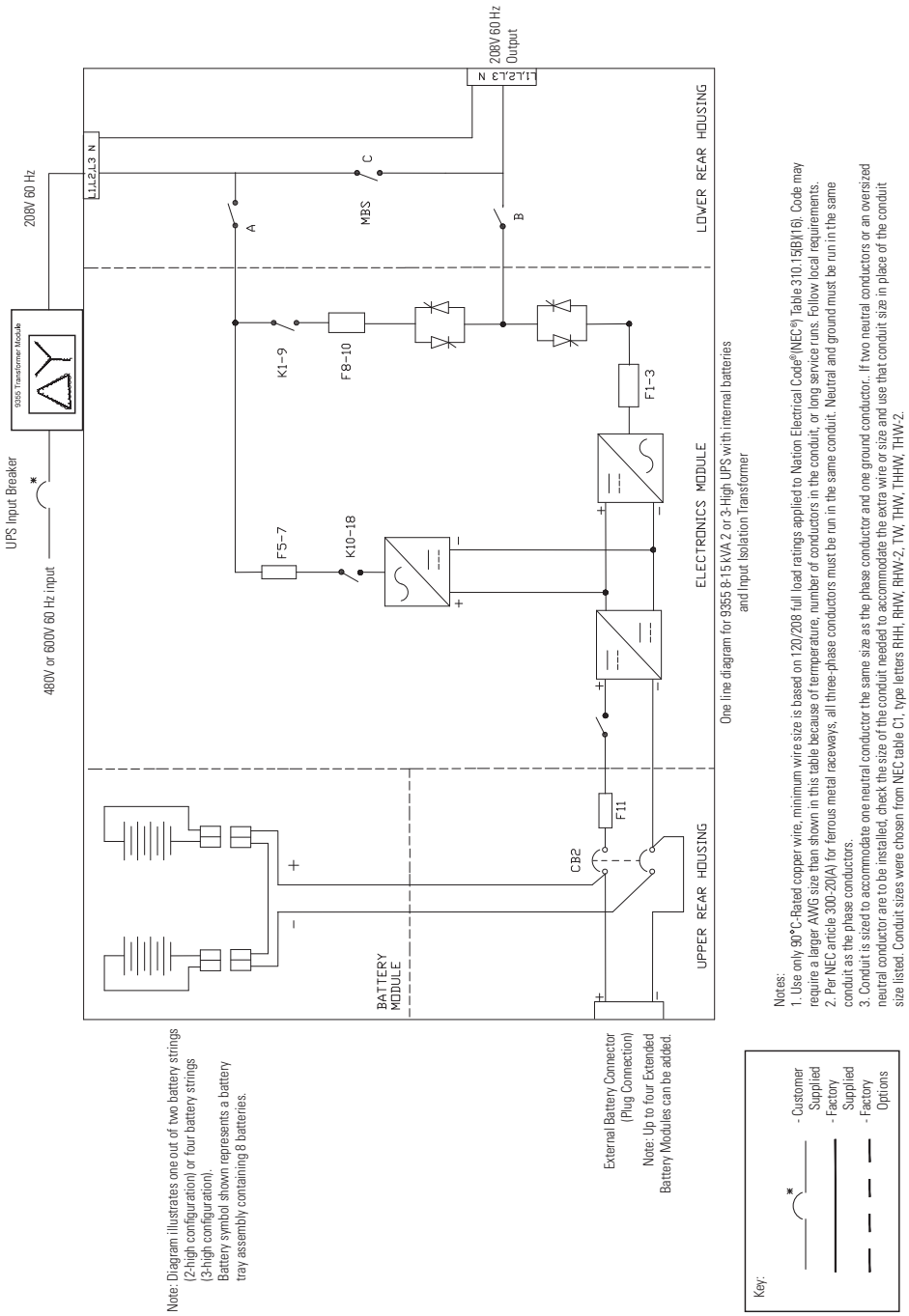


Figure 59. Wall-Mounted Bypass Switch (Version 1) Bypass Wiring Diagram

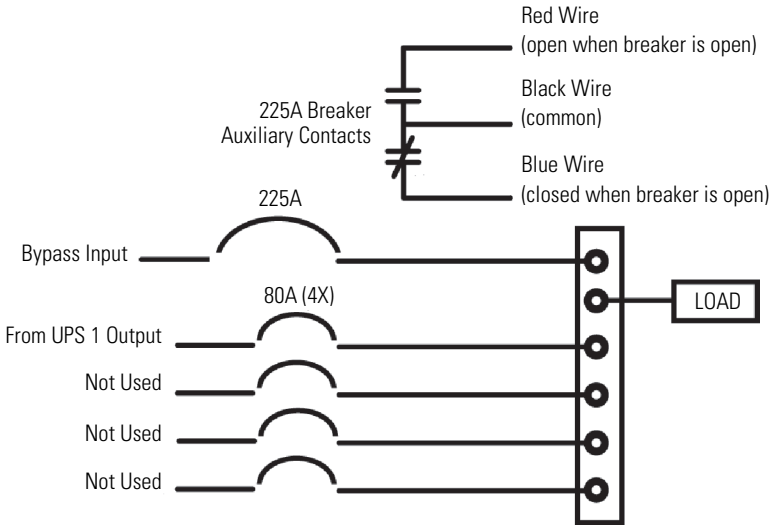


Figure 60. UPS with Input Isolation Transformer and Version 1 Wall-Mounted Bypass Wiring Diagram

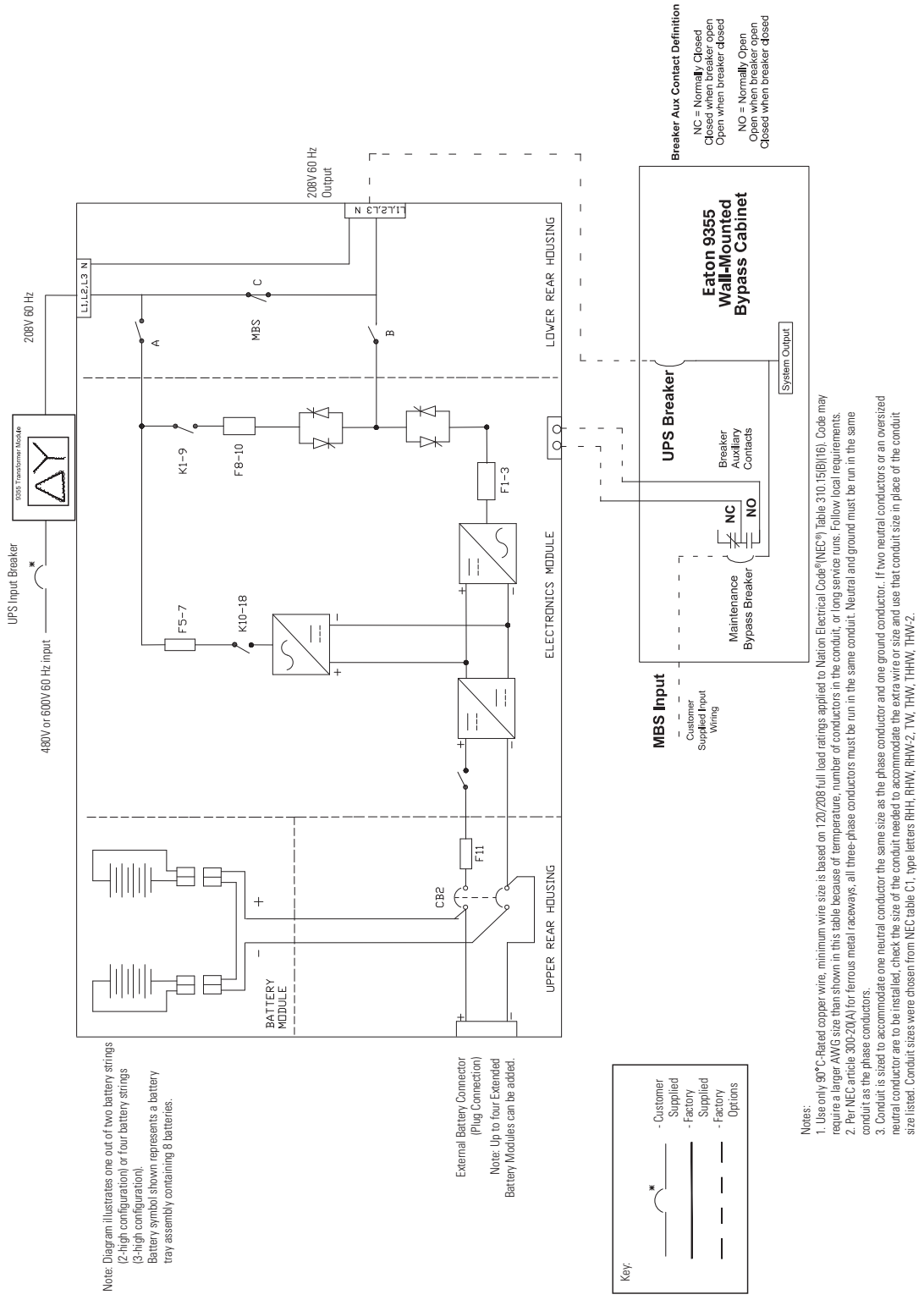


Figure 61. Version 2 Bypass Cabinet Bypass Wiring Diagram – without Maintenance Isolation Switch (MIS)

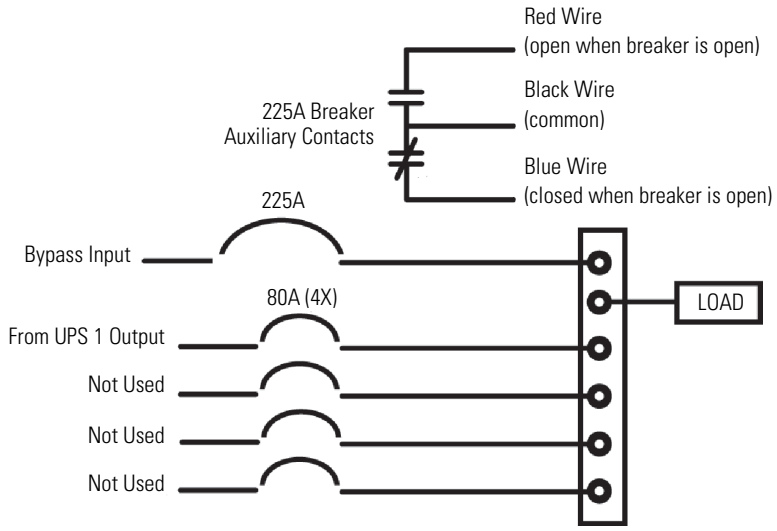


Figure 62. Version 2 Bypass Cabinet Bypass Wiring Diagram – with MIS

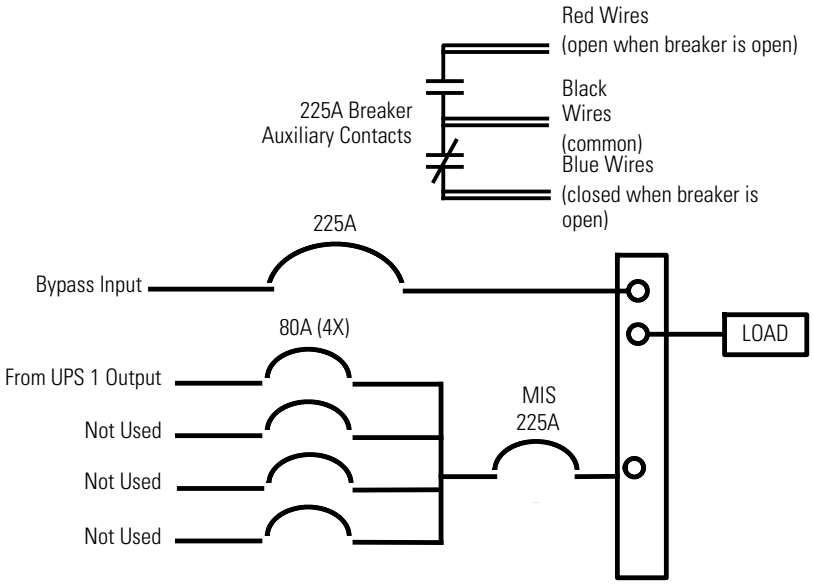
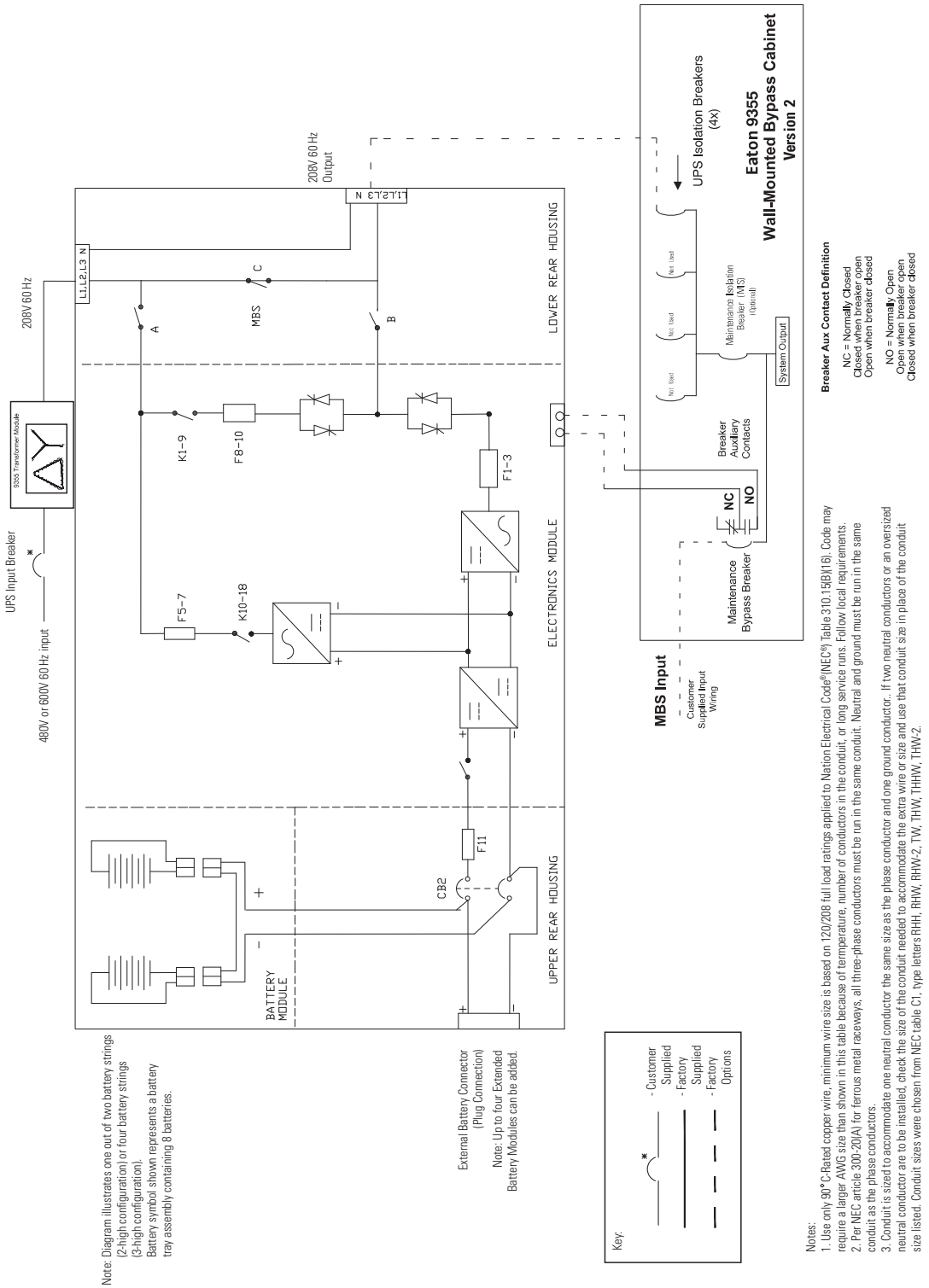


Figure 63. UPS with Input Isolation Transformer and Version 2 Wall Mounted Bypass Cabinet Wiring Diagram



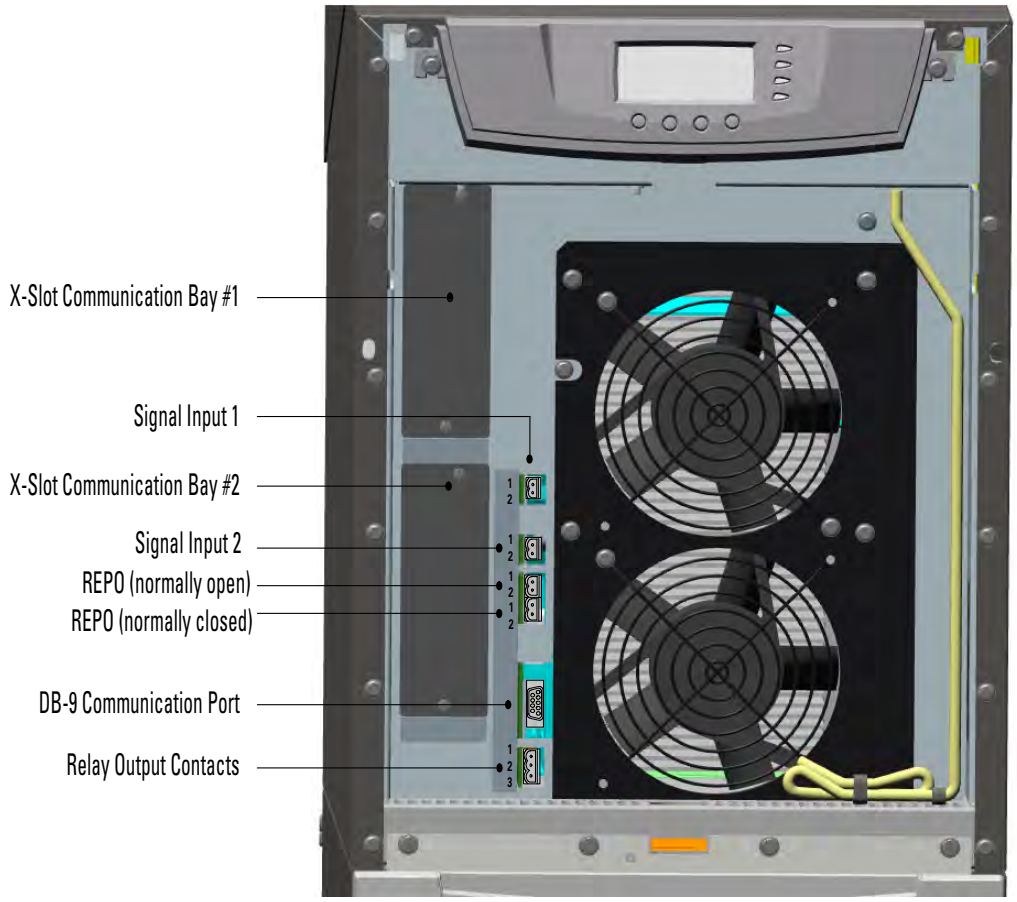
Chapter 6 Communication

This section describes the:

- DB-9 communication port
- X-Slot cards
- Remote Monitor Panel and Industrial Relay Card (IRC)
- Power Management Software
- Remote emergency power-off (REPO)
- Relay output contacts
- Programmable signal inputs

Figure 64 shows the location of the communication options and control terminals on the UPS.

Figure 64. Communication Options and Control Terminals



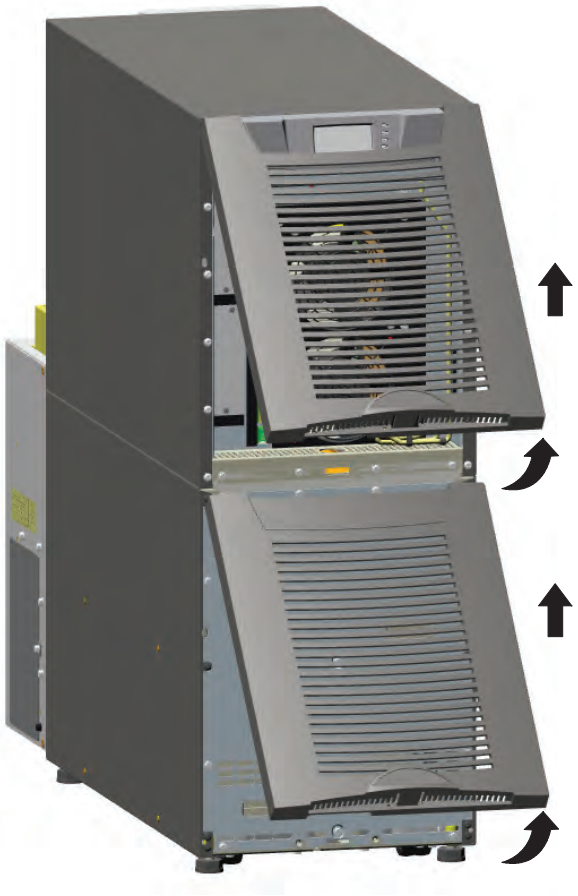
6.1 Installing Communication Options and Control Terminals

To access and install the communication options and control terminals:

1. Remove the front covers of all cabinets, starting with the top cabinet.

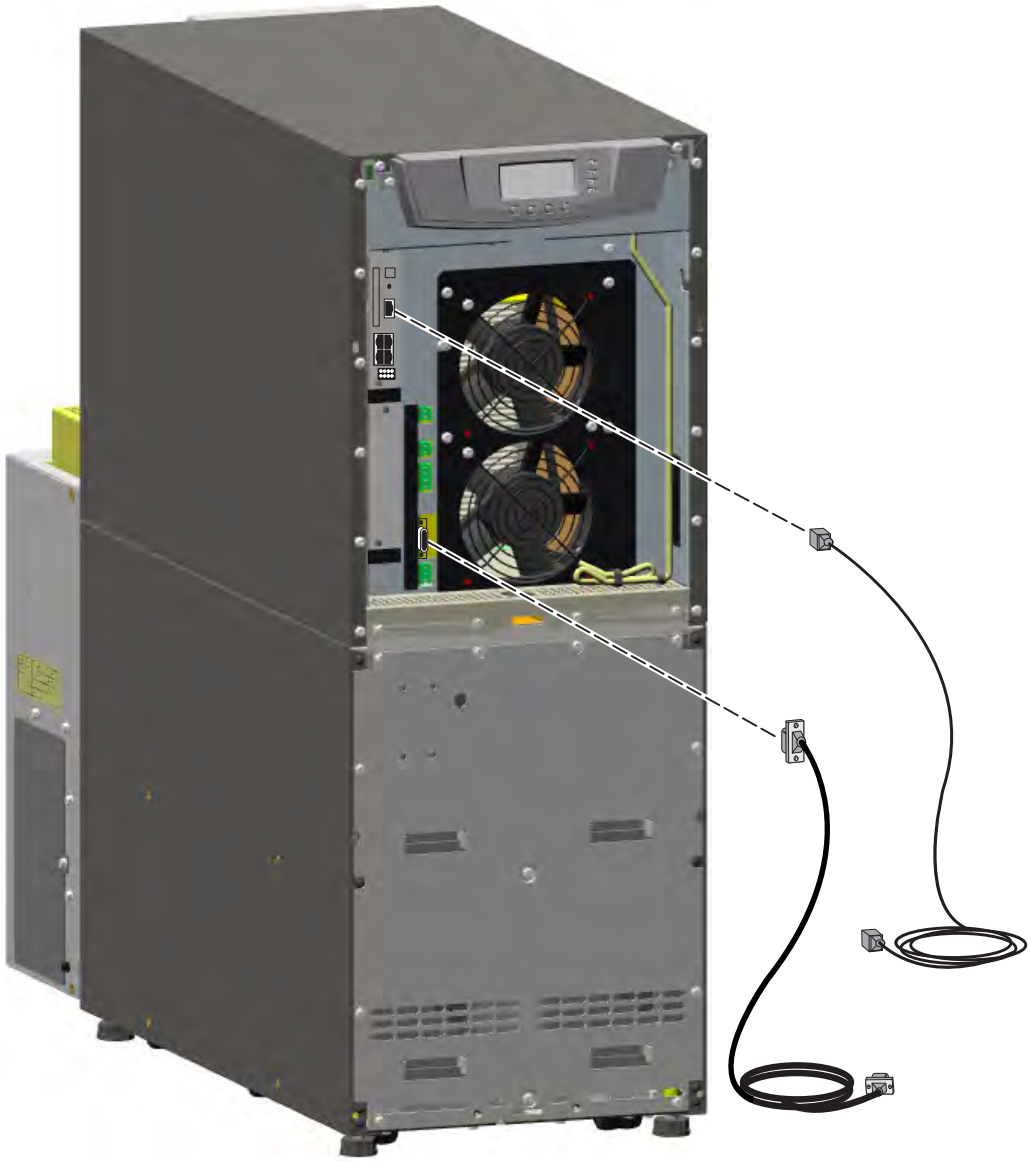
Press and release the handle latch at the bottom of each cover and then lift the cover up and off the cabinet (see Figure 65).

Figure 65. Removing the Front Covers



2. Install the appropriate X-Slot card and/or necessary cable(s) into the top cabinet (see Figure 64 and Figure 66).

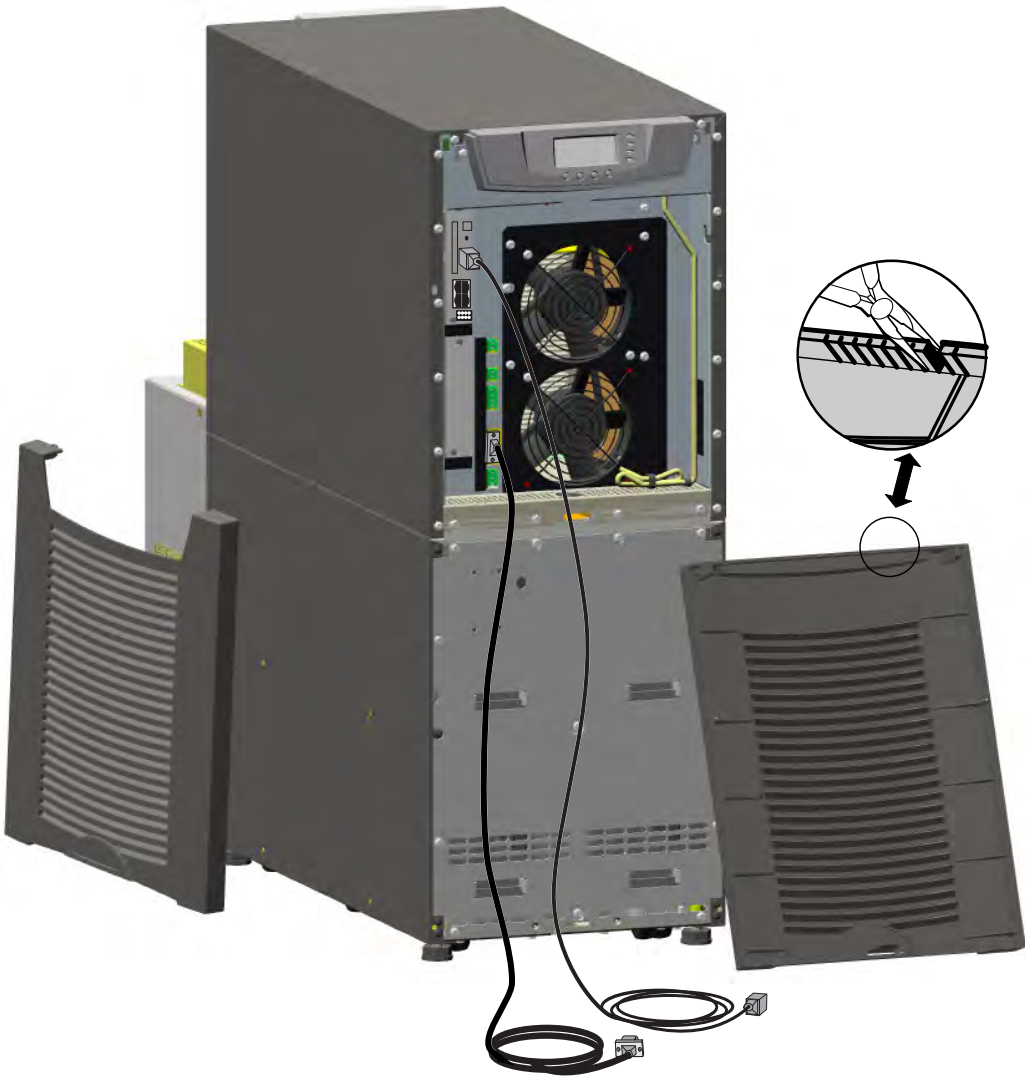
Figure 66. Installing Communication Cables



3. On the bottom cover (and also the middle cover if 3-high), remove a knockout tab in the top edge of the cover for each cable:

   With wire cutters, cut either side of the tab and twist down to remove the tab (see Figure 67).

Figure 67. Removing Knockout Tabs



4. Route the cable(s) to the approximate location of the cover access holes.
5. Connect the cables to the appropriate location.

   See Chapter 6 *Communication* or paragraph 6.3 *Control Terminals* for detailed information.
6. Reinstall the front covers, starting with the bottom cabinet (see Figure 68).

   Hang the top edge of the cover on the cabinet first, then lower the bottom edge and snap into place. Verify that the cables fit in the access holes in the covers.

Figure 68. Reinstalling the Front Covers

7. Proceed to Chapter 7 *UPS Operating Instructions* to start up the UPS.

NOTE After UPS startup, ensure maximum battery runtime by configuring the UPS for the correct number of EBMs (see paragraph 7.6 *Configuring the UPS for EBMs*).

6.2 Communication Options

The Eaton 9355 UPS has serial communication capabilities through the DB-9 communication port or through an X-Slot card in one of the available bays. In addition, the Power Management Software can be installed and used to communicate with the UPS via one of the serial communication connections.

The UPS supports two serial communication devices according to the following table:

Independent	Multiplexed	
X-Slot 1	**X-Slot 2**	**DB-9 Communication Port**
Any X-Slot card	Any X-Slot card except the Eaton Modem Card	Not in use
Any X-Slot card	Eaton Relay Interface Card Powerware Hot Sync CAN Bridge Card	Available
Any X-Slot card	Not in use	Available

NOTE You can configure relays, signal inputs, and the serial port baud rate through the front panel menus (see 7.1.3 *User Settings*).

6.2.1 DB-9 Communication Port

To establish communication between the UPS and a computer, connect your computer to the UPS communication port using the supplied communication cable.

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 69 and the pin functions are described in Table 7. See Figure 64 for the communication port location.

Figure 69. Communication Port

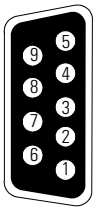


Table 7. Communication Port Pin Assignment

Pin Number	Signal Name	Function	Direction from the UPS
2	TxD	Transmit to external device	Out
3	RxD	Receive from external device	In
5	GND	Signal common (tied to chassis)	—

6.2.2 X-Slot Cards

X-Slot cards allow the UPS to communicate in a variety of networking environments and with different types of devices. The Eaton 9355 UPS has two available communication bays for any X-Slot card, including:

- Gigabit Industrial Gateway Card - provides a data gateway from the UPS to Visual Power Manager; provides remote monitoring through a Web browser interface, e-mail, and a network management system using SNMP; connects to a twisted-pair Ethernet (10/100/1000 BaseT) network. Modbus TCP support provides direct integration of the UPS's parameters to a Building Management System (BMS).

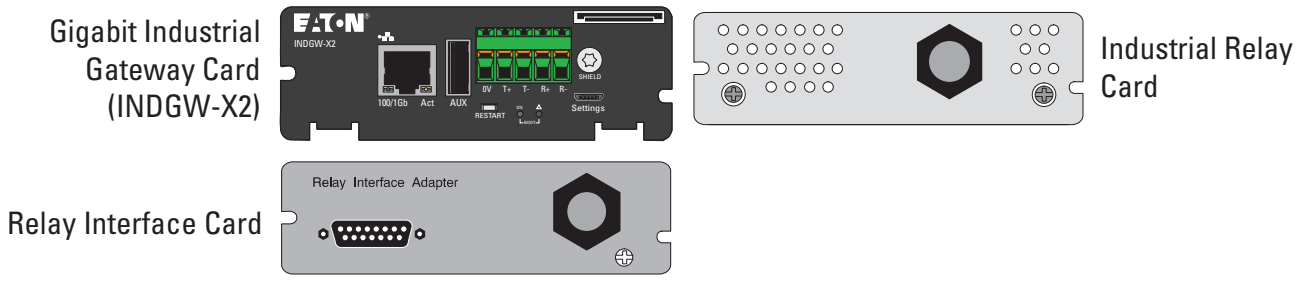
NOTE BACnet IP and BACnet BBMD (BACnet Broadcast Management Device) protocols are also supported.

- Relay Interface Card - has isolated dry contact (Form-C) relay outputs for UPS status: Utility failure, Low battery, UPS alarm/OK, or On bypass.
- Industrial Relay Card - is used to indicate the operating status of the UPS using the customer's monitoring equipment and to connect an optional RMP. The IRC uses four isolated normally-open or normally-closed dry relay contacts to indicate the UPS status. Normal, Bypass, Battery, and Alarm mode can be monitored.

NOTE The Eaton 9355 UPS does not detect plug-and-play hardware. .

See Figure 64 for the location of the two X-Slot communication bays.

Figure 70. Optional X-Slot Cards



6.2.3 Remote Monitor Panel

The optional RMP can be installed to monitor the operation of the UPS from virtually any location within your facility, up to 152.4m (500 ft) from the UPS. You can surface–mount an RMP on a desktop or on a wall, wherever you have a serial interface line. Figure 71 shows an RMP. Figure 72 shows the enclosure dimensions and cable exit openings.

Figure 71. Remote Monitor Panel

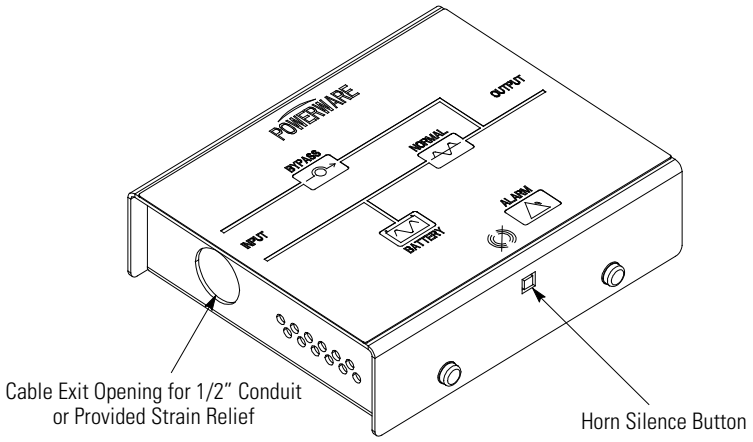
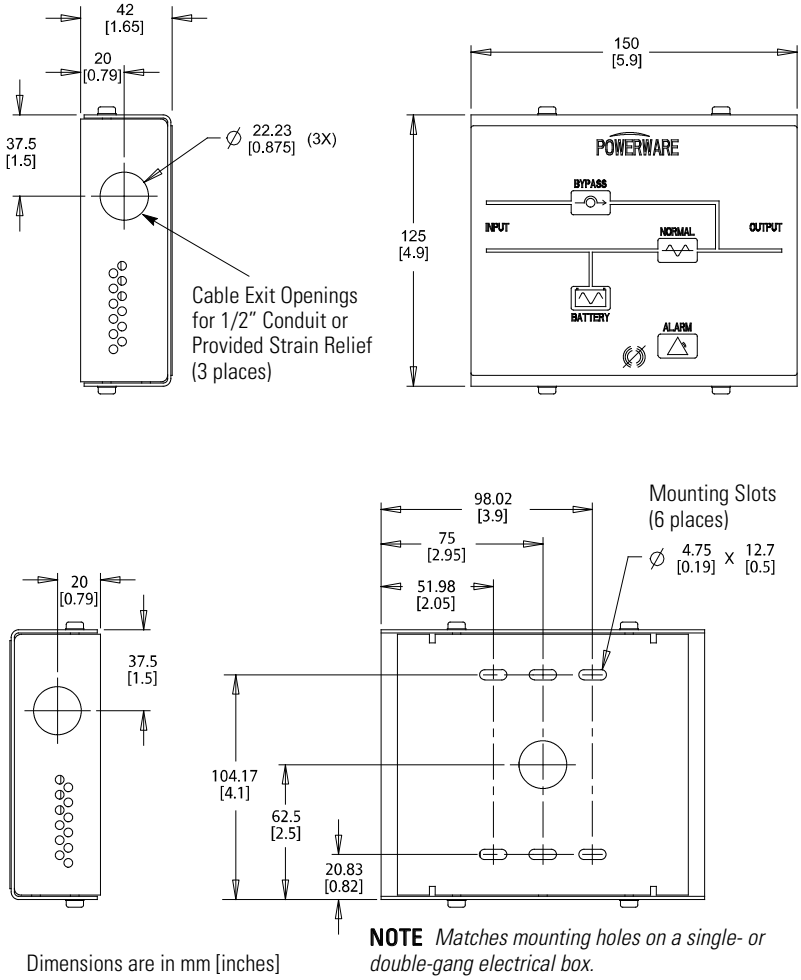


Figure 72. RMP Dimensions



NOTE *Matches mounting holes on a single- or double-gang electrical box.*

To install an RMP:

NOTE If mounting to a hollow wall, secure the enclosure bottom to a wood or metal stud within the wall. Do not use hollow wall anchors. The RMP can also be mounted to a single- or double-gang electrical box.

1. If wall mounting, securely mount the RMP. Proceed to Step 2.

   If desk mounting, install the provided bumpers to the bottom of the RMP enclosure. Proceed to Step 3.

2. Install 1/2" conduit from the RMP to the IRC through the cable exit openings (see Figure 72). Proceed to Step 4.

3. Install wiring from the RMP to the IRC using the cable listed in Table 8 and the provided strain relief bushings in the cable exit openings in the IRC (see Figure 74) and the RMP.

4. Connect the wiring between the RMP and the IRC plug–in terminal blocks using terminations shown in Table 8. See Figure 73 and Figure 74 for plug–in terminal block locations.

Table 8. RMP Wire Terminations

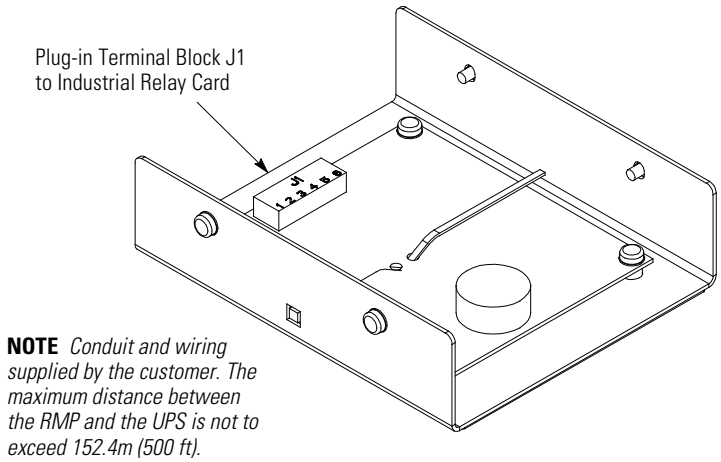
From RMP Terminal	To IRC Terminal	Remarks
J1-1	J1-1	Use Beldon 8690 060 or equivalent cable
J1-3	J1-3	
J1-4	J1-4	
J1-5	J1-5	
J1-6	J1-6	

5. Install the IRC into an open X-Slot communication bay (see Figure 66).

6. To check the operation of the RMP, ensure that the UPS is supplying the load via the inverter or bypass. If the indicators on the RMP show the appropriate status, then it is operating correctly.

   If the RMP is not operating correctly, check the wiring, the fuse on the IRC, and the plug–in terminal blocks for proper seating. If all connections are secure but the RMP still does not operate correctly, replace the fuse. If this does not correct the problem, contact your service representative for verification that the RMP is working correctly.

Figure 73. RMP Top Internal View

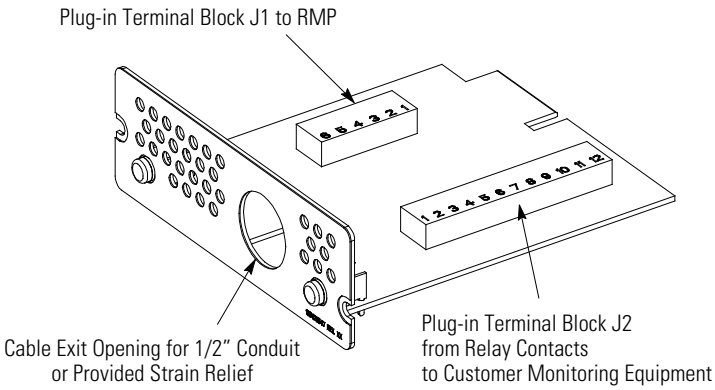


NOTE *Conduit and wiring supplied by the customer. The maximum distance between the RMP and the UPS is not to exceed 152.4m (500 ft).*

6.2.4 Industrial Relay Card

The IRC uses normally-open or normally-closed dry relay contacts to indicate the UPS status as listed in Table 9. Figure 74 shows an IRC.

Figure 74. Industrial Relay Card



1. Verify that the UPS is turned off and all power sources are removed.
2. Install wiring from the IRC to the monitoring equipment using 1/2" conduit through the cable exit opening in the IRC (see Figure 75).
3. Connect wiring between the IRC and the monitoring equipment using terminations shown in Table 9. See Figure 74 for plug–in terminal block locations.
4. Install the IRC into an open X-Slot communication bay (see Figure 66).
5. To check the operation of the IRC, ensure that the UPS is supplying the load via the inverter or bypass. If the indicators on the customer's monitoring equipment show the appropriate status, then it is operating correctly.

   If the IRC is not operating correctly, check the wiring, the fuse on the IRC, and the plug–in terminal blocks for proper seating. If all connections are secure but the IRC still does not operate correctly, replace the fuse. If this does not correct the problem, contact your service representative for verification that the IRC is working correctly.

Table 9. IRC Wire Terminations

IRC Terminal	Function	Remarks
J2-1	NC	Normal mode
J2-2	COM	
J2-3	NO	
J2-4	NC	Bypass mode
J2-5	COM	
J2-6	NO	
J2-7	NC	Battery mode
J2-8	COM	
J2-9	NO	

Table 9. IRC Wire Terminations (Continued)

IRC Terminal	Function	Remarks
J2-10	NC	Alarm mode
J2-11	COM	
J2-12	NO	
Maximum contact rating: 250 Vac, 30 Vdc @ 5A; Wire range: 16 24 AWG		

6.2.5 Power Management Software

Power management software is available via the Eaton website, www.Eaton.com/downloads.

Each Eaton 9355 UPS ships with an interface cable which is used for communication between the UPS and your computer.

NOTE Use only the supplied communication cable to connect the UPS to your computer.

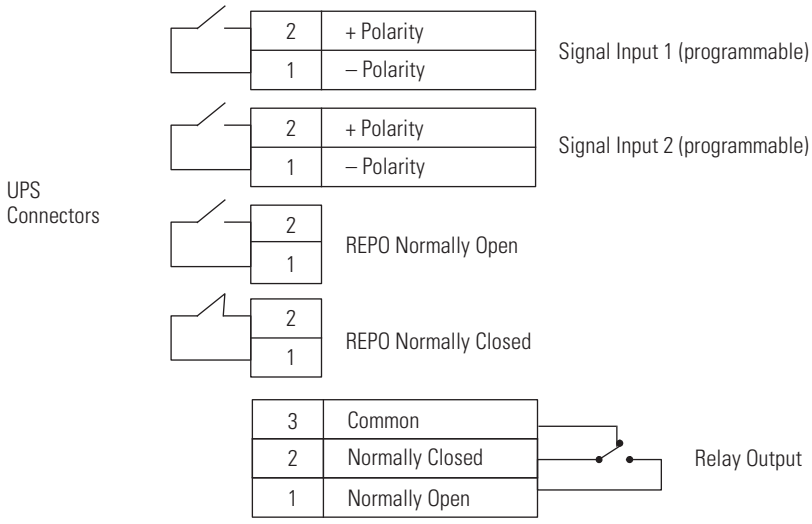
Power management software provides up-to-date graphics of UPS power and system data and power flow. It also gives you a complete record of critical power events, and it notifies you of important UPS or power information. If there is a power outage and the Eaton 9355 UPS battery power becomes low, power management software can automatically shut down your computer system to protect your data before the UPS shutdown occurs.

Navigate to the Eaton website, www.Eaton.com/downloads for installation instructions and to download the power management software.

6.3 Control Terminals

The cables should be connected to the control terminals with a mating connector. Input and output terminals have a functional isolation from terminal to terminal. They are connected to the UPS chassis through individual 1 MW resistors.

Figure 75. External Control Terminal Connections



NOTE If using a semiconductor switch type, pay attention to the proper polarity. A relay or other mechanical control is preferred.

6.3.1 Remote Emergency Power-off

REPO is used to shut down the UPS from a distance. 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, trips the battery circuit breaker, and fully powers down within 10-15 seconds.

There are two REPO positions that may be used, normally-open or normally-closed.

The pins on the normally-closed REPO connector are connected together. When this connection is open, the logic circuitry completely shuts down the UPS, thus preventing the power from supplying the load.

If the use of normally-closed REPO operation is desired, replace the connector with a normally-closed external switch (see Figure 64).

If the use of normally-open REPO operation is desired, connect a normally-open external switch (see Figure 64).

NOTE 1 To restart the UPS, reconnect the REPO connector pins and turn on the UPS manually. The pins must be shorted to keep the UPS running. Maximum resistance is 10 ohm

NOTE 2 Leave the REPO connector installed in the REPO port on the UPS rear panel even if the REPO function is not needed.

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.

REPO Connections			
Wire Function		Terminal Wire Size Rating	Suggested Wire Size
REPO	L1 L2	12 22 AWG(4 0.32 mm^2)	18 AWG (0.82 mm^2

6.3.2 Relay Output Contacts

The UPS incorporates a programmable relay output with potential free contacts for remote alarm indications (see Figure 64). An additional four relay outputs can be obtained with the X-Slot compatible Relay Interface Card.

WARNING

The relay output contacts must not be connected to any utility connected circuits. Reinforced insulation to the utility is required. The relay output contacts must have a maximum rating of 30 Vac/1A and 60 Vdc/2A nominal values.

6.3.3 Programmable Signal Inputs

The UPS incorporates two programmable signal inputs (see Figure 64 on Figure 64). Use of non-polar (relay) control input is recommended. The pins must be shorted with maximum resistance of 10 ohm in order to activate the specific input.

NOTE See Figure 57 for the polarity and verify these connections if polarity control is required.

The default and programmable settings for the signal inputs are shown in Table 10.

Table 10. Programmable Signal Inputs

Signal	Description
Disable Bypass Operation	If active, the automatic transfer to the static bypass is prevented.
Charger Off	If active, the battery charge function is disabled. In a utility power outage, the discharge of batteries is supported.
Remote ON/OFF	If active, the UPS output turns off regardless of the mode of operation. Auxiliary power, fan, communication, and rectifier/battery charger remain functional. Restart is initiated immediately when this signal is inactive.
Request Bypass	If active, the UPS transfers to bypass if the bypass voltage, frequency, and synchronization are all okay.

Table 10. Programmable Signal Inputs (Continued)

Signal	Description
Request Normal	If active, the UPS transfers to inverter operation if not prohibited by REPO or an alarm condition.
Force Bypass	If active, the UPS is forced to static bypass operation regardless of the bypass status.
External Battery Breaker Status	If active, the UPS knows that the batteries are disconnected.
Building Alarm 1-6	These alarms can be activated separately or at the same time with other building alarms.
Not in Use	Default
Shutdown	If active, the UPS shuts down immediately.
Delayed Shutdown	If active, the UPS shuts down after a user-configured delay time. Default shutdown delay is 120 seconds. The UPS automatically restarts when the signal changes to inactive.
Normal/Bypass	If active, the UPS transfers to bypass if okay. If inactive, the UPS transfers to the inverter when possible.
On Generator	If active, the UPS knows that input is fed from the generator. Bypass is disabled; the automatic battery test is disabled.
External Transformer Overtemperature	This option is not used.

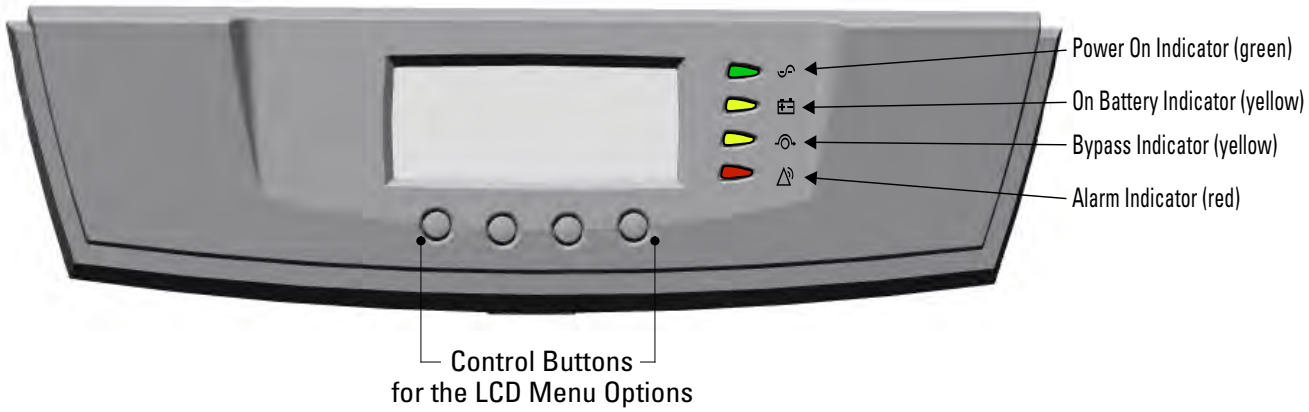
Chapter 7 UPS Operating Instructions

This chapter contains information on how to use the Eaton 9355 UPS, including front panel operation, UPS startup and shutdown, and configuring the UPS for Extended Battery Modules (EBMs).

7.1 Control Panel Functions

The UPS has a four-button graphical LCD with backlight. It provides useful information about the UPS itself, load status, events, measurements, and settings (see Figure 76).

Figure 76. Eaton 9355 UPS Control Panel



The following table shows the indicator status and description.

Indicator	Status	Description
Green	On	The UPS is operating normally.
	Flashing	A new information message is active.
	Off	The UPS is turned off and will not turn on automatically.
Yellow	On	The UPS is in Battery mode.
Yellow	On	The UPS is in Bypass mode.
Red	On	The UPS has an active alarm.
	Flashing	There is a new UPS alarm condition. See Chapter 9 *Troubleshooting* for additional information.

7.1.1 Changing the Language

Press and hold the first button on the left for approximately five seconds to select the language menu. This action is possible from any LCD menu screen.

7.1.2 Display Functions

As the default or after 15 minutes of inactivity, the LCD displays the selectable startup screen. The default is the Eaton logo and can be changed to the Mimic screen in the User Settings menu.

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

Use the two middle buttons (↑ and ↓) to scroll through the menu structure. Press the button to enter a submenu. Press the ↵ button to select an option. Press the ESC button to cancel or return to the previous menu.

The following table shows the basic menu structure.

Table 11. Menu Map for Display Functions

Main Menu	Submenu	Display Information or Menu Function
UPS Status		UPS off / System normal / UPS supporting load / UPS on battery / UPS on bypass / Active alarm list / Battery status
Event Log		Displays up to 127 events and alarms
Measurements	Output	L-N and L-L / Current / Frequency / Power
	Battery	Voltage / Current / Runtime
	Input	L-N and L-L / Current / Frequency
	Bypass	L-N and L-L / Frequency
Control	Go to Bypass Mode	Transfers the UPS to internal Bypass mode When this command is active, the option changes to Go to Normal Mode.
	Start Battery Test	Initiates a battery test
	Display Test	Four different selectable tests for the front panel functions: the LEDs cycle through, the alarm beep sounds, the backlight turns off and on, and the pixels scroll through to test the LCD.
Settings	User Settings	See Table 12 for more information.
	Service Settings	This screen is password-protected.
Identification		UPS Type / Part Number / Serial Number / Firmware / Display / CAN Bridge
Turn UPS ON/OFF	ON and OFF Options	

7.1.3 User Settings

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

NOTE Changes to the output voltage or frequency options should be made before turning on the UPS; otherwise, the changes do not take effect.

Table 12. User Settings

Description	Available Settings	Default Setting
Set Date and Time	Set Month Date: mm/dd/yyyy Time: 24:00	01/01/2003 00:00
Display Contrast	Adjust contrast with up/down arrow buttons	Moderate
Change Language	Select Language: <English> Elegir idioma <Español>	English
Relay Config	Relay: [Alarm 1] [X-Slot 1-1/2/3/4] or [X-Slot 2-1/2/3/4] Setup: [Battery Low] [On Battery] [On Bypass] [UPS ok] [custom] [empty]	Alarm 1: empty X-Slots (1 or 2) #1: UPS ok #2: On Bypass #3: Summary Alarm #4: On Battery
Signal Inputs	[empty] [Logic] (see paragraph 6.3.3 *Programmable Signal Inputs* for more information.)	<empty>
Serial Port Config	Port: [X-Slot-1] [X-Slot-2/Serv] Speed: [19200] [9600] [2400] [1200]	19200
Modem Config	Modem Installation	<Not Installed>
	Set Modem Call Events	Event #0 Call modem: no
	Set Modem Init String	ATZ0
	Set Modem Call Command	None
	Set Modem Communication Password	None
Start Screen	Eaton logo Mimic screen	Eaton logo
User Password	Enabled/Disabled If Enabled is selected, the password is USER.	Disabled
Audible Alarms	Normal Sound/Disabled	Normal Sound
Battery Charging	ABM cycling/constant	ABM cycling
Automatic Battery Tests	Enabled/Disabled Enabled automatically runs the battery test once a month.	Enabled
Full Power Battery Test	Enabled/Disabled	Enabled
Number of Battery Strings	0 through 22 (see paragraph 7.6 *Configuring the UPS for EBMs* for more information.)	2 strings for UPS-32 models 4 strings for UPS-64 models

Table 12. User Settings (Continued)

Description	Available Settings	Default Setting
Battery Capacity	1 through 65535 watts per cell	34 W/cell
Battery Low Alarm Level	1.750 through 1.950 volts per cell	1.880 V/cell
Set Nominal Output Voltage	Output: [120V/208V] [127V/220V]	120V/208V
Bypass Voltage High Limit	+1 through +20% (1% increments)	120V +10%
Bypass Voltage Low Limit	-1 through -20% (1% increments)	120V -15%
Nominal Output Frequency	50 Hz or 60 Hz	60 Hz
Synchronization	Enabled/Disabled	Enabled
Synchronization Window	±0.5 through ±3.0 Hz (0.1 Hz increments)	±2.0 Hz
Unsynchronized Transfer to Bypass	Allowed/Not Allowed	Not Allowed
Output Frequency Slew Rate	0.1 though 5 hertz per second (0.1 Hz increments)	0.5 Hz/s
Usage of Bypass	Enabled/Disabled	Enabled
Transfer to Bypass When Overload	After a delay/Immediately	After a delay
Automatic Start Delay	-1 through 32767 seconds (-1 means disabled)	0s
Control Commands from X-Slot1	Allowed/Disabled	Allowed
Control Commands from X-Slot2/ Serv	Allowed/Disabled	Allowed
X-Slot Signal Input Activation Delay	0 through 65 seconds	5s
Input signal delayed shutdown delay	1 through 65535 seconds	120s
Site Wiring Fault Notice	Enabled/Disabled	Enabled
Reset Custom Event Settings	0 through 32	Total: 0/32
Auto Output Configuration	Enabled/Disabled	Enabled for initial startup Disabled after initial startup

7.2 Initial UPS Startup

Startup and operational checks must be performed by an authorized Eaton Customer Service Engineer, or the warranty terms specified on the product's resources page become void. See Chapter 11 *Warranty* for details. This service is offered as part of the sales contract for the UPS. Contact an Eaton service representative in advance (a minimum two-week notice is required) to reserve a preferred startup date.

⚠WARNING

Only qualified service personnel (such as a licensed electrician) should perform the UPS installation. Initial startup must be performed by an authorized Eaton Customer Service Engineer. Risk of electrical shock.

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

Select one of the following startup options:

Startup Option	Section
Normal mode	See paragraph 7.2.1 *Normal Mode Startup*.
Battery mode	See paragraph 7.2.2 *Starting the UPS on Battery*.
Bypass mode	See paragraph 7.2.3 *Internal Bypass Startup*.
UPS maintenance bypass	See paragraph 7.2.4 *UPS Maintenance Bypass Startup*.
Wall-mounted maintenance bypass	See paragraph 7.2.5 *Wall-Mounted Maintenance Bypass Startup*.
Parallel UPS configuration	Refer to the *Eaton 9355 Parallel UPS (10/15 kVA) User's Guide*.

7.2.1 Normal Mode Startup

To start up the UPS when the load is de-energized:

1. If an optional wall-mounted bypass cabinet is installed, proceed to Step 2; otherwise, proceed to Step 4.
2. Verify the wall mounted bypass is transferred to UPS mode (see paragraph 7.5 *Operating the Wall-Mounted Bypass Cabinet*).
3. Proceed to Step 4.
4. Verify that the internal maintenance bypass switch is in the UPS position (see Figure 77).
5. If an optional isolation transformer is installed, switch the input circuit breaker to the ON position (see Figure 28).
6. Switch ON the utility power where the UPS is connected.
7. Wait for the front panel LCD to illuminate.

   The indicator flashes.
8. Remove the breaker tie from all battery circuit breakers.
9. Switch all battery circuit breakers to the ON position.

   The indicator stops flashing.
10. Press any button on the front panel display to activate the menu options.
11. Press the ↑ button on the front panel display and then press the → button to select the TURN UPS ON/OFF menu.
12. Select the TURN UPS ON option. Press and hold the button for three seconds, until the UPS stops beeping.

    The indicator illuminates. The UPS is now powering the load.

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.

7.2.2 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 when the load is de-energized:

1. If an optional wall-mounted bypass cabinet is installed, proceed to Step 2; otherwise, proceed to Step 4.
2. Verify the wall mounted bypass is transferred to UPS mode (see paragraph *7.5 Operating the Wall-Mounted Bypass Cabinet*).
3. Proceed to Step 4.
4. Verify that the internal maintenance bypass switch is in the UPS position (see Figure 77).
5. Switch all battery circuit breakers to the ON position.

NOTE Leave the battery circuit breaker(s) in the ON position during this operation. If you need to cancel this operation, wait until the front panel LCD illuminates before switching the battery circuit breaker(s) off.

6. Wait for the front panel LCD to illuminate.
7. Press any button on the front panel display to activate the menu options.
8. Within three minutes, press the ↑ button on the front panel display and then press the → button to select the TURN UPS ON/OFF menu.
9. Select the TURN UPS ON option. Press and hold the ↵ button for three seconds, until the UPS stops beeping.

   The UPS starts in Battery mode within two minutes and supplies battery power to your equipment.

7.2.3 Internal Bypass Startup

To start the UPS when load is powered by internal bypass:

1. If an optional wall-mounted bypass cabinet is installed, proceed to Step 2; otherwise, proceed to Step 4.
2. Verify the wall mounted bypass is transferred to UPS mode (see paragraph *7.5 Operating the Wall-Mounted Bypass Cabinet*).
3. Proceed to Step 4.
4. Verify that the internal maintenance bypass switch is in the UPS position (see Figure 77).
5. If an optional isolation transformer is installed, switch the input circuit breaker to the ON position (see Figure 28).
6. Switch ON the utility power where the UPS is connected.
7. Wait for the front panel LCD to illuminate.

   The ⚠ indicator flashes.

   The UPS starts and transfers to Bypass mode. This may take up to 1 minute.

   The ∽ indicator flashes while transferring to bypass then goes out with the ⊙ illuminating to indicate the UPS is operating in Bypass mode. The load is now powered by utility power.

The display indicates On Manual/Maintenance Bypass.

8. To switch to Normal mode from internal Bypass mode, transfer the wall mounted bypass to Bypass mode (see paragraph 7.5 *Operating the Wall-Mounted Bypass Cabinet*) and rotate the internal maintenance bypass switch to the UPS position.

   The indicator illuminates to indicate the UPS is operating in UPS mode. The load is now powered by UPS.

7.2.4 UPS Maintenance Bypass Startup

To start the UPS in maintenance bypass:

1. Verify that the maintenance bypass switch is in the BYPASS position (see Figure 77).
2. If an optional isolation transformer is installed, switch the input circuit breaker to the ON position (see Figure 26).
3. Switch ON the utility power where the UPS is connected.

   The load is now powered by utility power.
4. To transfer the load to the UPS, see paragraph 7.5 *Operating the Wall-Mounted Bypass Cabinet*.

7.2.5 Wall-Mounted Maintenance Bypass Startup

To start the UPS in maintenance bypass (wall-mounted operation):

1. Verify that the bypass breaker is in the OFF position (see Figure 31 or Figure 40).
2. Switch ON the utility power where the wall-mounted bypass cabinet is connected.
3. Switch the bypass breaker to the ON position.

   The load is now powered by utility power.
4. To transfer the load to the UPS, see paragraph 7.5 *Operating the Wall-Mounted Bypass Cabinet*.

7.3 Single UPS Shutdown

To shut down the UPS:

1. Press any button on the front panel display to activate the menu options.
2. Press the ↑ button on the front panel display and then press the → button to select the TURN UPS ON/OFF menu.
3. Press the ↵ button to select the TURN UPS OFF option.
4. Press and hold the ↵ button for three seconds, until the UPS stops beeping.

   The UPS stops supplying power to the load.
5. Switch the UPS battery circuit breaker to the OFF position.

   The UPS disconnects from the batteries and is on logic power only.
6. Switch OFF the utility power where the UPS is connected.

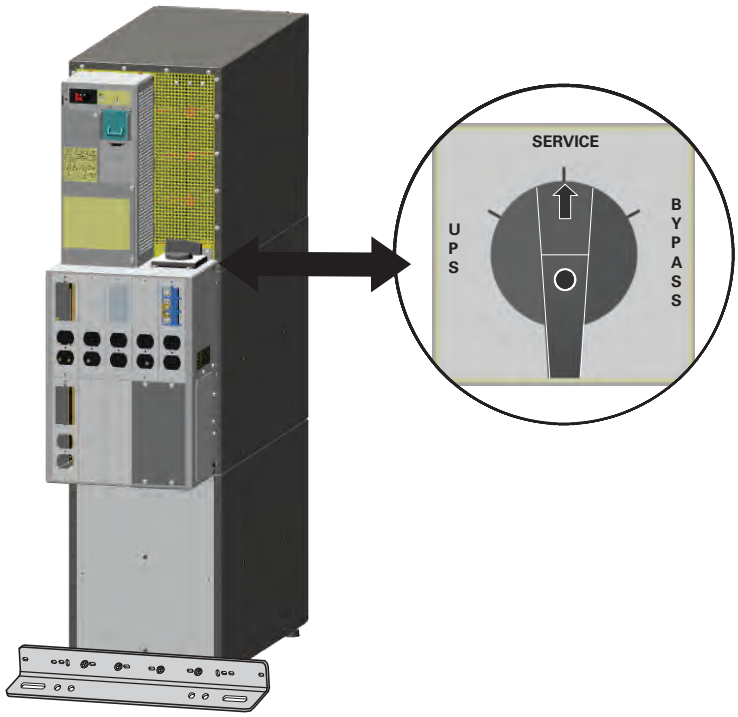
7.4 Operating the UPS Maintenance Bypass Switch

The UPS maintenance bypass switch is located on the back of the UPS (see Figure 77).

The maintenance bypass switch is used to bypass the UPS during maintenance or servicing. The switch provides a wrap-around bypass without shutting down the load. The SERVICE position on the switch allows a

service engineer to apply power to the UPS input and verify its operation while the load is powered through bypass.

Figure 77. Maintenance Bypass Switch



The UPS-mounted bypass switch has three positions as described in Table 13.

NOTE In the UPS or SERVICE position, AC input power is still connected to the input terminals inside the UPS.

Table 13. UPS-Mounted Bypass Switch Positions

Switch Position	Description
UPS	Connects the UPS output to the load.
SERVICE	Connects the load directly to AC input power and disconnects UPS output. AC input power is still connected to the UPS input.
BYPASS	Like the SERVICE position, BYPASS connects the load directly to AC input power and disconnects UPS output. However, because BYPASS also disconnects AC input from the UPS, this is the appropriate position for UPS maintenance or repair.

7.4.1 Single UPS Bypass

7.4.1.1 Transfer the load from the UPS to maintenance bypass:

1. Remove the cables and screws for any ConnectUPS Web/SNMP or PXGX card and then remove the x-slot card.

NOTE Before proceeding ensure that there are no active alarms or notices.

2. Set the system to internal Bypass mode:
   - Using the ↑ button on the front panel display, scroll to the **Control** menu option and press the → button.
   - Press the ↵ button to select the **Go to Bypass Mode** option.

     The indicator illuminates and the indicator extinguishes, indicating the UPS system is operating in Bypass mode.
3. Turn the Maintenance Bypass rotary switch on the back of the UPS to the SERVICE position.

   Verify the load is transferred by viewing the output meters screen.

   The Normal LED will be flashing.

   The UPS is now bypassed, with the load powered by utility power.
4. Command the UPS off.

   Press the ↑ button on the front display, scroll to the UPS On/Off menu. Press the → button to turn the UPS off.

   Rear fan is running signifying load is being supplied utility power on bypass.
5. Switch all of the UPS battery circuit breakers to the Off position.
6. Turn the Maintenance Bypass rotary switch on the back of the UPS to the BYPASS position.

7.4.1.2 Transfer the load from maintenance bypass to the UPS

1. Turn the maintenance bypass switch on the back of the UPS to the SERVICE position (see Figure 77).
2. Switch all of the UPS battery circuit breakers to the ON position.
3. Wait 1.5 to 2 minutes for the internal startup process to complete.

   Wait until the bypass indicator illuminates and the two front fans are operating before proceeding to the next step.

   Verify the output voltage is present on the meters screen.
4. Turn the maintenance bypass switch on the back of the UPS to the UPS position to return to Normal mode.

   When the green UPS normal indicator illuminates, the UPS is powering the load.

   Verify the load is transferred to the UPS by viewing the output meters screen.
5. Reinstall any ConnectUPS Web/SNMP or PXGX cards, secure with retained hardware and connect cables.

7.5 Operating the Wall-Mounted Bypass Cabinet

To transfer the load from the UPS to maintenance bypass:

1. Transfer the UPS to Bypass mode:

- Press any button on the front panel display to activate the menu options.
- Using the ↑ button on the front panel display, scroll to the Control menu option and press the → button.
- Press the ↵ button to select the Go to Bypass Mode option.

  The indicator illuminates and the indicator extinguishes, indicating the UPS system is operating in Bypass mode.

2. Switch the bypass breaker (may be designated MBP or CBP) in the wall-mounted bypass cabinet to the ON position.
3. If present, switch the maintenance isolation breaker (MIS) on the wall-mounted bypass cabinet to the OFF position; otherwise, switch the UPS breakers (may be designated MOB or UPS) on the wall-mounted bypass cabinet to the OFF position.

   The UPS is now bypassed, with the load powered by utility power.

To transfer the load from maintenance bypass to the UPS mode:

1. If the UPS was powered off, continue to Step 2.

   If the UPS is already in Bypass mode, proceed to Step 6.
2. Switch ON the utility power where the UPS is connected.
3. Wait for the front panel LCD to illuminate.

   The indicator flashes.
4. Switch all battery circuit breakers to the ON position.

   The indicator stops flashing.

   The UPS starts and transfers to Bypass mode. This may take up to 1 minute.

   The indicator flashes while transferring to bypass then goes out with the illuminating to indicate the UPS is operating in Bypass mode.

   The display indicates On Manual/Maintenance Bypass.
5. Verify voltage is present on the UPS output by checking that an output voltage reading present on the front panel LCD display.

   The load is now powered by utility power.
6. If present, switch the maintenance isolation breaker (MIS) on the wall-mounted bypass cabinet to the ON position; otherwise, switch the UPS breakers (may be designated MOB or UPS) on the wall-mounted bypass cabinet to the ON position.
7. Switch the bypass breaker (may be designated MBP or CBP) in the wall-mounted bypass cabinet to the OFF position.

   The UPS is now powering the load in Bypass mode.
8. Transfer the UPS to Normal mode:
   - Press the ↵ button to select the Go To Normal Mode option.
   - Press the ESC button until the Eaton logo appears.

     The UPS is now powering the load in Normal mode.

7.6 Configuring the UPS for EBMs

To ensure maximum battery runtime, configure the UPS for the correct number of EBMs:

1. Press any button on the front panel display to activate the menu options.
2. Using the ↑ button, scroll to the Settings menu.
3. Press the → button twice to select the User Settings menu.
4. Using the ↓ button, scroll to the Battery Setup menu and press the → button.
5. Using the ↓ button, scroll to the Number of Battery Strings option and press the → button.
6. Use the ↑ or ↓ buttons to select the number of strings according to your UPS configuration:

All 2-High UPS and EBM Cabinets*	**Number of Strings**
UPS + 1 EBM	6
UPS + 2 EBMs	10
UPS + 3 EBMs	14
UPS + 4 EBMs	18
All 3-High UPS and EBM Cabinets*	Number of Strings
UPS + 1 EBM	10
UPS + 2 EBMs	16
UPS + 3 EBMs	22

* UPS-32 models contain 2 strings; EBM-64 models contain 4 strings.
UPS-64 models contain 4 strings; EBM-96 models contain 6 strings.

7. Press the ↵ button to save the setting.
8. Press the ESC button until the Eaton logo or Mimic screen appears.

Chapter 8 UPS Maintenance

This section explains how to:

- Care for the UPS and batteries
- Recycle used batteries or UPS
- Use the maintenance bypass switch

8.1 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 77°F (25°C).

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.

8.1.1 Storing the UPS and Batteries

When storing the UPS and optional cabinets, the following requirements should be met:

- Verify that the battery circuit breaker is in the OFF position.
- Avoid temperature and humidity extremes. To maximize battery life, the recommended storage temperature is 59°F (15°C) to 77°F (25°C).
- If you store the UPS for a long period, recharge the batteries every 10 months by applying utility power. The batteries charge to 80% capacity in approximately 3 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.

8.2 When to Replace Batteries

When the  indicator flashes and the LCD panel displays Battery Failure, the batteries may need replacing. Contact your service representative to order new batteries.

Change the batteries approximately every five years.

8.3 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 9 Troubleshooting

The Eaton 9355 UPS 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.

9.1 Typical Alarms and Conditions

The following table describes typical alarms and conditions; check the Event Log through the control panel for a list of active alarms. If an alarm appears with a service code, please contact the Help Desk (see paragraph 1.8 *Getting Help*).

Alarm or Condition	Possible Cause	Action
On Battery  LED is on. 1 beep every second.	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 on. Continuous beep for 10 seconds.	The battery is running low.	Five minutes or less of battery power remains (depending on load configuration and battery charge). Save your work and turn off your equipment. When utility power is restored, the UPS restarts automatically, provides power to the load, and charges the battery.
Battery Breaker  LED is on. 1 beep every second.	The UPS does not recognize the internal batteries.	Verify the battery circuit breaker is in the ON position. If the condition persists, contact your service representative.
Overload  LED is on. 1 beep every second.	Power requirements exceed the UPS capacity (greater than 100% of nominal; see page 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 beep every second.	UPS internal temperature is too high or the fan has failed.	Turn the maintenance bypass switch to the SERVICE position. Otherwise, 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. If the alarm disappears, turn the maintenance bypass switch back to the UPS position. If the condition persists, contact your service representative.
Battery test failed	The batteries need service.	Contact your service representative.
The UPS does not start.	The main utility breaker is off.	Verify that the main utility breaker is on.

Alarm or Condition	Possible Cause	Action
	If an optional isolation transformer is installed, the input circuit breaker is off.	Verify that the isolation transformer input circuit breaker is on.
	The remote emergency power-off (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.
Power is not available at the UPS output receptacles.	The UPS is in Standby mode.	Supply power to the connected equipment: Press any button on the front panel display to activate the menu options. Press the ↑ button on the front panel display and then press the → button to select the TURN UPS ON/OFF menu. Press the ↓ button to select the TURN UPS ON option; press the ↵ button. Press and hold ↵ the button for three seconds, until the UPS stops beeping.
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.
	Battery circuit breakers are in the OFF position.	Switch all battery circuit breakers to the ON position.

9.2 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.

Chapter 10 Product Specifications

This section provides the following specifications:

- Model list
- Dimensions and weights
- Environmental and safety specifications
- Technical specifications
- Model specifications
- Battery specifications
- Battery runtimes

Table 14. Model List

UPS	Description	Power Rating
9355-10-32	2-high: UPS with one battery section 3-high: UPS with one battery and one isolation transformer section	10 kVA, 9 kW
9355-10-64	3-high: UPS with two battery sections	10 kVA, 9 kW
9355-15-32	2-high: UPS with one battery section 3-high: UPS with one battery and one isolation transformer section	15 kVA, 13.5 kW
9355-15-64	3-high: UPS with two battery sections	15 kVA, 13.5 kW
Extended Battery Module (EBM)	**Description**	
EBM-64	2-high: two battery sections	
EBM-96	3-high: three battery sections	

Table 15. Dimensions and Weights

	Dimensions (H x W x D)	Weight
2-High UPS	32.2" x 12" x 33.5" (81 x 30 x 85 cm)	381 lb (173 kg)
3-High UPS-32	47.8" x 12" x 33.5" (121.5 x 30 x 85 cm)	587 lb (266 kg)
3-High UPS-64	47.8" x 12" x 33.5" (121.5 x 30 x 85 cm)	619 lb (281 kg)
2-High EBM	32.2" x 12" x 30.3" (81 x 30 x 77 cm)	480 lb (218 kg)
3-High EBM	47.8" x 12" x 30.3" (121.5 x 30 x 77 cm)	710 lb (322 kg)

Table 16. Environmental and Safety Specifications

Operating Temperature	50°F to 104°F (10°C to 40°C) Optimal battery performance: 77°F (25°C)
Transit Temperature	-13°F to 131°F (-25°C to 55°C)
Storage Temperature	32°F to 77°F (0°C to 25°C) Recommended battery storage: 59°F to 77°F (15°C to 25°C)
Ventilation	Front air intake, forced air, two fans, positive pressurization, temperature UPS-monitored
Altitude	9,843 ft (3,000m) operating without derating 32,810 ft (10,000m) during transportation
Relative Humidity	5 95% noncondensing
Audible Noise	<56 dBA at 1 meter distance, typical loads<62 dBA for heavy load, high ambient or high altitude, on battery
Surge Suppression	ANSI C62.41 Category B3, IEC 61000-4-5
Safety Conformance	UL1778 5th Edition, CSA C22.2 No. 107.3-14, NOM-NYCE
Agency Markings	cULus, NOM-NYCE
EMC (Class A)	47 CFR Part 15/ICES-003 Class A

Table 17. Technical Specifications

Technology	Online, double conversion topology with static bypass switch and 3 position maintenance bypass switch. Frequency independent operation.
Input Voltage Range	75/130 144/249 Vac per phase
Input Power Factor	>0.99 at full load nominal line conditions
Input Rated Voltage	120/208 or 127/220 Vac three-phase
Isolation Transformer Input Voltage Range	480V or 600V ±20%60 Hz only
Input Frequency Range	45 65 Hz
Input Rated Frequency	50/60-Hz selectable, auto configuring
Output Voltage Regulation	±1% static, Phase to Neutral±2% static, Phase to Phase±5% dynamic at 100% resistive load change Response time <1 ms
Output Voltage Distortion	<2% THD linear load<5% THD non linear load
Output Frequency	50/60-Hz selectable or auto configuring
Output Frequency Regulation	Synchronization to line
Output Overload	101 110% for 10 minutes 111 125% for 60 seconds 126 149% for 5 seconds>150% for 300 milliseconds

Table 18. Model Specifications — 10 kVA Model

	10 kVA Model			
Output Voltage (Line Line)	208	208	208	220
Output Voltage (Line Neutral)	120	120	120	127
Input Voltage	208	480 (with input isolation transformer)	600V (with input isolation transformer)	220
Input Current	32.2A	16A	13.3A	30.5A
Output Current	27.8A	27.8A	27.8A	26.2A
Output kVA	10	10	10	10
Output kW	9	9	9	9
Efficiency (Minimum)	89%	83%	83%	89%
Heat Rejection [BTU/hr (kg-cal/hr)]	3798 (956)	6294 (1585)	6294 (1585)	3798 (956)

Table 19. Model Specifications — 15 kVA Model

	15 kVA Model			
Output Voltage (Line Line)	208	208	208	220
Output Voltage (Line Neutral)	120	120	120	127
Input Voltage	208	480 (with input isolation transformer)	600 (with input isolation transformer)	220
Input Current	48A	24A	20A	45.7A
Output Current	41.6A	41.6A	41.6A	39.4A
Output kVA	15	15	15	15
Output kW	13.5	13.5	13.5	13.5
Efficiency (Minimum)	90%	85%	85%	90%
Heat Rejection [BTU/hr (kg-cal/hr)]	5122 (1290)	8134 (2048)	8134 (2048)	5122 (1290)

Table 20. Battery Specifications

Battery Type	9 Ah sealed, valve-regulated lead acid (VRLA), maintenance-free, minimum 3-year float service life at 25°C (77°F), voltage 192 Vdc (96 cells per string)
Number of Strings	Maximum of 22 strings per full configuration, including UPS batteries (4 EBM-64 cabinets or 3 EBM-96 cabinets, plus UPS batteries)UPS-32: 2 strings; UPS-64: 4 strings EBM-64: 4 strings; EBM-96: 6 strings
Battery Replacement	Must be replaced by a qualified service technician
Charger	Service configurable 0.5 34A per string, with overall maximum of 34A (limited by input current). Default: 3.4A per string

Table 20. Battery Specifications (Continued)

Charging	Internal battery: approximately 3 hours to 80% usable capacity at nominal line voltage after full load discharge External battery: no more than 10x discharge time to 90% usable capacity at nominal line voltage after full load discharge
Start-on-Battery	Allows start of UPS without utility input
Performance	ABM technology increases battery service life, optimizes recharge time, and provides a warning before the end of useful battery life
Protection	Extended Battery Module output protected by 100A circuit breaker

Table 21. Battery Runtimes (in Minutes) at Full Load

2-High Cabinets					
Load	**32 Internal UPS Batteries**	**(1) EBM-64**	**(2) EBM-64**	**(3) EBM-64**	**(4) EBM-64**
15 kVA/13.5 kW	4	23	43	65	88
10 kVA/9 kW	8	37	69	106	144
3-High Cabinets					
Load	**64 Internal UPS Batteries**	**(1) EBM-96**	**(2) EBM-96**	**(3) EBM-96**	
15 kVA/13.5 kW	13	43	76	113	
10 kVA/9 kW	22	69	124	184	

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

Chapter 11 Warranty

To view the UPS warranty please click on the link or copy the address to download from the Eaton website:
UPS Product Warranty

https://www.eaton.com/content/dam/eaton/products/backup-power-ups-surge-it-power-distribution/backup-power-ups/portfolio/eaton-three-phase-ups-warranty.pdf

EQUIPMENT REGISTRATION

Please visit www.eaton.com/pq/register to register your new Eaton UPS / Eaton UPS Accessory.

Model Number:

Serial Number:

164201594 L0