

## GE EQUIPMENT LISTING

EQUIPMENT QUOTED FROM GE MEDICAL SYSTEMS  
 PER QUOTE/GON NO. XXX-XXXXXX DATED: XX/XX/XX  
 INSTALLED BY GEMS

| ITEM NO. | QUANTITY ORDERED | ITEM DESCRIPTION<br>(* = EXISTING/REINSTALL)     | WEIGHT   | HEAT OUTPUT |
|----------|------------------|--|----------|-------------|
| ①        | 1                | ANNULUS PHANTOM SAFE                             | 328 lbs  |             |
| ②        | 1                | OPERATOR'S CHAIR                                 |          |             |
| ③        | 1                | UPS SYSTEM                                       | 619 lbs  | 5122 btu    |
| ④        | 1                | POWER DISTRIBUTION UNIT                          | 815 lbs  | 3399 btu    |
| ⑤        | 1                | PARC 4   | 542 lbs  | 7897 btu    |
| ⑥        | 1                | DISCOVERY MI DR                                  | 8278 lbs | 24740 btu   |
| ⑦        | 1                | PATIENT TABLE<br>W/500 LB PATIENT                | 2312 lbs | 1023 btu    |
| ⑧        | 1                | STORAGE CABINET<br>(EMPTY CABINET WEIGHT)        | 99 lbs   |             |
| ⑨        | 1                | FREEDOM WORKSPACE LARGE TABLE<br>WITH 2 MONITORS | 154 lbs  | 3624 btu    |
| ⑩        | 1                | CONSOLE CABINET                                  | 158 lbs  |             |

## ANCILLARY ITEMS

### CUSTOMER/CONTRACTOR SUPPLIED AND INSTALLED ITEMS

| ITEM NO.   | ITEM DESCRIPTION<br>(* INDICATES EXISTING)  |
|--|---|
| <input type="checkbox"/>   |   |
| 61   | X-RAY ON WARNING LIGHT - AVAILABLE FROM GEXPRO<br>CALL: 800-200-9760 GE CAT. NO. WXIABWW-0F-XIU   |
| 62   | MINIMUM DOOR OPENING FOR EQUIPMENT DELIVERY IS<br>55 IN. W x 80 IN. H [1397mm x 2032mm], CONTINGENT<br>ON A 96 IN. [2438mm] CORRIDOR WIDTH  |
| 63   | DOOR LIMIT SWITCH<br><REQUIRED IN SOUTH CAROLINA, OTHERWISE<br>NEEDED ONLY IF REQUIRED BY STATE/LOCAL CODES>  |
| 64   | *COUNTERTOP WITH WALL CABINETS  |
| 65   | *COUNTER TOP FOR EQUIPMENT-<br>MINIMUM DEPTH 24 IN. AND ADDITIONAL SHELVING MAY BE<br>REQUIRED BELOW COUNTER TOP FOR PC TOWER. PROVIDE<br>GROMMETED OPENINGS AS REQUIRED TO ROUTE CABLES. |
| 66   | *FULL HEIGHT CONTROL WALL WITH LEAD GLASS VIEWING WINDOW  |
| <p>THE FOLLOWING ITEMS ARE AVAILABLE FROM THE GE MEDICAL SYSTEMS SERVICE DEPARTMENT. CONTACT YOUR LOCAL GE MEDICAL SYSTEMS SERVICE REPRESENTATIVE FOR PRICING AND AVAILABILITY OR CALL 1-800-558-2040.</p> |   |
| 90   | E4502RL WARNING LIGHT CONTROL<br>OR EQUIVALENT MAX 24V CONTROLLER.  |

THE CUSTOMER MUST PROVIDE ONE INTERNET ACCESSIBLE (VPN) NETWORK CONNECTION UNLESS BASED UPON SYSTEM CONFIGURATION THAT A DEDICATED DATA TELEPHONE LINE IS ACCEPTABLE

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| ITEM NO. | QUANTITY ORDERED | ITEM DESCRIPTION<br>(* = EXISTING/REINSTALL) | WEIGHT  | HEAT OUTPUT |
|----------|------------------|--|---------|-------------|
| 54       | 1                | MAIN DISCONNECT CONTROL                      | 132 lbs |             |

THE FOLLOWING ITEMS, WHICH HAVE BEEN ORDERED FROM GE MEDICAL SYSTEMS, ARE TO BE INSTALLED BY THE CUSTOMER OR HIS CONTRACTOR.

|    |   |                         |         |  |
|----|---|-------------------------|---------|--|
| 54 | 1 | MAIN DISCONNECT CONTROL | 132 lbs |  |
|----|---|-------------------------|---------|--|

# POWER SPECIFICATIONS

Discovery PET/CT 610/710 (64,128 SLICE)

(REV. DATE 09.Jul.12)

VOLTAGE

PRIMARY SOURCE IS REQUIRED FOR ALL INSTALLATIONS.  
RANGE OF LINE VOLTAGES: NOMINAL LINE VOLTAGE OF 380 TO 480, 3 PHASE, 50 OR 60 Hz.

RECOMMENDED POWER SUPPLY: WYE-CONNECTED

MAXIMUM DAILY VOLTAGE VARIATION MUST FALL WITHIN ONE OF THE RANGES IN TABLE A.

TABLE A  
ALLOWABLE  
INPUT  
VOLTAGES/  
CURRENT  
DEMAND

| NOMINAL VOLTAGE | ABSOLUTE RANGE | CURRENT (AMPS) |            | MINIMUM STANDARD OVERCURRENT PROTECTION |
|-----------------|----------------|----------------|------------|---|
|                 |                | MOMENTARY      | CONTINUOUS |   |
| 380             | 342-418        | 228            | 38         | 150-A                                   |
| 400             | 360-440        | 217            | 36         | 150-A                                   |
| 420             | 378-462        | 206            | 34         | 150-A                                   |
| 440             | 396-484        | 197            | 33         | 125-A                                   |
| 460             | 414-506        | 188            | 31         | 125-A                                   |
| 480             | 432-528        | 180            | 30         | 125-A                                   |

(ALL CALCULATIONS BASED UPON NOMINAL VOLTAGE)

PHASE-BALANCE.

PHASE-TO-PHASE VOLTAGES MUST BE WITHIN +2 PERCENT OF THE LOWEST PHASE-TO-PHASE VOLTAGE. THE MAXIMUM TRANSIENT VOLTAGE IS 1500V PEAK

VOLTAGE TRANSIENT OR IMPULSE ON THE INCOMING POWER MUST BE HELD TO A MINIMUM. TRANSIENTS CAUSED BY LIGHTNING, SURGES, LOAD SWITCHING, STATIC ELECTRICITY ETC. CAN CAUSE SCAN ABORTS OR, IN EXTREME INSTANCES, COMPONENT FAILURE IN THE COMPUTER SUBSYSTEM.

POWER DEMAND

CONTINUOUS POWER DEMAND = 30 KVA (MAX DEMAND = 150 KVA)

TABLE B  
MAXIMUM  
MOMENTARY  
POWER  
DEMAND.

| DEMAND          | DVCT System |
|-----------------|-------------|
| kVa *           | 150         |
| POWER FACTOR AT | 0.85        |

\* DEMAND INCLUDES POWER FOR ENTIRE SYSTEM.  
LINE VOLTAGE REGULATION AT MAXIMUM POWER DEMAND MUST BE LESS THAN OR EQUAL TO 6 PERCENT.

DISTRIBUTION TRANSFORMER

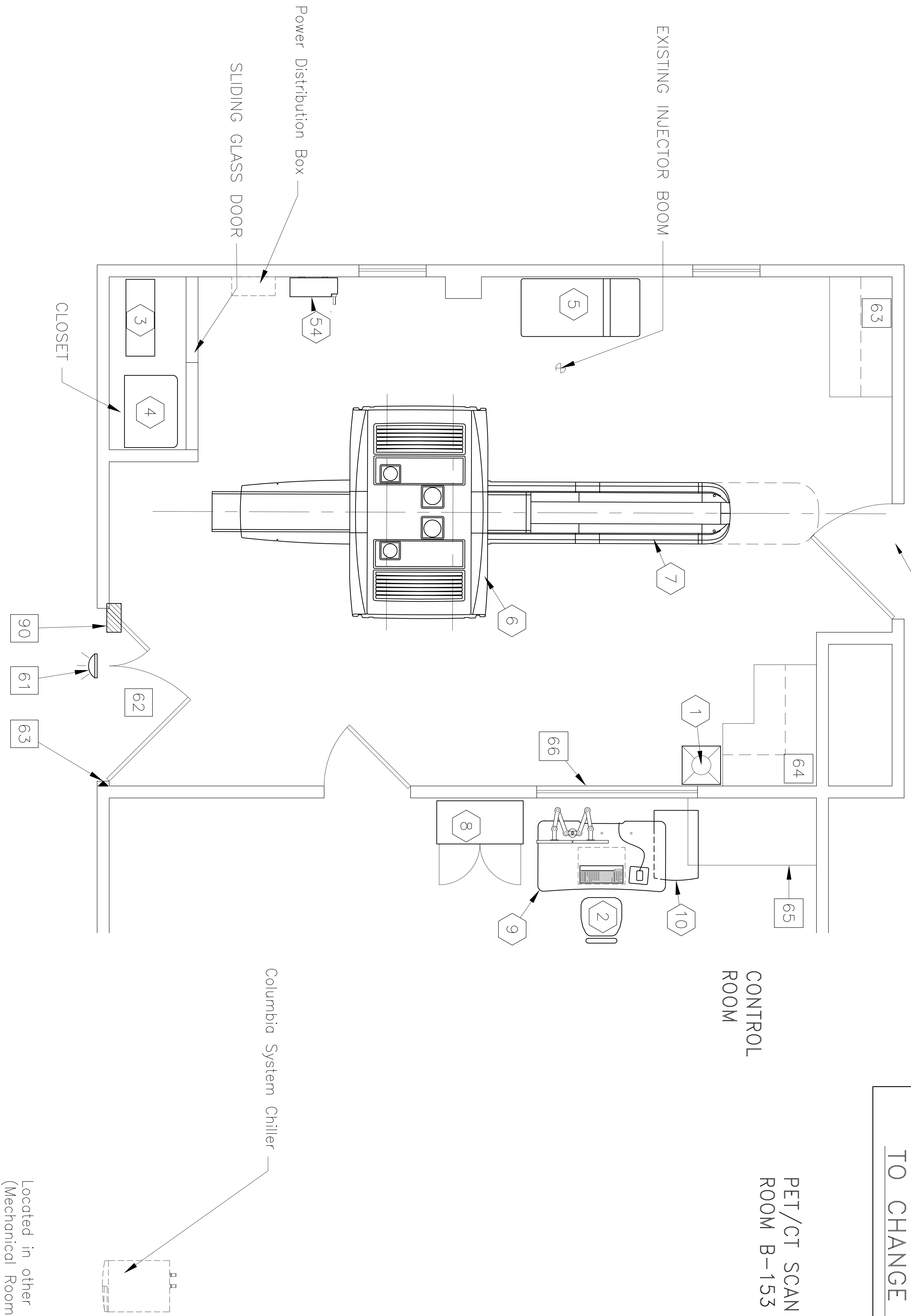
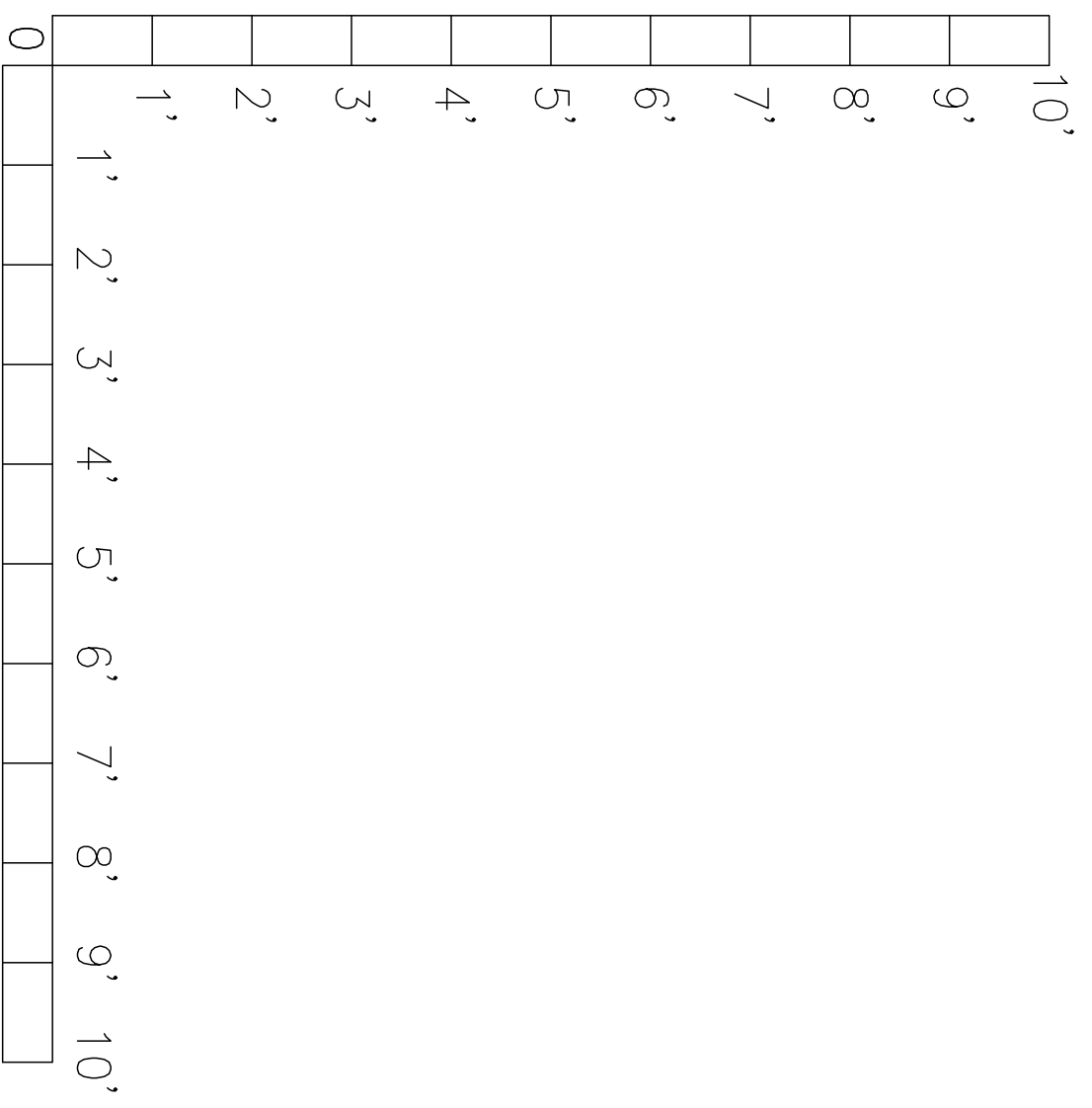
FOR A SINGLE UNIT INSTALLATION, THE MINIMUM TRANSFORMER SIZE IS 225 KVA. GE DOES NOT RECOMMEND USING A REGULATION DEVICE.

NOTE: THE SYSTEM MUST NOT BE POWERED IN A MULTIPLE INSTALLATION WHERE FILM CHANGERS ARE USED. FILM CHANGERS UTILIZE A LARGE NUMBER OF HIGH POWERED CLOSELY SPACED EXPOSURES WHICH MAY COINCIDE WITH THE SCAN.

THIS PRODUCT IS 510(K) PENDING AT FDA. ACTUAL SITE SPECIFICATIONS MAY CHANGE BASED ON THE SPECIFICATIONS OF THE FINAL CLEARED, COMMERCIALY AVAILABLE PRODUCT.

NOTE: IF THIS DOORWAY LEADS TO AN UNCONTROLLED AREA, AN ADDITIONAL WARNING LIGHT AND DOOR SWITCH MAY BE REQUIRED. CONSULT WITH PHYSICIST.

**ALL INFORMATION IN THIS DRAWING SET IS PRELIMINARY, SUBJECT TO CHANGE !!**



PRELIMINARY PLANNING ONLY

PROJECT TITLE:  
**LEXINGTON VA MEDICAL CENTER**  
 LEXINGTON, KY  
 SCHEME NO.: S16-1020A DRAWN BY: BAP/RF DATE: 2.Jan.18

THIS LAYOUT MUST BE APPROVED BEFORE FINAL DRAWINGS CAN BE STARTED. THANK YOU

CUSTOMER \_\_\_\_\_ DATE: \_\_\_\_\_

GE INSTALL. SPECIALIST \_\_\_\_\_ DATE: \_\_\_\_\_

**GE Healthcare**

Modality Installation Planning

Milwaukee, Wisconsin

# GE HEALTHCARE - E4502KW Uninterruptible Power Supply (UPS) Solutions for VCT

## ULTRA-HIGH SPEED PWM UPS With Maintenance Bypass & Load Distribution

Product Focus – 160KVA/144KW



160KVA/144KW UPS Module  
(matching pre-wired and attached  
maintenance bypass and load  
breakers not pictured)



Matching Battery Cabinet is  
provided fully assembled  
and with interconnect  
harnessing to the UPS  
Module

### Features

- Provides unmatched power performance for efficiency, input current harmonic distortion (THD), and power factor.
- Scalable for capacity and redundancy to meet present and future power needs.
- Provides peace-of-mind that your batteries will be ready when you need them with innovative three-stage charging, battery health-checks, optional temperature-compensated charging, and remote monitoring.
- Extremely small system footprint and the flexibility to install against walls, using top- or bottom-entry cabling. The ENTIRE System (i.e. UPS, Bypass and Batteries) occupies a small footprint and is truly front access only for installation and maintenance.
- Pre-wired and attached 3-Circuit Breaker Maintenance Bypass panel with Load Distribution Circuit Breakers means lower installation time and costs.
- Provides a one-year factory warranty on parts and labor, Start-up service, one year of remote eMonitoring, on-site preventive maintenance, and optional service plans.
- On-site and telephone technical support provided 24-hours per day, every day.

The Uninterruptible Power System (UPS) for GE Healthcare is a double-conversion UPS that resolves all utility power problems and supplies clean, continuous, uninterruptible power to connected equipment. When you're selecting a UPS for the GE Volume CT (VCT) this is the system that will deliver just the right combination of performance and price for your needs.

Advanced design delivers unequalled power performance. The innovative design of this UPS delivers the industry's best performance combination of efficiency, input current distortion and power factor

The solid-state UPS operates at a high efficiency of up to 94 percent, reducing utility costs and extending battery run times. Higher system efficiency produces cooler operating conditions, which reduces facility air conditioning cost, extends the life of UPS components, and increases overall reliability, availability, and performance.

A new input circuit design keeps input current THD low and input power factor near unity without compromising overall efficiency. As a result, this UPS system allows maximum transfer of power between power sources and protected load and is exceptionally compatible with multiple power sources, especially auxiliary generators.

On the output side, the ultra high speed switching Pulse Width Modulation (PWM) inverter enables the UPS system to provide its full rated power capability to the load whether the load power factor is 0.9 lagging, unity, or 0.9 leading. Double-conversion design offers the highest protection possible.

Unlike some other commercially available UPS technologies, the double-conversion design completely isolates output power from all input power anomalies and delivers 100-percent conditioned, perfect sine-wave output—regulating both voltage and frequency.

Even when presented with the most severe power problems, power output remains stable. Output voltage THD is held within two percent of nominal specification for linear loads, within five percent for non-linear loads—making the GE approved VCT UPS ideal for supporting equipment that is sensitive to a distorted voltage input as a result of harmonic loads. In the event of a utility power failure, there is no delay transferring to backup power.

**UPS control innovations optimize battery performance and service life**

Integra ABM<sup>®</sup> (Advanced Battery Management) technology uses a unique three-stage charging technique that significantly extends battery service life and optimizes recharge time, compared to traditional trickle charging. An integrated battery management system tests and monitors battery health and remaining lifetime, and provides advance notification to guide preventive maintenance. Optional temperature-compensated charging monitors temperature changes and adjusts the charge rate accordingly to properly charge the battery and greatly extend battery life.

A variable battery bus accommodates 384V to 480V configurations, so the battery capacity can be matched to your exact runtime requirements—either a specific runtime, an extension to existing battery runtime, or legacy battery installations. With remote monitoring of the UPS and battery system, Eaton is there with you—able to respond to alarms and real-time battery data to avert potential battery problems.

**Industry-leading warranty and service plans deliver peace of mind**

We are so confident about the performance and reliability of the GE approved VCT UPS and battery system that we back it up with the industry's most extensive warranty and service plans. The Powerware 9390 UPS features a one-year service package that includes 7x24 Start-Up service, a 7x24 UPS Performance Check, one-year of 7x24 full corrective maintenance and one-year of web remote monitoring of both the UPS and batteries.

Beyond the warranty period, service plans are available to match any need—from basic UPS and/or battery support to all-inclusive packages with unique features, such as advanced remote monitoring with trending, customized UPS and battery capacity planning reports, and comprehensive power protection audits. And of course, the UPS comes with the Powerware Software Suite of products, which provides monitoring, management, and optional shutdown capabilities over your network. Connectivity options are available to suit nearly any communication requirement, from standard serial communications to secure remote monitoring over the web.



7x24 Remote Monitoring Services at the Customer Reliability Center



UPS Front Panel Display providing detailed information on UPS, load and Utility Power status. Alarm Event History Log documents previous on-site electrical power events

**Scalable architecture meets your current and future load requirements**

The 160KVA UPS can be field upgraded in the future should the load demands increase. Up to four equivalent UPS modules can be paralleled for additional capacity or redundancy, without having to utilize a central paralleling cabinet. Up to eight UPS modules can be paralleled by utilizing a module tie cabinet. In all paralleling configurations, each UPS module operates independently yet is completely synchronized with the others. Parallel UPS modules can provide N+1, N+2, or greater redundancy.

**Flexible installation options expedite deployment and save valuable space**

By far, this UPS offers the smallest footprint of any UPS in its class—35 to 50 percent smaller than competitive units. Cabling can enter the UPS from either the top or bottom of the cabinet to provide easier and flexible installation. The GE approved VCT UPS provides front panel access for all services and operation, increasing serviceability and reducing Mean Time to Repair (MTTR). And since the compact system design can be installed against back and side walls, you have more location options, installation is fast and easy, deployment cost is lower, and you save valuable data center space for future expansion.

# Technical Specifications

## UPS Rating (0.9 power factor)

kVA 160  
kW 144

## General Characteristics

Efficiency Up to 94%  
Heat Dissipation 43.8KBTU/Hr Maximum at full load  
Parallel Capability 4x modules w/o tie cabinet; 8x with tie cabinet  
Audible Noise <65dBA @ 1 meter  
Altitude (max) 2000m at 40°C

## Input Characteristics

Voltage 480  
Voltage Range +10% / -30%  
Frequency Range 55-65 Hz  
Power Factor 0.99 (min)  
Input Current Distortion <4.5% (no input filter required)  
Soft Start Capability  
Internal Back-feed Protection

## Output Characteristics

Voltage 480<sub>s</sub>  
Regulation ±1%  
Inverter PWM with IGBT Switching  
Voltage THD <2% (100% linear load); <5% (non-linear load)  
Load Power Factor Range 0.9 lagging to 0.9 leading

## Battery

Battery Type VRLA  
Battery Voltage 480V  
Charging Method Advanced Battery Management Technology  
Battery Reserve time (7) minutes at 125KW (VCT Max Technique)

## Dimensions & Weights

UPS Module 35.6"w x 31.6"d x 73.7"h, weight 900 pounds  
Battery Cabinet 42.7"w x 31.6"d x 73.7"h, weight 3,150 pounds  
IAC 22.5"w x 31.6"d x 73.7"h, weight 360 pounds

## User Benefits

Control Panel (LCD) 8 lines x 40 characters  
Battery Start-up Standard  
Frequency Conversion Standard  
Multi-language Standard  
Building Alarm Inputs 2 (galvanic isolated)

## Serviceability

Back/Side Against Wall Standard  
Installation

## Accessories

External Three Breaker Maintenance Bypass included  
Integrated 250A (adjustable to 150A) and 100A load breakers included

## Certification

Safety UL1778, cUL  
EMC FCC Class A  
Surge ANSI C62, 41 Cat. A&B

## Web Remote Monitoring Service

7 x 24 remote monitoring of 43 UPS and battery alarms, daily heartbeat check and monthly report

## Communications

Software Compatibility - PowerVision®, LanSafe™, FORESEER®  
Communication Cards - Standard system includes one ConnectUPS Web/SNMP card with an Environmental Monitoring Probe. Two communication bays standard. Maximum of four communication bays with the communication expansion option. The following connectivity options can be installed at any time:  
- ConnectUPS Web/SNMP/xHub Card  
- Modbus Card  
- Relay Interface Card (Use for AS/400s)  
- Industrial Relay Card (5A@120V)  
- Hot Sync CAN Bridge Card provides CAN communications, isolated RS-485 port

## Environmental Monitoring Probe (EMP)\*\*

Remote Inputs/Outputs - Two building alarms inputs and one summary alarm contact (5A@120V) standard

Four more building alarm inputs available with the Communication Expansion Option

Remote Monitor Panel - Eight backlit status indicator lamps plus an audible horn\*\*

\*See the Limited Factory Warranty for Powerware 9390 Products for details. Batteries are warranted by the battery manufacturer and not by Eaton.

\*\*Requires the ConnectUPS Web/SNMP/xHub card.

\*\*\*Requires the Parallel Card option (RS-485 port) and requires an external 120V power supply to drive the remote monitor panel.

1. Due to continuing improvements, specifications are subject to change without notice.

7x24 On-Site & Telephone  
Technical Support  
8609 Six Forks Road  
Raleigh, NC 27615 U.S.A.  
Toll Free: 1.800.843.9433

Rev 02/06





**GE Healthcare  
Model E4502KW**

**Uninterruptible Power Supply (UPS)  
Solution for Volume CT (VCT)**

**Installation Support Document**

For Questions or Clarifications  
Please contact GE Healthcare  
Or any of the following:

Powerware Technical Support (800) 843-9433  
Tom McCaughn (414) 443-3521

**Important Note to Installer!**  
**Initial power to the UPS system is not  
to be supplied until the final installation  
is complete and a qualified Powerware  
Corporation Customer Support  
Engineer (CSE) is on-site and has  
validated the installation.**

Failure to follow these instructions may void the  
manufacturers warranty and damage the  
equipment. Schedule site validation services in  
advance by calling Powerware at (800) 843-9433.  
Please have the equipment serial number and site  
information present when calling.

## **INSTALLATION SUPPORT DOCUMENT CONTENTS**

- A. E4502KW specifications with cabinet dimensions.
- B. Integrated Accessories Cabinet (maintenance bypass) installation instructions and drawings.
- C. System electrical one-line diagram.
- D. System layout drawing. The Integrated Accessories Cabinet (IAC - Maintenance Bypass Sidecar Cabinet) is the point of all system external electrical connections to the AC Mains and Critical Load.

## **LINE-AND MATCH INSTALLATIONS**

The three system cabinets bolt together in a line-up-and-match arrangement, electrically connecting to each other using electrical conductors and hardware supplied by the manufacturer. The system line-up drawing is located on page 21 (A-2), the IAC pg. 38 (A-19), UPS pg. 40 (A-46) and Battery pg. 42 (A-21).

## **REMOTE MOUNTED CABINET INSTALLATIONS**

Please contact the manufacturer for installation instructions relevant to each cabinet when cabinets are to be installed remote of each other.

## **ADDITIONAL INSTALLATION INFORMATION**

For additional information pertaining to the installation and operation of the UPS module, battery cabinet and Integrated Accessories (maintenance bypass) Cabinet (IAC), please refer to the following documents, which are delivered with each shipment:

- A. Eaton Powerware Integrated Accessories Cabinet (IAC) Installation and Operations Manual for GE Healthcare, document number 164201627.
- B. Eaton Powerware 9390 UPS (100-160KVA) Installation & Operations Manual, document number 164201604.
- C. Eaton Powerware Integrated Battery Cabinet (Model IBC-S & IBC-L) Installation Manual, document number 164201536.

## **SHIPPING SPLITS**

Job-site shipments for this configuration will include the following:

- A. IAC Cabinet, palletized, measuring approximately 36" w x 54" d x 76" h, weighing 780 pounds.
- B. UPS Cabinet, palletized, measuring approximately 44" w x 54" d x 76" h, weighing 1,050 pounds.
- C. Battery Cabinet, palletized, measuring approximately 44" w x 54" d x 76" h, weighing 3,345 pounds.

*Shipping dimensions are approximate, and are larger than actual equipment dimensions*

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Battery Cabinet 43.5"w x 31.6"d x 73.7"h, weight 3,245 pounds  
IAC 23.72"w x 31.6"d x 73.7"h, weight 715 pounds

## User Benefits

Control Panel (LCD) 8 lines x 40 characters  
Battery Start-up Standard  
Frequency Conversion Standard  
Multi-language Standard  
Building Alarm Inputs 2 (galvanic isolated)

## Serviceability

Back/Side Against Wall Standard  
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## Accessories

External Three Breaker Maintenance Bypass included  
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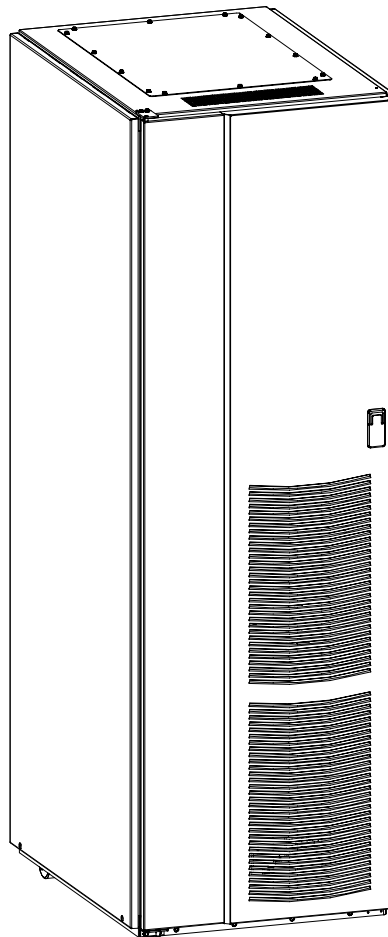
Rev 07/2011

## Chapter 1 | Introduction

The Powerware® 9390 Integrated Accessory Cabinet (IAC) for GE Medical is designed for use with the 160 kVA 480/480V three-phase Uninterruptible Power Systems. The IAC provides maintenance bypass and output breaker functions.

The Maintenance Bypass (MBP) and Maintenance Isolation (MIS) breakers enable power to completely bypass the UPS power module. The UPS module can then be safely serviced or replaced without interrupting power to critical systems. The Bypass Input Breaker (BIB) provides a single wiring point input to the UPS as well as a convenient method for removing power from the UPS when using the maintenance bypass to supply the load. Two output distribution breakers provide output control for the critical loads.

The IAC is housed in a single, free-standing cabinet, with safety shields behind the doors for hazardous voltage protection. The cabinet matches the UPS cabinet in style and color, and can be installed in *line-up-and-match* or *standalone* configurations. Figure 1-1 shows the Powerware 9390 IAC.



**Figure 1-1. Powerware 9390 IAC for GE Medical**

## Chapter 2 | IAC Installation Plan and Unpacking

Use the following basic sequence of steps to install the Integrated Accessory Cabinet (IAC).

1. Create an installation plan for the IAC (Chapter 2).
2. Prepare your site for the IAC (Chapter 2).
3. Inspect and unpack the IAC (Chapter 2).
4. Unload and install the IAC and wire the system (Chapter 3).
5. Complete the Installation Checklist (Chapter 3).
6. Have authorized service personnel perform preliminary operational checks and startup.



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**NOTE** *Startup and operational checks must be performed by an authorized Powerware Customer Service Engineer, or the warranty terms specified on page W-1 become void. This service is offered as part of the sales contract for the UPS system. Contact service in advance (usually a two-week notice is required) to reserve a preferred startup date.*

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### 2.1 Creating an Installation Plan

Before installing the IAC, read and understand how this manual applies to the system being installed. Use the procedures and illustrations in the following chapters to create a logical plan for installing the system.

### 2.2 Preparing the Site

For the IAC to operate at peak efficiency, the installation site should meet the environmental parameters outlined in this manual. If the IAC is to be operated at an altitude higher than 1500m (5000 ft), contact your Powerware service representative for important information about high altitude operation. The operating environment must meet the weight, clearance, and environmental requirements specified in Drawing 164201627-2 on page A-3 and size requirements specified on Drawing 164201627-8 starting on page A-19.

The IAC uses natural convection cooling to regulate internal component temperature. Air inlets are in the front of the cabinet and outlets are in the top (see Drawing 164201627-8 starting on page A-19). Allow clearance above, below, and in front of each IAC, for proper air circulation. See Drawing 164201627-2 on page A-3 for clearances.

## 2.2.1 Environmental Considerations

The life of the IAC is adversely affected if the installation does not meet the following guidelines:

- ▶ The system must be installed on a level floor suitable for computer or electronic equipment.
- ▶ The system must be installed in a temperature and humidity controlled indoor area free of conductive contaminants.

Failure to follow guidelines may void your warranty.

## 2.2.2 Preparing for Wiring the IAC

Power and control wiring for a line-up-and-match IAC are supplied with the cabinet.

Wiring requirements for an IAC installed separate from the UPS cabinet, including the minimum AWG size of external wiring, can be found on Drawing 164201627-4 starting on page A-5. The input power wiring connections for this equipment are rated at 90°C. If wire is run in an ambient temperature greater than 40°C, higher temperature wire and/or larger size wire may be necessary. IAC control wiring requirements can be found on Drawing 164201627-7 starting on page A-15 and should be connected at the IAC interface terminal block located inside the IAC.

## 3.3 IAC Cabinet Installation

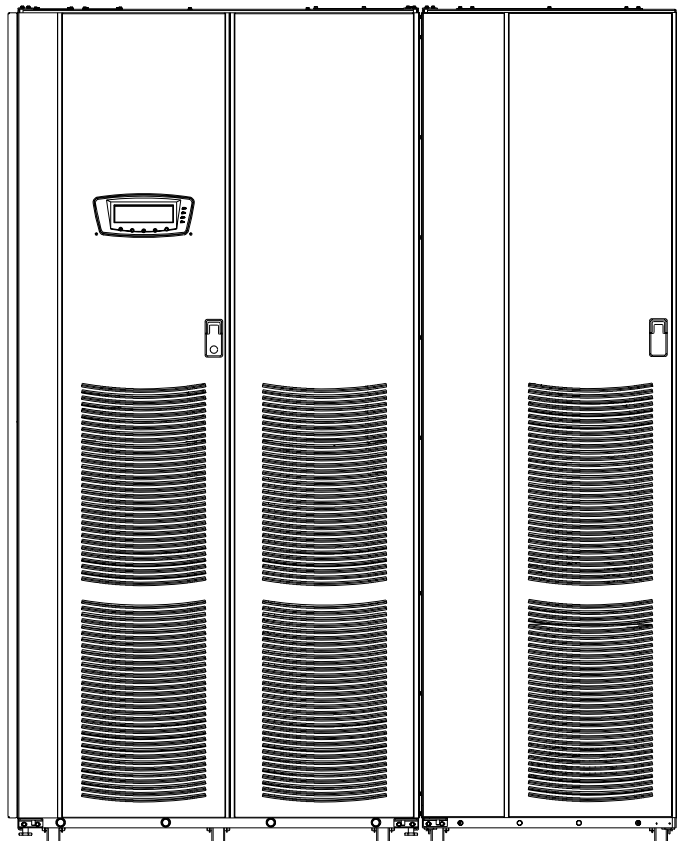
The method used to install the IAC depends on the type of installation. The IAC can be installed as a *line-up-and-match* or *standalone* system. The term *line-up-and-match* refers to cabinets that are physically attached to the UPS, and the wiring between them is internal. The term *standalone* refers to cabinets that are not physically attached to the UPS, and are wired with external contractor-supplied wiring.

- ▶ To install a *line-up-and-match* IAC, proceed to paragraph 3.3.1.
- ▶ To install a *standalone* IAC, proceed to paragraph 3.3.3.

### 3.3.1 Line-up-and-Match IAC Installation

Use this procedure to install the IAC adjacent to the Powerware 9390 UPS cabinet (see Figure 3-3). The recommended location is to the right of the UPS cabinet. This procedure assumes the IAC is located to the right of the UPS cabinet.

1. Verify that the UPS is properly installed and secured. Refer to the applicable Powerware 9390 Installation and Operation manual, listed in paragraph 1.4, for installation instructions.
2. Roll the IAC to an area near the right-hand side of the UPS.
3. If not already open, unfasten the IAC front door latch and swing the door open.



**Figure 3-3. 160 kVA UPS with Line-up-and-Match IAC**

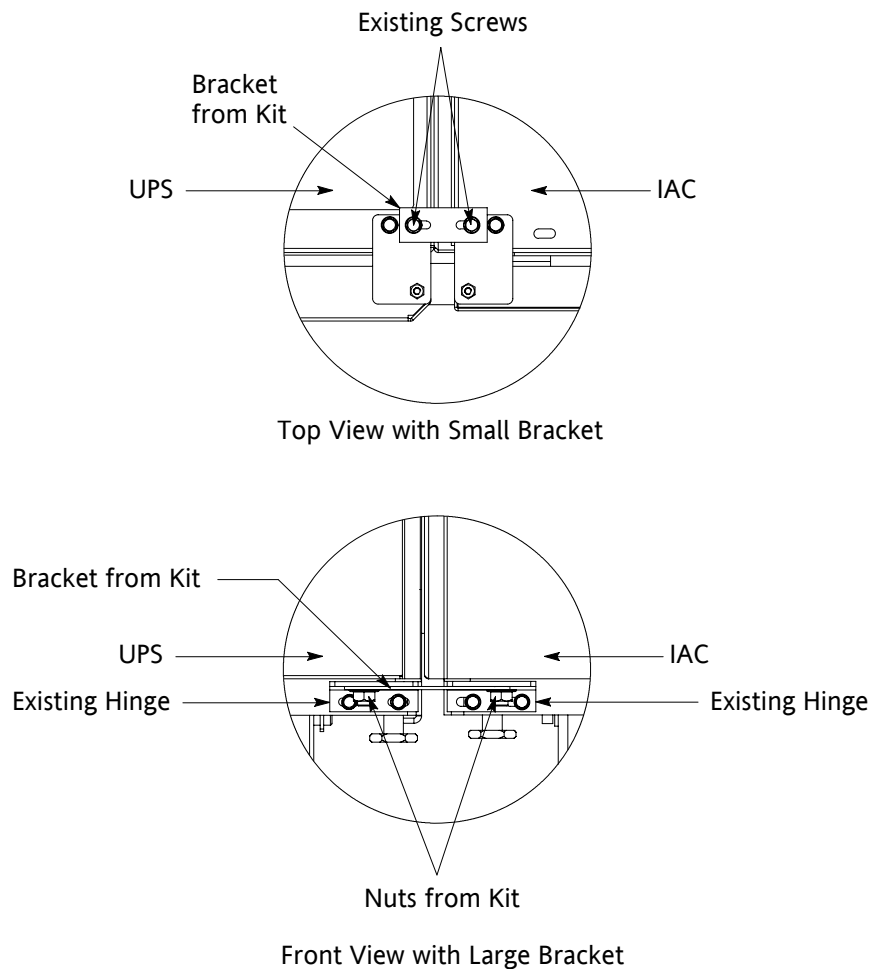
4. If not already removed, remove the door. Remove the retaining screws located inside the door at the top and bottom hinge pivot points, then lift the door off. Save the retaining screws for reinstallation of the door.
5. Remove the screws securing the internal safety shield panels, and remove the panels to gain access to the inside of the cabinet.
6. Remove the field kit from the bottom of the cabinet and retain for later use.
7. If necessary, remove the cosmetic cover and hanger brackets from the right-hand side of the UPS. Save the cover, screws, and brackets for later use.
8. If necessary, remove the cosmetic cover and hanger brackets from the left-hand side of the IAC. Save the cover, screws, and brackets for later use.
9. Remove the knockouts, as required, on the bottom right side of the UPS cabinet inside panel. Refer to the applicable Powerware 9390 Installation and Operation manual, listed in paragraph 1.4, for the location of the knockout plug.
10. Remove the knockouts on the bottom left side of the IAC inside panel (see Drawing 164201627-5, sheet 2 of 2 on page A-9).
11. Install the nylon grommets from the field kit around the edges of the knockout holes.
12. Push the IAC toward the UPS cabinet until the doors are flush with each other.
13. If not already installed, mount the hanger brackets to the top right side of the IAC using M4 screws (see Drawing 164201627-5, sheet 2 of 2 on page A-9).
14. If not already installed, hang the side panel on the hanger brackets and align with the front and rear of the IAC.
15. If not already secured, secure the side panel at the bottom using M4 hex-head screws previously removed.
16. If permanently mounting the IAC, proceed to Step 19; otherwise, proceed to Step 17.
17. Secure the IAC in position by lowering the leveling feet until the cabinet is not resting on the casters. Verify the cabinet is level and matches the height of the installed UPS cabinet.
18. Proceed to Step 21.
19. Using the retained hardware, reinstall the shipping brackets previously removed to the front and rear of the IAC with the angle facing outward (see Figure 3-1 on page 3-3 and Figure 3-2 on page 3-4).
20. Secure the cabinet to the floor with contractor-supplied hardware.
21. Remove the right-hand screw from the top right-hand door hinge of the UPS cabinet and the left-hand screw from the top left door hinge of the IAC.





**NOTE** Two cabinet joining brackets are provided in the field kit for securing each cabinet at the top and bottom. A small flat bracket joins the top of the cabinets and a larger flat bracket joins the cabinets at the bottom. The small flat bracket is attached to the cabinet tops first.

22. Locate the small flat bracket from the field kit. Align the holes in the small flat bracket over the door hinge screw holes. Replace the screws in the hinges, securing the bracket to the cabinets (see Figure 3-4).



**Figure 3-4. 160 kVA UPS to IAC Joining Brackets**

23. Locate the large flat bracket from the field kit. Place one end of the bracket over the bolt on the bottom side of the lower right-hand hinge on the UPS cabinet and the other end over the bolt on the bottom side of the lower hinge on the IAC (see Figure 3-4).
24. Secure the bracket to the hinges with large nuts from the field kit.
25. Proceed to paragraph 3.3.2.

### 3.3.2 Installing IAC Line-up-and-Match MBP Power Wiring



**NOTE** *The IAC is shipped with a debris shield covering the ventilation grill on top of the unit. Do not remove the debris shield until installation is complete. However, remove the shield before operating the IAC. Once the debris shield is removed, do not place objects on the ventilation grill.*

**NOTE** *Remove the IAC cabinet top or bottom conduit landing plate to drill or punch conduit holes, or remove knockouts (see Drawing 164201627-5 starting on page A-9).*

**NOTE** *Refer to the applicable Powerware 9390 Installation and Operation manual, listed in paragraph 1.4, for UPS cabinet wiring information, and conduit and terminal locations.*

1. Verify the UPS system is turned off and all power sources are removed. Refer to the applicable Powerware 9390 Installation and Operation manual, listed in paragraph 1.4, for shutdown instructions.
2. If not already open, unfasten the IAC front door latch and swing the door open.
3. If not already removed, remove the door. Remove the retaining screws located inside the door at the top and bottom hinge pivot points, then lift the door off. Save the retaining screws for reinstallation of the door.
4. If not already removed, remove the screws securing the internal safety shield panels and remove the panels to gain access to the terminals.
5. An IAC-to-UPS output wiring harness is supplied inside the IAC. Route this harness through the knockouts in the side of the cabinets to the UPS output terminals. Refer to the applicable Powerware 9390 Installation and Operation manual, listed in paragraph 1.4, for UPS cabinet terminal locations and termination requirements. See Drawing 164201627-6, starting on page A-11, for IAC wiring access information and terminal locations.
6. Connect phase A, B, and C, and, if required, Neutral power wiring to the UPS output terminals.
7. Route the bypass input cables from the utility source to the IAC MBP bypass input terminals. See Drawing 164201627-6, starting on page A-11, for IAC wiring access information and terminal locations.
8. Connect phase A, B, and C, and, if required, Neutral bypass input power wiring from the utility source to the IAC MBP bypass terminals.
9. An IAC-to-UPS input wiring harness is supplied inside the IAC. Route the harness through the knockouts in the side of the cabinets to the UPS input terminals. Refer to the applicable Powerware 9390 Installation and Operation manual, listed in paragraph 1.4, for UPS cabinet terminal locations and termination requirements. See Drawing 164201627-6, starting on page A-11, for IAC wiring access information and terminal locations.

- 10.** Connect phase A, B, and C, and, if required, Neutral power wiring to the UPS input and terminals.
- 11.** Route the output cables from the critical loads to the IAC CB30 and CB31 output terminals. See Drawing 164201627-6, starting on page A-11, for IAC wiring access information and terminal locations.
- 12.** Connect phase A, B, and C, and, if required, Neutral power wiring from the IAC CB30 and CB31 output terminals to the critical loads.
- 13.** After wiring the UPS system to the facility power and critical load, be sure to ground the system according to local and/or national electrical wiring codes.
- 14.** If wiring interface connections, proceed to paragraph 3.3.5; otherwise, proceed to Step 15.
- 15.** When all wiring is complete, reinstall the safety shield panels removed in previous steps.
- 16.** Reinstall the doors removed in previous steps and secure with the retained hardware.
- 17.** Close the door and secure the latch.

## 3.4 Initial Startup

Startup and operational checks must be performed by an authorized Powerware Customer Service Engineer, or the warranty terms specified on page W-1 become void. This service is offered as part of the sales contract for the UPS system. Contact service in advance (usually a two-week notice is required) to reserve a preferred startup date.

## 3.5 Completing the Installation Checklist

The final step in installing the IAC is completing the following Installation Checklist. This checklist ensures that you have completely installed all hardware, cables, and other equipment. Completing all items listed on the checklist will ensure a smooth installation. Make a copy of the Installation Checklist before filling it out, and retain the original.

After the installation is complete, a service representative will be able to verify the operation of the UPS system and commission it to support the critical load. The service representative cannot perform any installation tasks other than verifying software and operating setup parameters. Service personnel may request a copy of the completed Installation Checklist to verify all applicable equipment installations have been completed.



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**NOTE** *The Installation Checklist MUST be completed prior to starting the UPS system for the first time.*

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## Chapter 4 | Understanding IAC Operation

The Integrated Accessory Cabinet (IAC) is configured for maintenance bypass operation.

### 4.1 UPS Mode

When the maintenance bypass switch (MBP) is open, and the maintenance isolation switch (MIS) is closed, conditioned and protected power from the UPS is routed through the MIS to load distribution breakers CB30 and CB31. Power is then distributed to the critical loads through CB30 and CB31.

Power is supplied to the UPS input terminals through the bypass input breaker (BIB). In a single-feed system, the UPS rectifier and bypass input terminals are jumpered together and power is supplied to the UPS from a single source.

Figure 4-1 shows the path of electrical power through the IAC when operating in UPS mode.

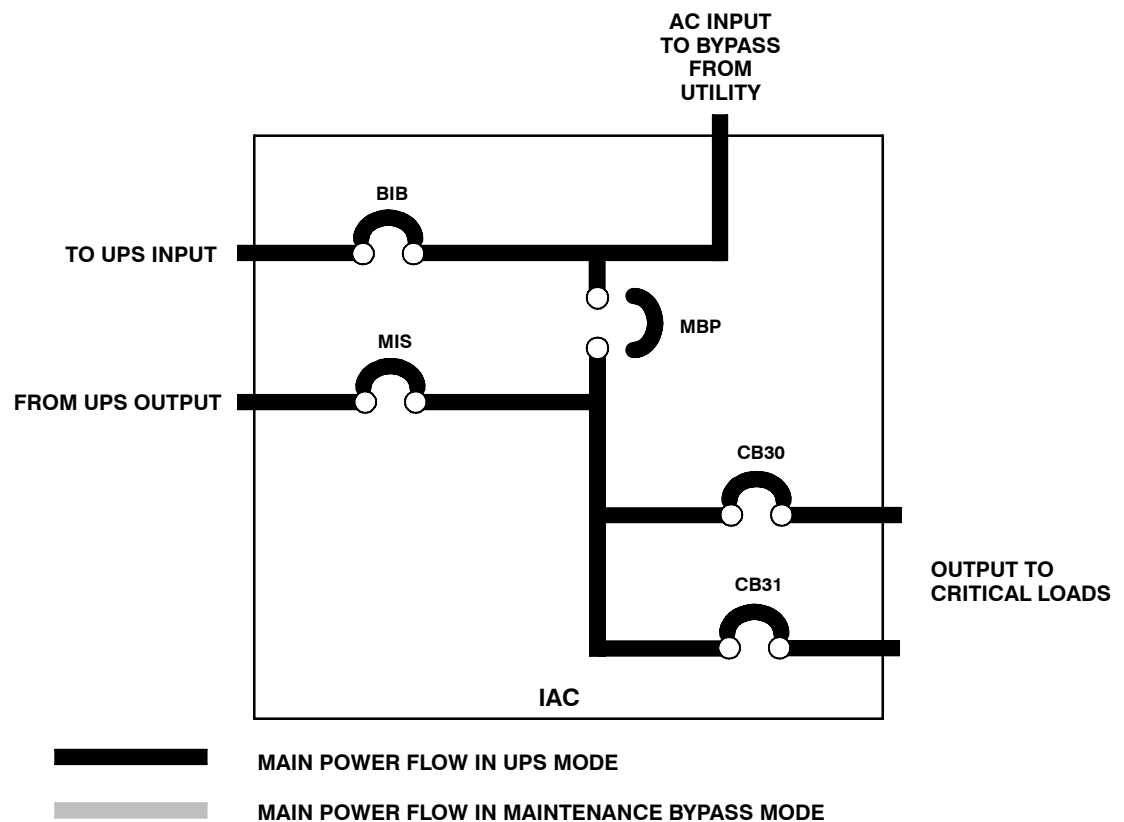


Figure 4-1. Path of Current Through the IAC in UPS Mode

## 4.2 Maintenance Bypass Mode

A MBP is used to safely supply utility power to the critical load during periods of UPS maintenance or repairs. The bypass source supplies the commercial AC power to the load directly.

When the MBP is closed, the load is wrapped around the UPS while power is still supplied to the load by the UPS through the MIS and load distribution breakers CB30 and CB31. The MIS is then opened, isolating the UPS from the bypass power source. The UPS can then be safely shut down without interrupting power to the critical load, and power removed from the UPS by opening the BIB. The UPS now can be serviced or replaced safely.

The critical load is not protected while the UPS is in Maintenance Bypass mode.

Figure 4-2 shows the path of electrical power through the IAC when operating in Maintenance Bypass mode.

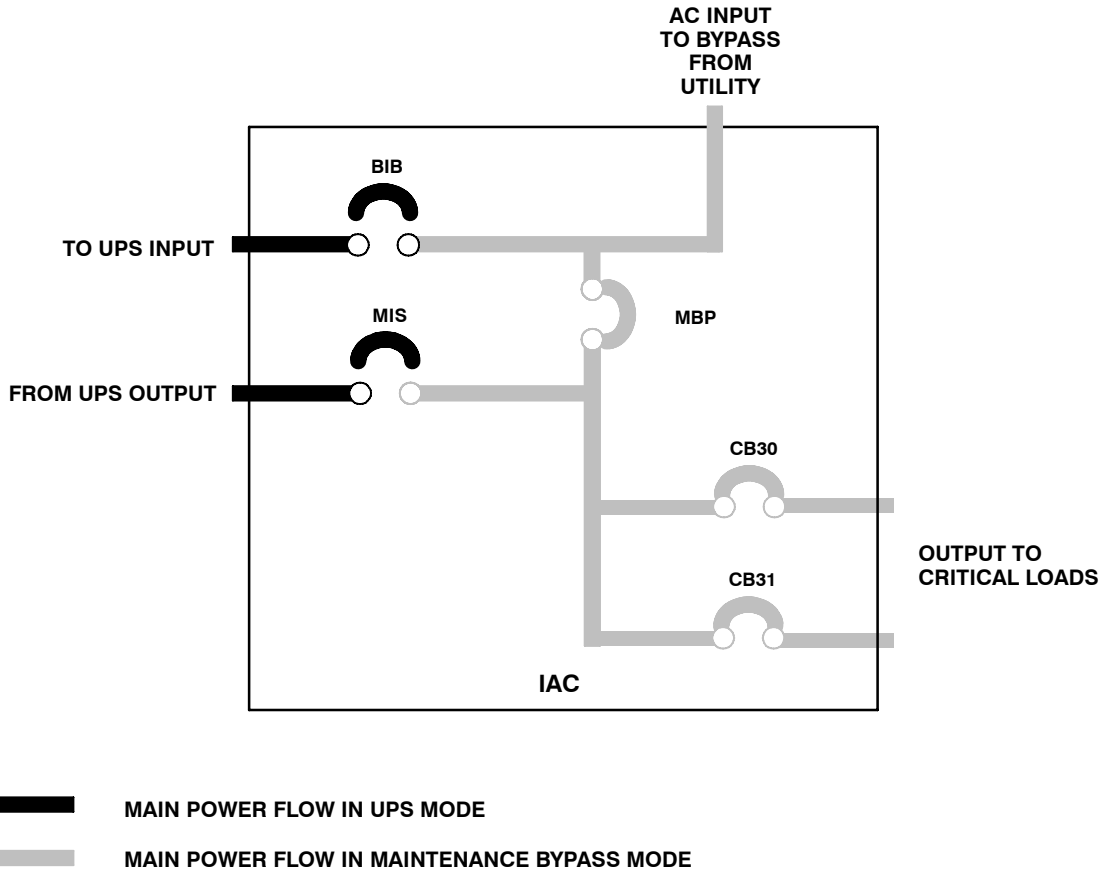


Figure 4-2. Path of Current Through the IAC in Maintenance Bypass Mode

## Chapter 5 | IAC Features, Options, Controls, and Operation

### 5.1 IAC Standard Features

The IAC has many standard features that provide cost-effective and consistently reliable power distribution. The following descriptions provide a brief overview of the IAC controls, and standard and optional features.

#### 5.1.1 Maintenance Bypass

A maintenance bypass switch (MBP), in combination with the maintenance isolation switch (MIS), can be used to completely isolate the UPS during service. The UPS can be serviced or replaced without interrupting power to critical systems.

#### 5.1.2 Bypass Input Breaker

The bypass input breaker (BIB) provides a single point of input power control to the UPS and easily removes power from the UPS for servicing.

#### 5.1.3 Load Distribution Breakers

Load distribution breakers CB30 and CB31 provide single point output control for the critical loads.

#### 5.1.4 Maintenance Bypass Switch Monitoring

The IAC uses one UPS building alarm input to detect when the maintenance bypass switch is closed and the system is on bypass.

#### 5.1.5 Installation Features

The IAC can be installed in *line-up-and-match* or *standalone* configurations. The cabinet can be permanently bolted to the floor or left standing on leveling feet. Power and control wiring can be routed through the top or bottom of the cabinet with connections made to easily accessible terminals. Line-up-and-match cabinets are wired through knockouts in the side panels of the units.

## 5.2 Symbols

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



**ON** - Indicates the circuit breaker is in the “On” position.



**OFF** - Indicates the circuit breaker is in the “Off” position.



**PHASE** - The word “phase.”



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



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



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

## 5.3 IAC Controls

Figure 5-1 identifies and shows the location of the controls on the Powerware 9390 IAC.



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**NOTE** *Read the operation sections of this manual and the applicable Powerware 9390 UPS Installation and Operation Manual, listed in paragraph 1.4, and have thorough knowledge of UPS operation before attempting to operate any of the IAC controls.*

---

The IAC contains the following controls:

- ▶ Maintenance Bypass Switch
- ▶ Maintenance Isolation Switch
- ▶ Bypass Input Breaker
- ▶ Load Distribution Breaker CB30
- ▶ Load Distribution Breaker CB31



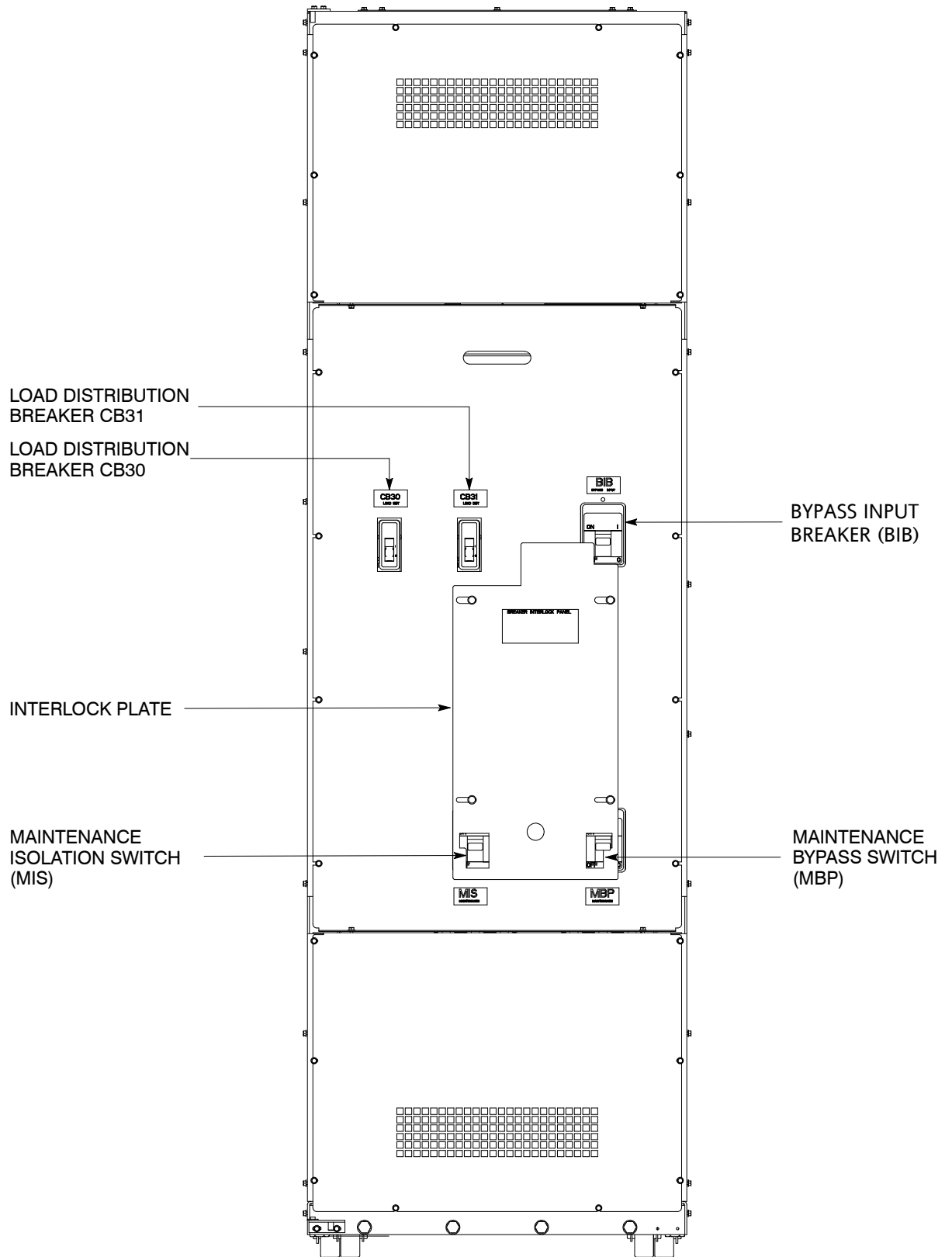


Figure 5-1. Powerware 9390 IAC Controls

## 5.4 IAC Operation

### 5.4.1 Using the UPS when an IAC is Installed



**NOTE** Before starting the UPS with the IAC, verify all installation tasks are complete and a preliminary startup has been performed by authorized service personnel. The preliminary startup verifies all electrical interconnections to confirm the installation was successful and the UPS operates properly.

1. Unfasten the IAC front door latch and swing the door open.
2. Verify that the IAC circuit breakers and switches are set as follows:

|  |        |
|--|--------|
| IAC Maintenance Bypass Switch (MBP)    | OPEN   |
| IAC Maintenance Isolation Switch (MIS) | CLOSED |
| IAC Bypass Input Breaker (BIB)         | CLOSED |
| IAC Load Distribution Breaker CB30     | OPEN   |
| IAC Load Distribution Breaker CB31     | OPEN   |

3. Start the UPS in Normal mode according to the instructions in the operation chapter of the applicable Powerware 9390 Installation and Operation manual, listed in paragraph 1.4.
4. Close IAC load distribution breakers CB30 and CB31.
5. Close the front door and secure the latch.

### 5.4.2 Transferring the UPS to Maintenance Bypass

#### CAUTION



Only trained personnel familiar with the operation of this equipment should transfer loads. Failure to follow this transfer sequence may cause loss of power to loads or overload protection devices to activate.

#### CAUTION



In Bypass mode, the critical load is not protected from commercial power interruptions and abnormalities.

1. Press the **CONTROLS** button on the main menu bar. The System Controls screen appears.
2. Press the **BYPASS** button on the System Controls menu bar.

The UPS transfers to Bypass mode and the critical load is immediately supplied by the bypass source. If the bypass source is not available, the power processor remains on and an alarm sounds.

3. Verify that the **BYPASS** status indicator is illuminated, indicating the UPS is operating in Bypass mode.
4. Press the → button on the System Controls screen to display System Controls Screen 2.
5. Press the **PM OFF** button on the System Controls menu bar.

The power module (PM) status indicates SHUTDOWN. The input and output contactors open, the battery breaker or disconnect is tripped, and the power module is turned off. The bypass source supplies the critical load.



### WARNING

Power is present inside the UPS and IAC cabinets.

6. Unfasten the IAC front door latch and swing the door open.
7. Close the MBP.
8. Slide the interlock plate to the left.
9. Open the MIS.
10. Open the BIB.
11. Close the front door and secure the latch.

## 5.4.3 Transferring the UPS from Maintenance Bypass



### CAUTION

Only trained personnel familiar with the operation of this equipment should transfer loads. Failure to follow this transfer sequence may cause loss of power to loads or overload protection devices to activate.



### CAUTION

In Bypass mode, the critical load is not protected from commercial power interruptions and abnormalities.

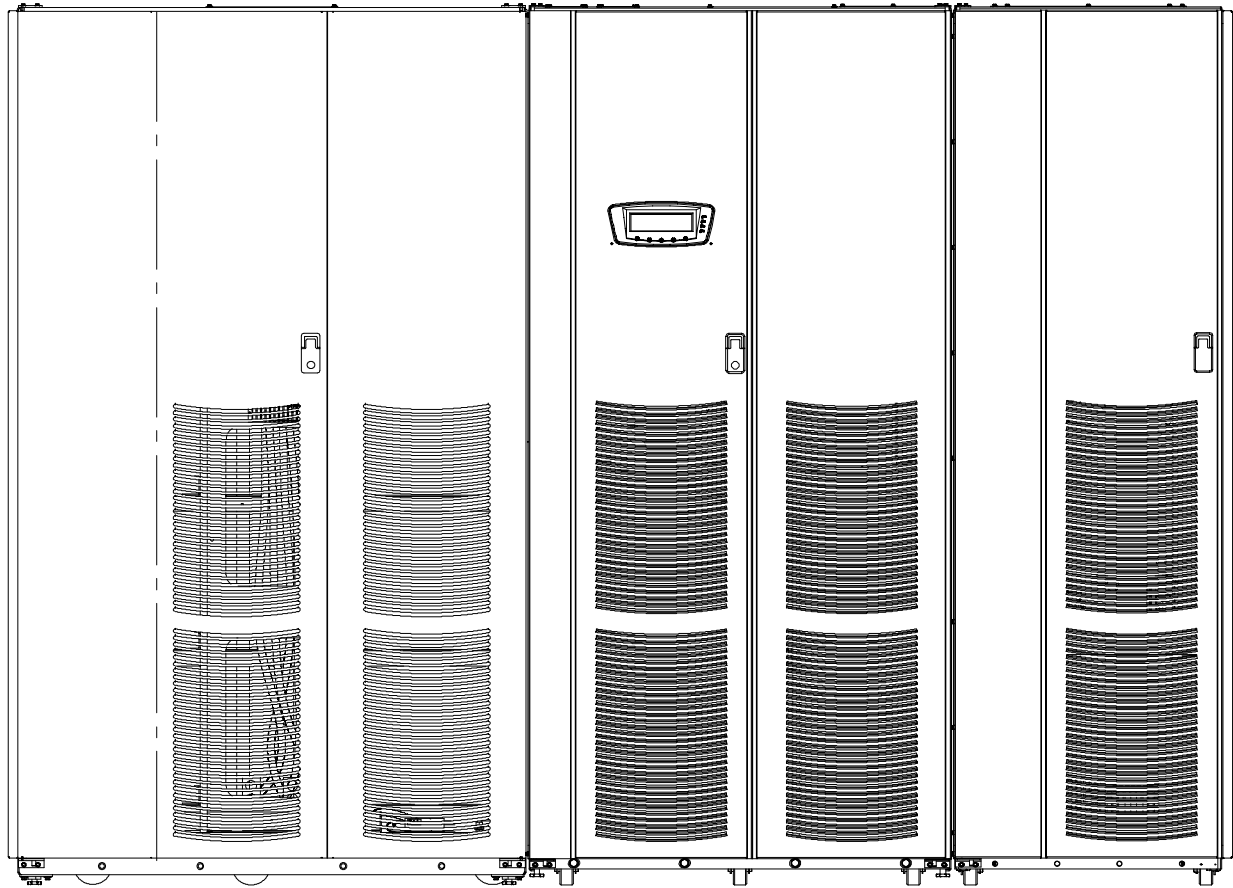
1. Unfasten the IAC front door latch and swing the door open.
2. Close the BIB.
3. Verify that the UPS is operating and is in Bypass mode. Refer to the applicable Powerware 9390 Installation and Operation manual, listed in paragraph 1.4.
4. Close the MIS.
5. Slide the interlock plate to the right.
6. Open the MBP.

7. Close the front door and secure the latch.
8. Transfer the UPS to Normal mode by pressing the **CONTROLS** button on the main menu bar. The System Controls screen appears.
9. Press the **NORMAL** button on the System Controls menu bar.

The UPS transfers to Normal mode, and the **NORMAL** status indicator is illuminated.

If the power processor is not available, the system remains on bypass and an alarm sounds.

10. Close the front door and secure the latch.



**BATTERY CABINET**

**160 kVA  
UPS CABINET**

**IAC**

|   |             |                      |
|---|-------------|----------------------|
| <b>DESCRIPTION: TYPICAL POWERWARE 9390 UPS SYSTEM WITH INTEGRATED ACCESSORY CABINET</b> |             |                      |
| <b>DRAWING NO:</b>  | 164201627-1 | <b>SHEET:</b> 1 of 1 |
| <b>REVISION:</b>  | A           | <b>DATE:</b> 011506  |

1. The IAC equipment operating environment must meet the weight requirements shown in Table A and size requirements shown on Drawing 164201627–8.
2. The IAC is palletted separately for shipping.
3. Do not tilt cabinets more than  $\pm 10^\circ$  during handling.
4. Dimensions are in millimeters (inches).

| <b>Table A. Equipment Weight</b>                         |                           |                  |                      |
|--|---------------------------|------------------|----------------------|
| <i>Component/Model</i>                                   | <i>Weight<br/>Kg (lb)</i> |                  |                      |
|  | <i>Shipping</i>           | <i>Installed</i> | <i>Point Loading</i> |
| Powerware 9390 IAC with an MBP, MIS, BIB, CB30, and CB31 | 353.8 (780)               | 324.3 (715)      | 4 at 81 (179)        |

5. The clearances required around the IAC are shown in Table B.

| <b>Table B. IAC Clearances</b> |  |
|--------------------------------|--|
| From Top of Cabinet            | Minimum clearance over the cabinet is 457.2 mm (18 inches) for ventilation |
| From Front of Cabinet          | 914.4 mm (36 inches) working space   |
| From Back of Cabinet           | None Required  |
| From Right Side of Cabinet     | None Required  |
| From Left Side of Cabinet      | None Required  |

6. The basic environmental requirements for operation of the IAC are:

**Ambient Temperature Range:** 0–40°C (32–104°F)

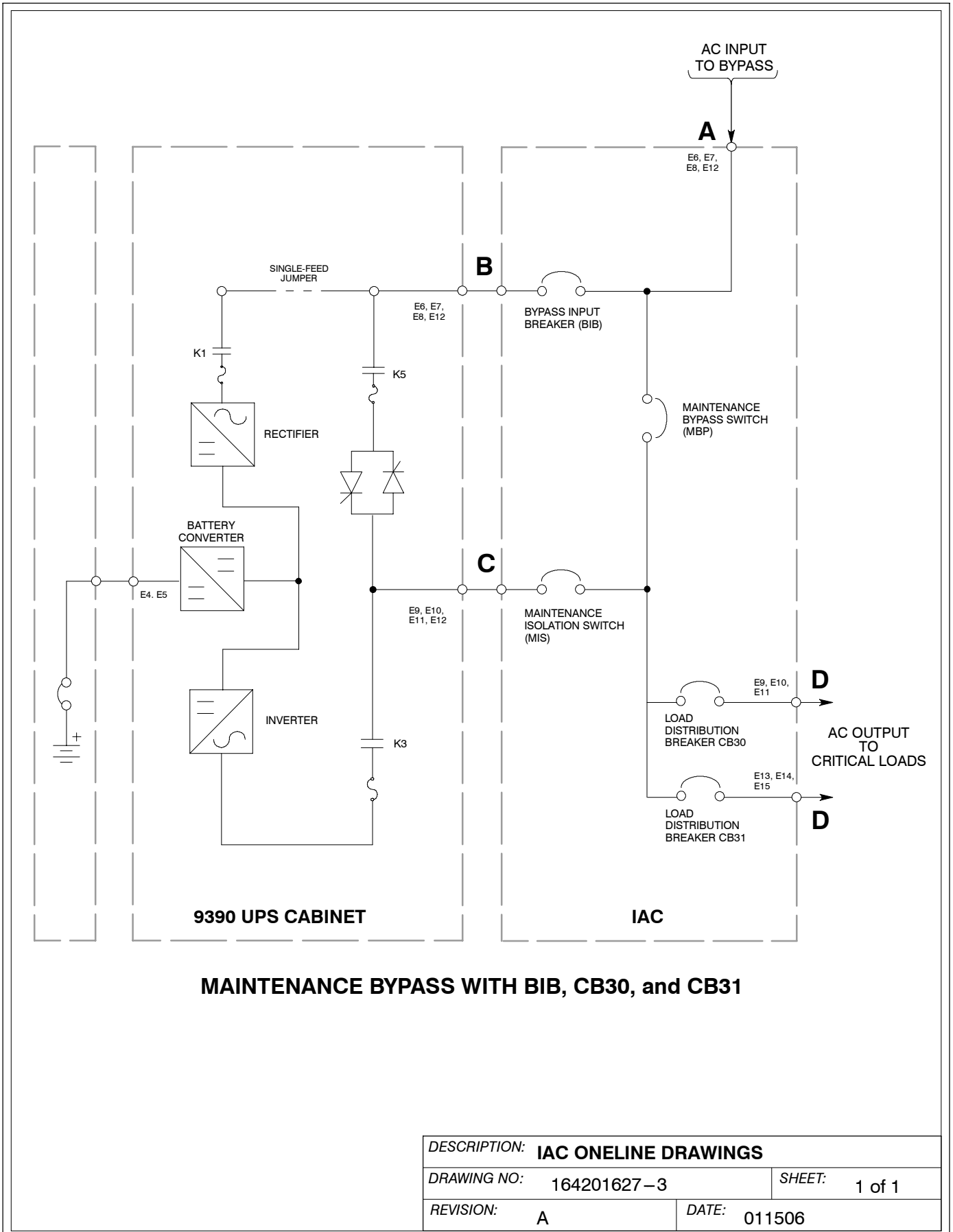
**Recommended Operating Range:** 20–25°C (68–77°F)

**Maximum Relative Humidity:** 95%, noncondensing

The IAC ventilation requirements are shown in Table C.

| <b>Table C. Air Conditioning or Ventilation Requirements During Full Load Operation</b> |                             |  |
|---|-----------------------------|--|
| <i>Component/Model</i>  | <i>Input/Output Voltage</i> | <i>Heat Rejection<br/>BTU/hr × 1000/hr (Kg–cal/hr)</i> |
| Powerware 9390 IAC  | N/A                         | N/A  |

|   |                      |
|---|----------------------|
| <i>DESCRIPTION:</i> <b>PHYSICAL FEATURES AND REQUIREMENTS</b> |                      |
| <i>DRAWING NO.:</i> 164201627–2                               | <i>SHEET:</i> 1 of 1 |
| <i>REVISION:</i> A  | <i>DATE:</i> 011506  |



| <b>Table D. INPUT/OUTPUT Ratings &amp; External Wiring Requirements for Powerware 9390 IAC</b>  |          |   |   |
|---|----------|---|---|
|   |          | <b>Units</b>  | <b>Rating 50/60 Hz</b>  |
| <b>Basic Unit Rating</b>  |          | KVA   | 160   |
| Input and Bypass Input  |          | VOLTS   | 480   |
| Output  |          | VOLTS   | 480   |
| <b>AC Input to Maintenance Bypass</b><br>(Line-up-and-Match or Standalone Installation)<br>(single-feed with BIB)<br>(3) Phases, (1) Neutral –if required, (1) Ground<br><br>Minimum Conductor Size<br>Number per Phase | <b>A</b> | AMPS  | 210   |
|   |          | AWG or kcmil (each)   | 1/0<br>(2)  |
| <b>AC Output from BIB to UPS</b><br>(Standalone Installation)<br>(3) Phases, (1) Neutral –if required, (1) Ground<br><br>Minimum Conductor Size<br>Number per Phase   | <b>B</b> | AMPS  | 210   |
|   |          | AWG or kcmil (each)   | For contractor-supplied wiring, refer to the applicable Powerware 9390 UPS Installation and Operation manual, listed in paragraph 1.4. Wiring for line-up-and-match installation is factory-supplied. |
| <b>AC Input from UPS</b><br>(Standalone Installation)<br>(3) Phases, (1) Neutral –if required, (1) Ground<br><br>Minimum Conductor Size<br>Number per Phase   | <b>C</b> | AMPS  | 192   |
|   |          | AWG or kcmil (each)   | For contractor-supplied wiring, refer to the applicable Powerware 9390 UPS Installation and Operation manual, listed in paragraph 1.4. Wiring for line-up-and-match installation is factory-supplied. |
| <b>AC Output to Critical Load</b><br>(Line-up-and-Match or Standalone Installation)<br>Full Load Current<br>(3) Phases, (1) Neutral –if required, (1) Ground  | <b>D</b> | Wire branch circuits in accordance with branch circuit breaker manufacturer's ratings, and national and local electrical codes. Maximum output ratings are to be in accordance with the rating label on the IAC and not to exceed 250A. The total combined load is not to exceed the UPS output rating. |   |

**NOTE:** Callout letters **A, B, C,** and **D** map to drawing 164201627-3.

|   |                      |
|---|----------------------|
| <b>DESCRIPTION:</b> POWER WIRING INSTALLATION NOTES |                      |
| <b>DRAWING NO:</b> 164201627-4                      | <b>SHEET:</b> 1 of 4 |
| <b>REVISION:</b> A                                  | <b>DATE:</b> 011506  |



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

1. Refer to national and local electrical codes for acceptable external wiring practices.
2. Material and labor for external wiring requirements are to be provided by designated personnel.
3. For external input wiring, use 90°C copper wire. See the appropriate column in Table D. Wire sizes are based on using the specified breakers.
4. Wire ampacities are chosen from Table 310–16 of the NEC. Input wire is 90°C specification.
5. Refer to Section I of this manual for installation instructions.
6. Refer to the applicable Powerware 9390 UPS Installation and Operation manual, listed in paragraph 1.4, for UPS cabinet wiring requirements, and conduit and terminal locations.
7. Terminals are UL and CSA rated at 90°C. Refer to Table E for power cable terminations. Drawing 164201627–6 shows the location of the power cable terminals inside the UPS cabinet.
8. Per NEC article 300-20(a), all three-phase conductors must be run in the same conduit. Neutral and ground must be run in the same conduit as the phase conductors.
9. Conduit is to be 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, size the conduit to accommodate the extra wire or size. All Powerware 9390 products can accommodate a double-sized neutral.

|  |                      |
|--|----------------------|
| <i>DESCRIPTION:</i> <b>POWER WIRING INSTALLATION NOTES</b> |                      |
| <i>DRAWING NO:</i> 164201627–4                             | <i>SHEET:</i> 2 of 4 |
| <i>REVISION:</i> A   | <i>DATE:</i> 011506  |

| <i>Terminal Function</i>              | <i>Terminal</i>              | <i>Function</i> | <i>Size of Pressure Termination</i>    | <i>Tightening Torque Nm (lb in)</i> | <i>Type Screw</i>     |
|---------------------------------------|------------------------------|-----------------|--|-------------------------------------|-----------------------|
| <b>AC Input to Maintenance Bypass</b> | MBP-2 (E6)                   | Phase A         | 1 – 2/0–250 kcmil<br>1 – 2/0–500 kcmil | 31.1 (275)<br>31.1 (275)            | 5/16" Hex<br>3/8" Hex |
|                                       | MBP-4 (E7)                   | Phase B         | 1 – 2/0–250 kcmil<br>1 – 2/0–500 kcmil | 31.1 (275)<br>31.1 (275)            | 5/16" Hex<br>3/8" Hex |
|                                       | MBP-6 (E8)                   | Phase C         | 1 – 2/0–250 kcmil<br>1 – 2/0–500 kcmil | 31.1 (275)<br>31.1 (275)            | 5/16" Hex<br>3/8" Hex |
| <b>AC Output from BIB to UPS</b>      | BIB-2                        | Phase A         | 1 – 2/0–250 kcmil<br>1 – 2/0–500 kcmil | 31.1 (275)<br>31.1 (275)            | 5/16" Hex<br>3/8" Hex |
|                                       | BIB-4                        | Phase B         | 1 – 2/0–250 kcmil<br>1 – 2/0–500 kcmil | 31.1 (275)<br>31.1 (275)            | 5/16" Hex<br>3/8" Hex |
|                                       | BIB-6                        | Phase C         | 1 – 2/0–250 kcmil<br>1 – 2/0–500 kcmil | 31.1 (275)<br>31.1 (275)            | 5/16" Hex<br>3/8" Hex |
| <b>AC Input to MIS from UPS</b>       | MIS-1                        | Phase A         | 1 – 2/0–250 kcmil<br>1 – 2/0–500 kcmil | 31.1 (275)<br>31.1 (275)            | 5/16" Hex<br>3/8" Hex |
|                                       | MIS-3                        | Phase B         | 1 – 2/0–250 kcmil<br>1 – 2/0–500 kcmil | 31.1 (275)<br>31.1 (275)            | 5/16" Hex<br>3/8" Hex |
|                                       | MIS-5                        | Phase C         | 1 – 2/0–250 kcmil<br>1 – 2/0–500 kcmil | 31.1 (275)<br>31.1 (275)            | 5/16" Hex<br>3/8" Hex |
| <b>AC Output to Critical Load</b>     | CB30-1 (E9)<br>CB31-1 (E13)  | Phase A         | 1 – #4–350 kcmil                       | 20.3 (180)                          | 3/16" Hex             |
|                                       | CB30-3 (E10)<br>CB31-3 (E14) | Phase B         | 1 – #4–350 kcmil                       | 20.3 (180)                          | 3/16" Hex             |
|                                       | CB30-5 (E11)<br>CB31-5 (E15) | Phase C         | 1 – #4–350 kcmil                       | 20.3 (180)                          | 3/16" Hex             |
| <b>Neutral</b>                        | N                            | Neutral         | 8 – #2–600 kcmil                       | 56.5 (500)                          | 1/2" Hex              |
| <b>Ground</b>                         | Gnd                          | Ground          | 6 – #14–1/0                            | 5.6 (50)                            | Slotted               |

- 10. External IAC bypass input overcurrent protection is not provided by this product, but is required by codes. Refer to Table D for wiring requirements.
- 11. Table F lists the maximum rating for bypass input circuit breakers.

| <i>IAC Model</i> | <i>Input Voltage Rating</i> |             |
|------------------|-----------------------------|-------------|
|                  |                             | <i>480V</i> |
| 160 kVA          | 80% Rated                   | 300A        |
|                  | 100% Rated                  | 250A        |

**CAUTION**



To reduce the risk of fire, connect only to a circuit provided with maximum input circuit breaker current ratings from Table F in accordance with the NEC, ANSI/NFPA 70.

|  |                      |
|--|----------------------|
| <i>DESCRIPTION:</i> <b>POWER WIRING INSTALLATION NOTES</b> |                      |
| <i>DRAWING NO.:</i> 164201627-4                            | <i>SHEET:</i> 3 of 4 |
| <i>REVISION:</i> A   | <i>DATE:</i> 011506  |

12. The MIS, CB30, and CB31 breakers are adjustable trip breakers and are set to maximum at the factory. During installation these breakers must be adjusted for the site requirements using the dial on each breaker.
13. The continuous current (Ir) values for the corresponding lettered adjustment setting marked on the MIS breaker for the 400A trip sensor are listed in Table G. The continuous current (Ir) values for the corresponding lettered adjustment setting marked on the MIS, CB30, and CB31 breakers for the 250A trip sensor are listed in Table H. The continuous current (Ir) values for the corresponding lettered adjustment setting marked on the CB30 and CB31 breakers for the 100A trip sensor are listed in Table I.

| <i>Breaker Setting</i> | <i>Continuous Current (Ir)</i> | <i>Breaker Setting</i> | <i>Continuous Current (Ir)</i> |
|------------------------|--------------------------------|------------------------|--------------------------------|
| A                      | 250                            | —                      | —                              |
| B                      | 300                            | —                      | —                              |
| C                      | 350                            | —                      | —                              |
| D                      | 400                            | —                      | —                              |

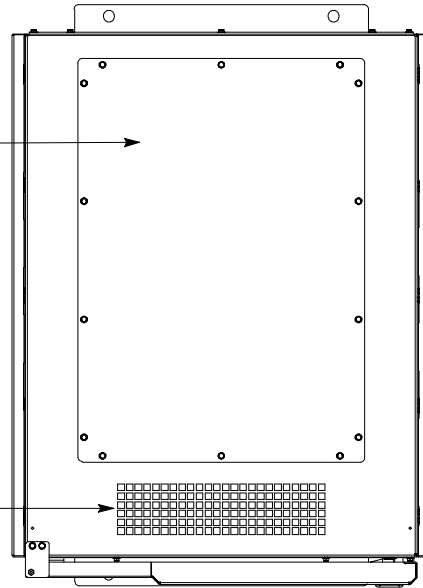
| <i>Breaker Setting</i> | <i>Continuous Current (Ir)</i> | <i>Breaker Setting</i> | <i>Continuous Current (Ir)</i> |
|------------------------|--------------------------------|------------------------|--------------------------------|
| A                      | 100                            | E                      | 175                            |
| B                      | 125                            | F                      | 200                            |
| C                      | 150                            | G                      | 225                            |
| D                      | 160                            | H                      | 250                            |

| <i>Breaker Setting</i> | <i>Continuous Current (Ir)</i> | <i>Breaker Setting</i> | <i>Continuous Current (Ir)</i> |
|------------------------|--------------------------------|------------------------|--------------------------------|
| A                      | 40                             | E                      | 70                             |
| B                      | 45                             | F                      | 80                             |
| C                      | 50                             | G                      | 90                             |
| D                      | 63                             | H                      | 100                            |

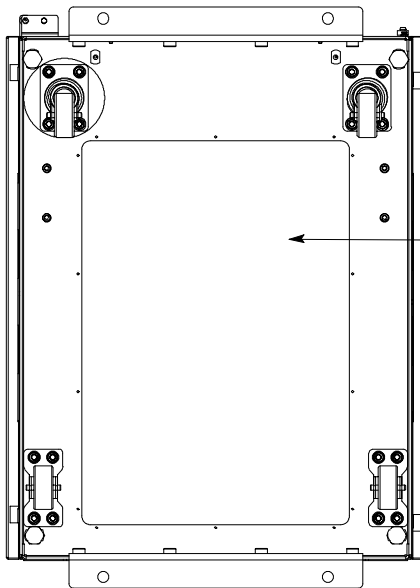
|  |                      |
|--|----------------------|
| <i>DESCRIPTION:</i> <b>POWER WIRING INSTALLATION NOTES</b> |                      |
| <i>DRAWING NO.:</i> 164201627-4                            | <i>SHEET:</i> 4 of 4 |
| <i>REVISION:</i> A   | <i>DATE:</i> 011506  |

TOP ENTRY CONDUIT LANDING PLATE FOR AC INPUT, AC OUTPUT, AND INTERFACE CONNECTIONS. (REMOVE PANEL TO DRILL OR PUNCH CONDUIT HOLES.)

REMOVE DEBRIS SHIELD COVERING EXHAUST GRILL BEFORE OPERATING SYSTEM.



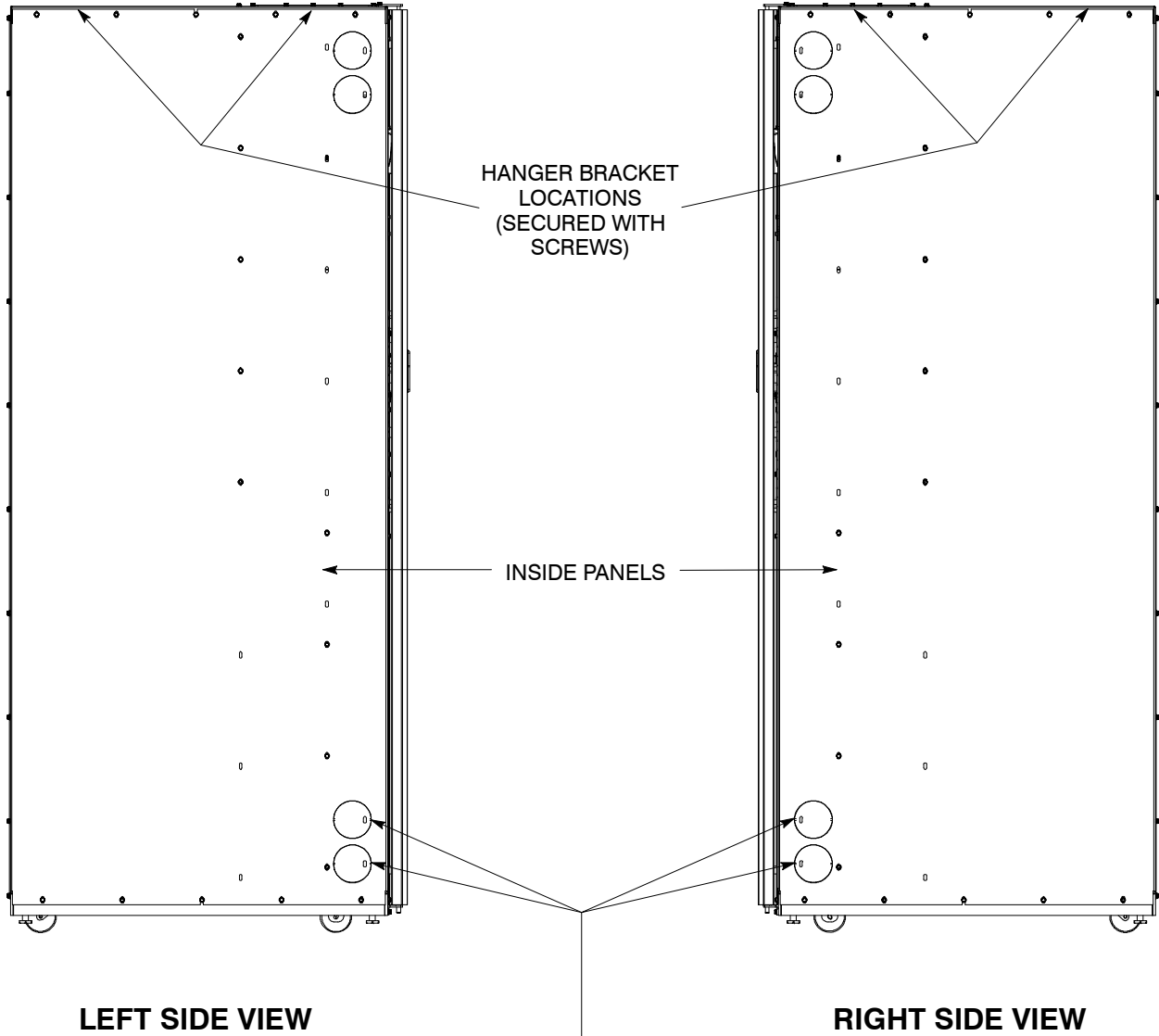
**TOP VIEW**



BOTTOM ENTRY CONDUIT LANDING PLATE FOR AC INPUT, AC OUTPUT, AND INTERFACE CONNECTIONS. (REMOVE PANEL TO DRILL OR PUNCH CONDUIT HOLES.)

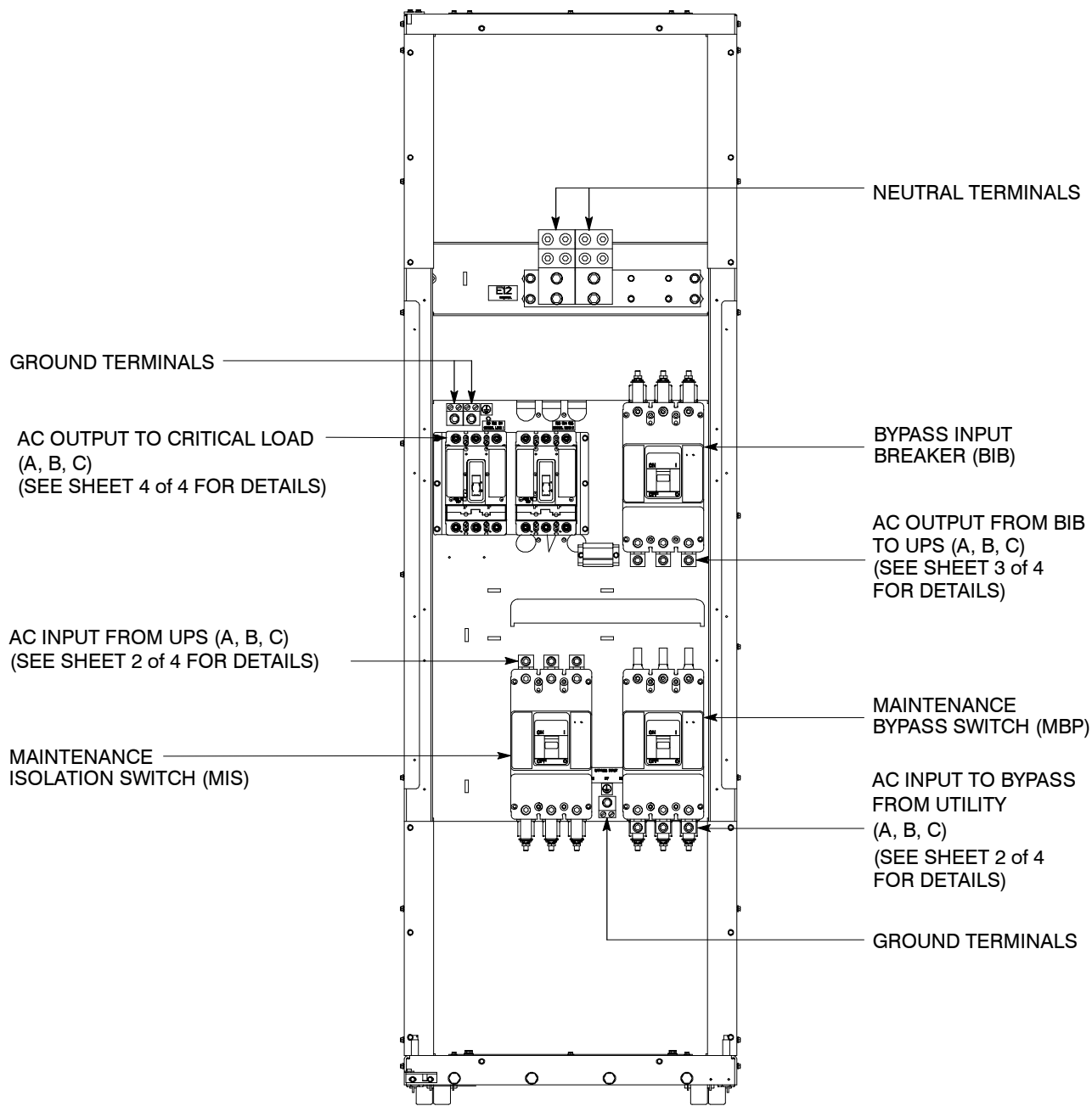
**BOTTOM VIEW**

|   |                      |  |
|---|----------------------|--|
| <i>DESCRIPTION:</i> <b>CONDUIT AND WIRE ENTRY LOCATIONS</b> |                      |  |
| <i>DRAWING NO:</i> 164201627-5                              | <i>SHEET:</i> 1 of 2 |  |
| <i>REVISION:</i> A  | <i>DATE:</i> 011506  |  |



INTER-CABINET WIRING ACCESS KNOCKOUTS.  
REMOVE KNOCKOUTS, AS REQUIRED, TO  
ROUTE WIRES BETWEEN CABINETS. (INSTALL  
NYLON GROMMET AFTER REMOVAL OF  
KNOCKOUTS.)

|  |               |
|--|---------------|
| DESCRIPTION: <b>CONDUIT AND WIRE ENTRY LOCATIONS</b> |               |
| DRAWING NO: 164201627-5                              | SHEET: 2 of 2 |
| REVISION: A  | DATE: 011506  |

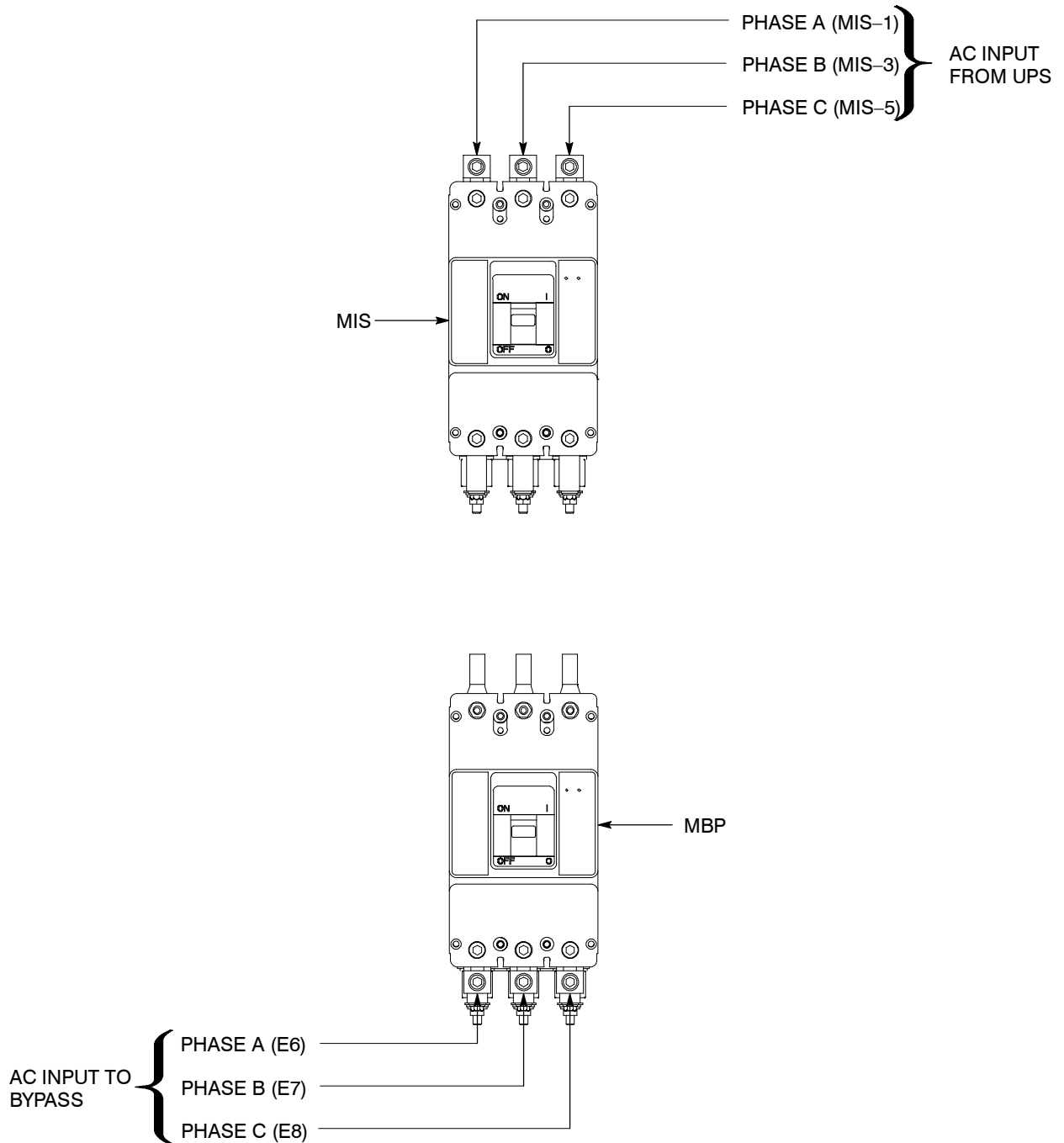


**160 kVA 480V/480V  
MAINTENANCE BYPASS WITH BIB, CB30, and CB31**

**NOTE:** Metal shields covering wiring terminals must be removed to gain access to terminals.

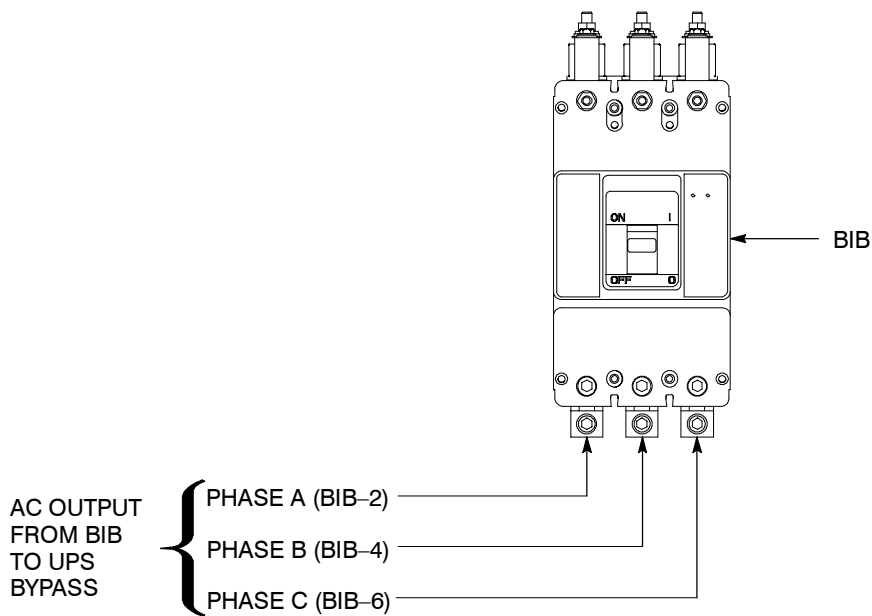
|  |               |
|--|---------------|
| DESCRIPTION: <b>IAC POWER TERMINAL LOCATIONS</b> |               |
| DRAWING NO: 164201627-6                          | SHEET: 1 of 4 |
| REVISION: A                                      | DATE: 011506  |

### MIS AND MBP TERMINAL DETAIL



|  |               |
|--|---------------|
| DESCRIPTION: <b>IAC POWER TERMINAL LOCATIONS</b> |               |
| DRAWING NO: 164201627-6                          | SHEET: 2 of 4 |
| REVISION: A                                      | DATE: 011506  |

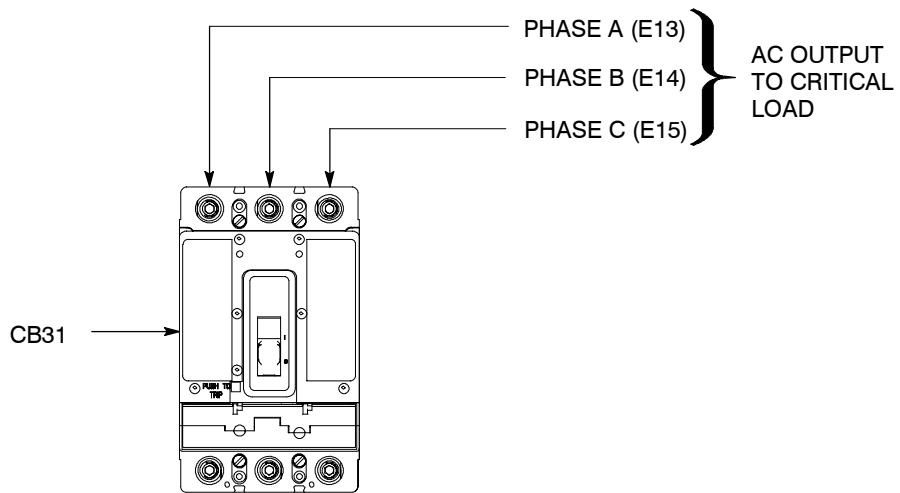
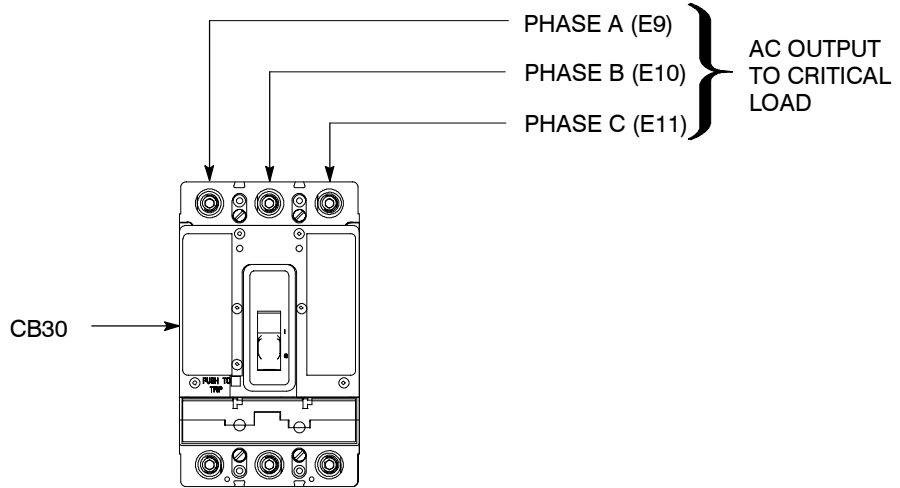
## BIB TERMINAL DETAIL



|   |                      |
|---|----------------------|
| <i>DESCRIPTION:</i> <b>IAC POWER TERMINAL LOCATIONS</b> |                      |
| <i>DRAWING NO:</i> 164201627-6                          | <i>SHEET:</i> 3 of 4 |
| <i>REVISION:</i> A                                      | <i>DATE:</i> 011506  |



## CB30 AND CB31 TERMINAL DETAIL



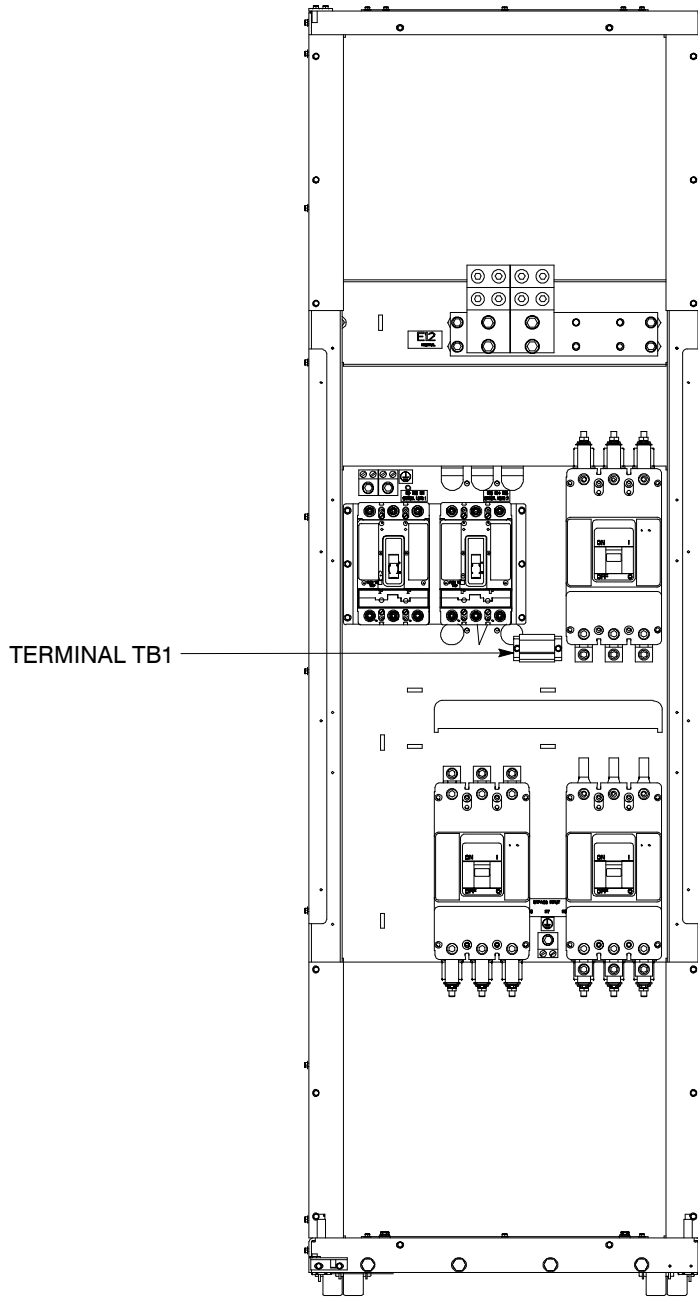
|  |               |
|--|---------------|
| DESCRIPTION: <b>IAC POWER TERMINAL LOCATIONS</b> |               |
| DRAWING NO: 164201627-6                          | SHEET: 4 of 4 |
| REVISION: A                                      | DATE: 011506  |

1. Use Class 1 wiring methods (as defined by the NEC) for control wiring. The wire should be rated at 600 volts, 1A minimum and 12 AWG maximum. Use twisted-pair wires for each input and common. All control wiring is customer-provided.
2. When installing aux contact control wiring to the IAC interface terminals for standalone installations, conduit must be installed between the UPS cabinet and the IAC. Install the control wiring in separate conduit from the power wiring.
3. Alarms display as Building Alarm 1 and Building Alarm 2 on the UPS Control Panel Display Screen, unless the alarms are programmed to display the alarm functional name.
4. Refer to Table J, the following sheets of this drawing, and to Chapter 3 for customer interface and control wiring.

| IAC Terminal TB1 | Name                   | Description  |
|------------------|------------------------|--|
| 1                | MBP Aux Contact NO     | Contacts used to indicate whether IAC MBP is closed. Contacts are closed when MBP is closed. |
| 2                | MBP Aux Contact Return |  |
| 3                | Not Used               |  |
| 4                | Not Used               |  |
| 5                | Not Used               |  |
| 6                | Not Used               |  |
| 7                | Not Used               |  |
| 8                | Not Used               |  |
| 9                | Not Used               |  |
| 10               | Not Used               |  |

|  |                      |  |
|--|----------------------|--|
| <b>DESCRIPTION: INTERFACE AND CONTROL WIRING<br/>INSTALLATION NOTES AND<br/>TERMINAL LOCATIONS</b> |                      |  |
| <b>DRAWING NO:</b> 164201627-7   | <b>SHEET:</b> 1 of 4 |  |
| <b>REVISION:</b> A   | <b>DATE:</b> 011506  |  |

## TERMINAL LOCATIONS



TERMINAL TB1

**NOTE:** Metal shields covering wiring terminals must be removed or opened to gain access to terminals.

DESCRIPTION: **INTERFACE AND CONTROL WIRING  
INSTALLATION NOTES AND  
TERMINAL LOCATIONS**

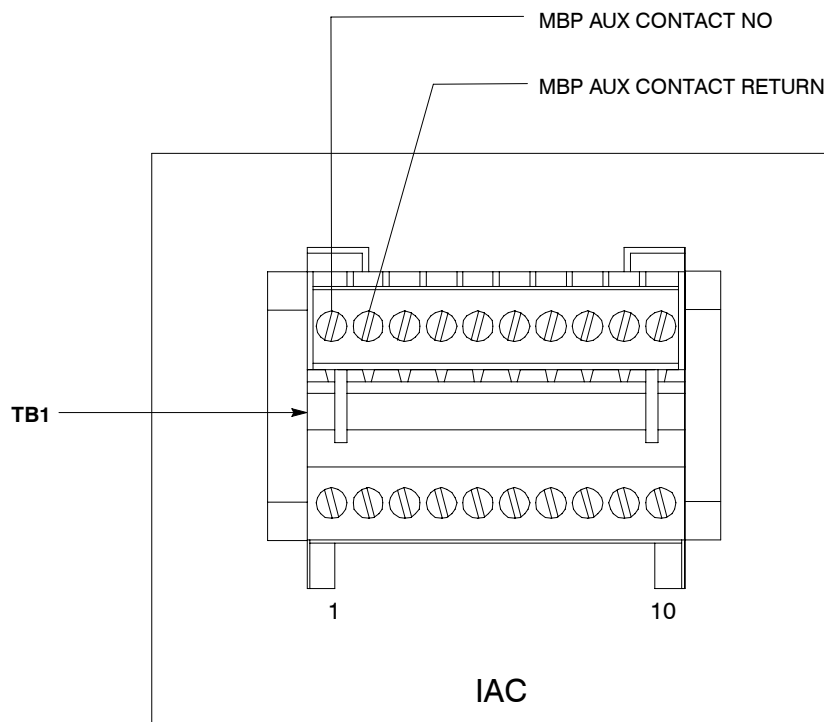
DRAWING NO: 164201627-7

SHEET: 2 of 4

REVISION: A

DATE: 011506

### TERMINAL TB1



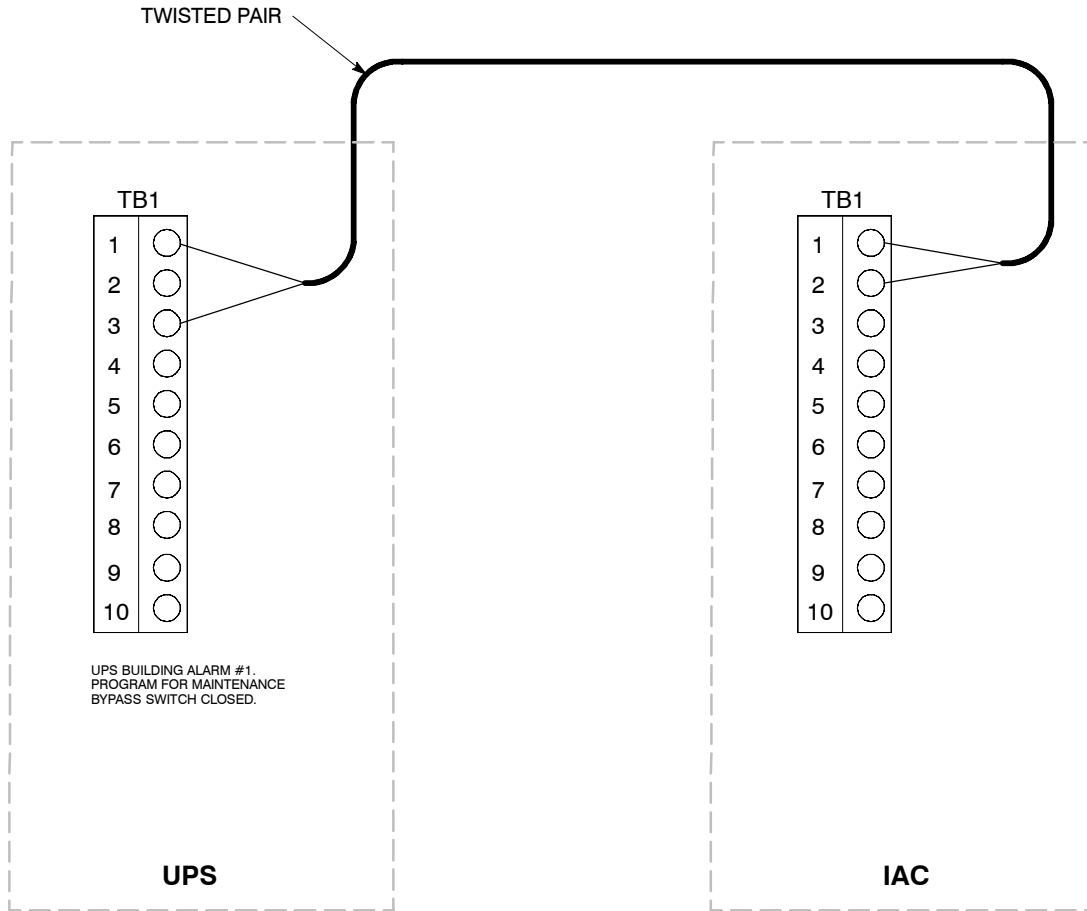
**NOTE:** 1. Alarms display as Building Alarm 1 and Building Alarm 2 on the UPS Control Panel Display Screen, unless the alarms are programmed to display the alarm functional name.

2. Use twisted-pair wires for each alarm input and common.

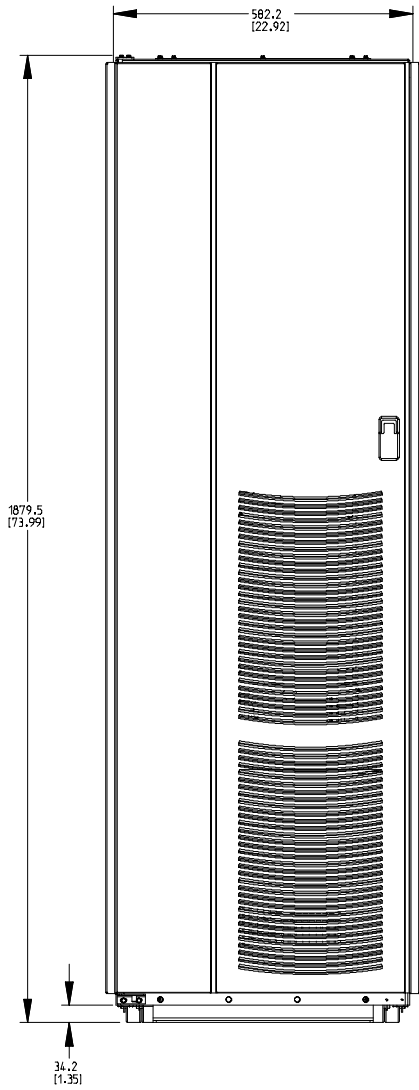
|              |   |               |
|--------------|---|---------------|
| DESCRIPTION: | <b>INTERFACE AND CONTROL WIRING<br/>INSTALLATION NOTES AND<br/>TERMINAL LOCATIONS</b> |               |
| DRAWING NO:  | 164201627-7   | SHEET: 3 of 4 |
| REVISION:    | A   | DATE: 011506  |

## MAINTENANCE BYPASS MONITORING WIRING

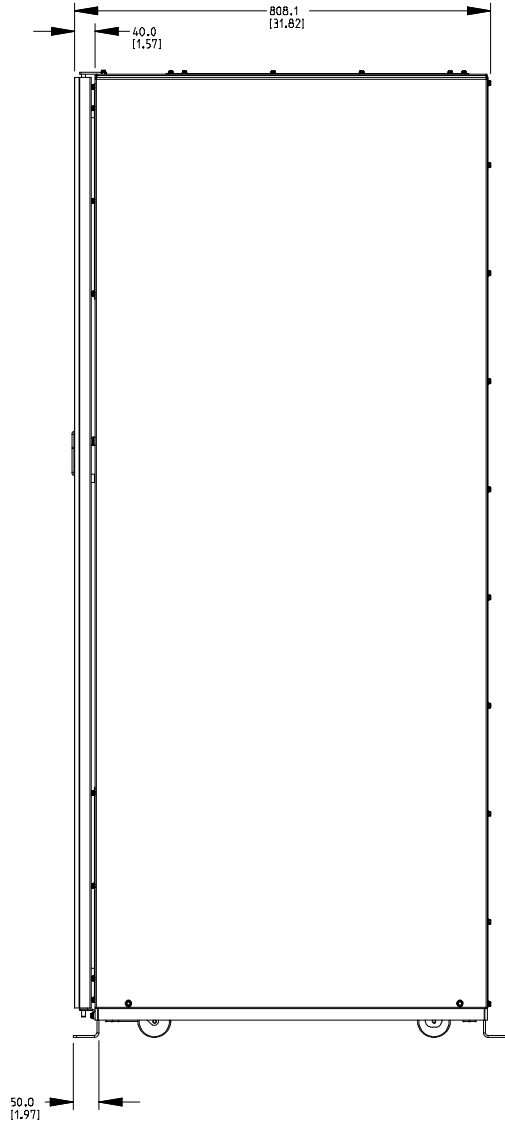
| Maintenance Bypass Monitoring Wiring Terminations |                         |
|---|-------------------------|
| From  | To                      |
| UPS TB1-2 (Build Alm 1)                           | IAC TB1-1 (MBP Aux NO)  |
| UPS TB1-3 (Build Alm Com)                         | IAC TB1-2 (MBP Aux Com) |



|                     |   |                      |
|---------------------|---|----------------------|
| <i>DESCRIPTION:</i> | <b>INTERFACE AND CONTROL WIRING<br/>INSTALLATION NOTES AND<br/>TERMINAL LOCATIONS</b> |                      |
| <i>DRAWING NO.:</i> | 164201627-7   | <i>SHEET:</i> 4 of 4 |
| <i>REVISION:</i>    | A   | <i>DATE:</i> 011506  |



**FRONT VIEW**

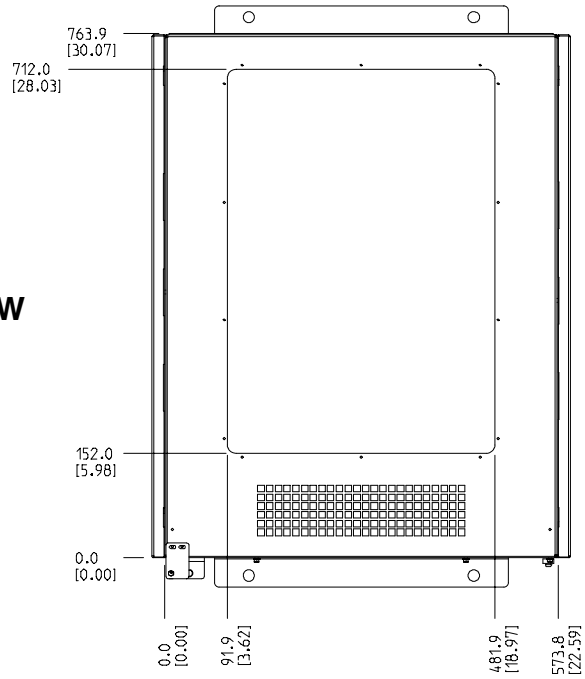


**RIGHT SIDE VIEW**

Dimensions are in millimeters [inches]

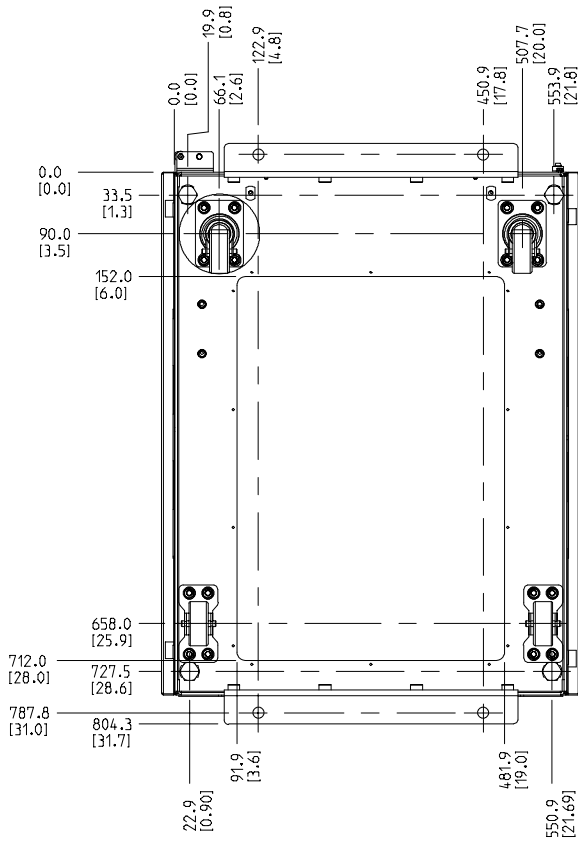
|                                    |                      |
|------------------------------------|----------------------|
| <b>DESCRIPTION:</b> IAC DIMENSIONS |                      |
| <b>DRAWING NO:</b> 164201627-8     | <b>SHEET:</b> 1 of 2 |
| <b>REVISION:</b> A                 | <b>DATE:</b> 011506  |

**TOP VIEW**



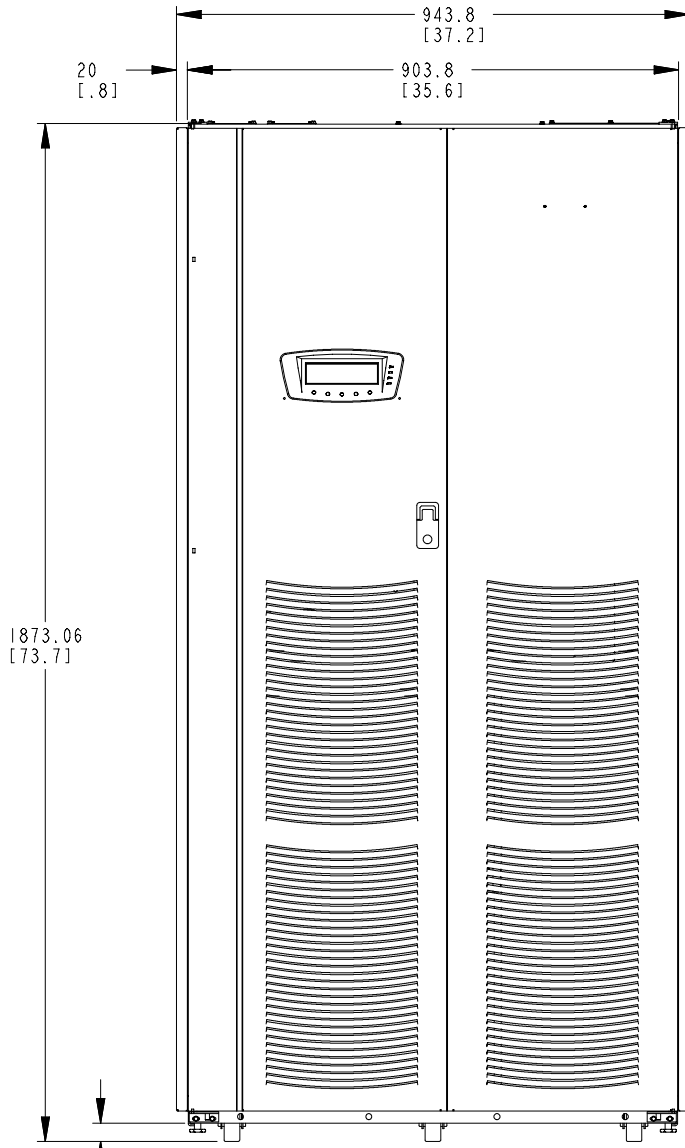
**BOTTOM VIEW**

(OPTIONAL FLOOR MOUNTING SHOWN)

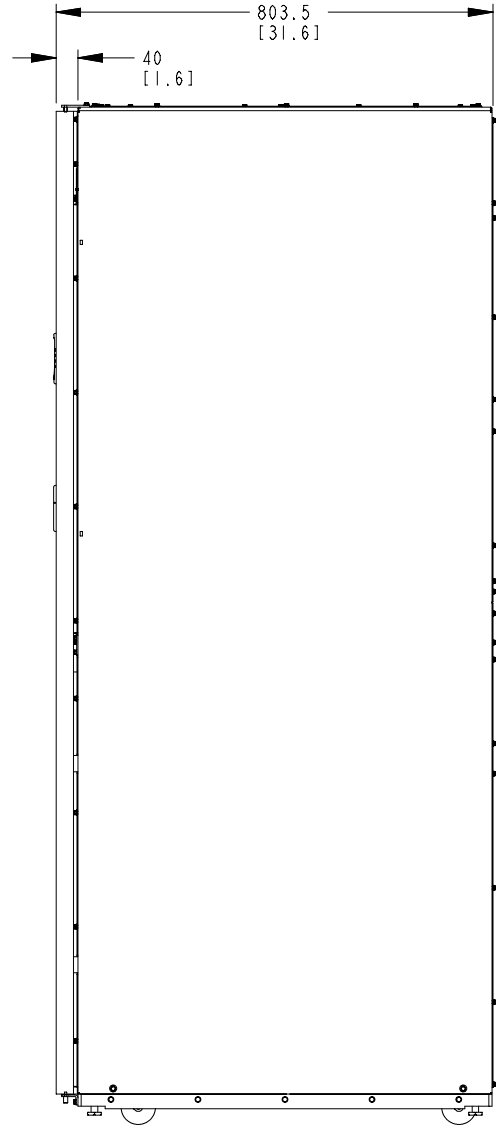


Dimensions are in millimeters [inches]

|                                    |               |
|------------------------------------|---------------|
| DESCRIPTION: <b>IAC DIMENSIONS</b> |               |
| DRAWING NO: 164201627-8            | SHEET: 2 of 2 |
| REVISION: A                        | DATE: 011506  |



**FRONT VIEW**

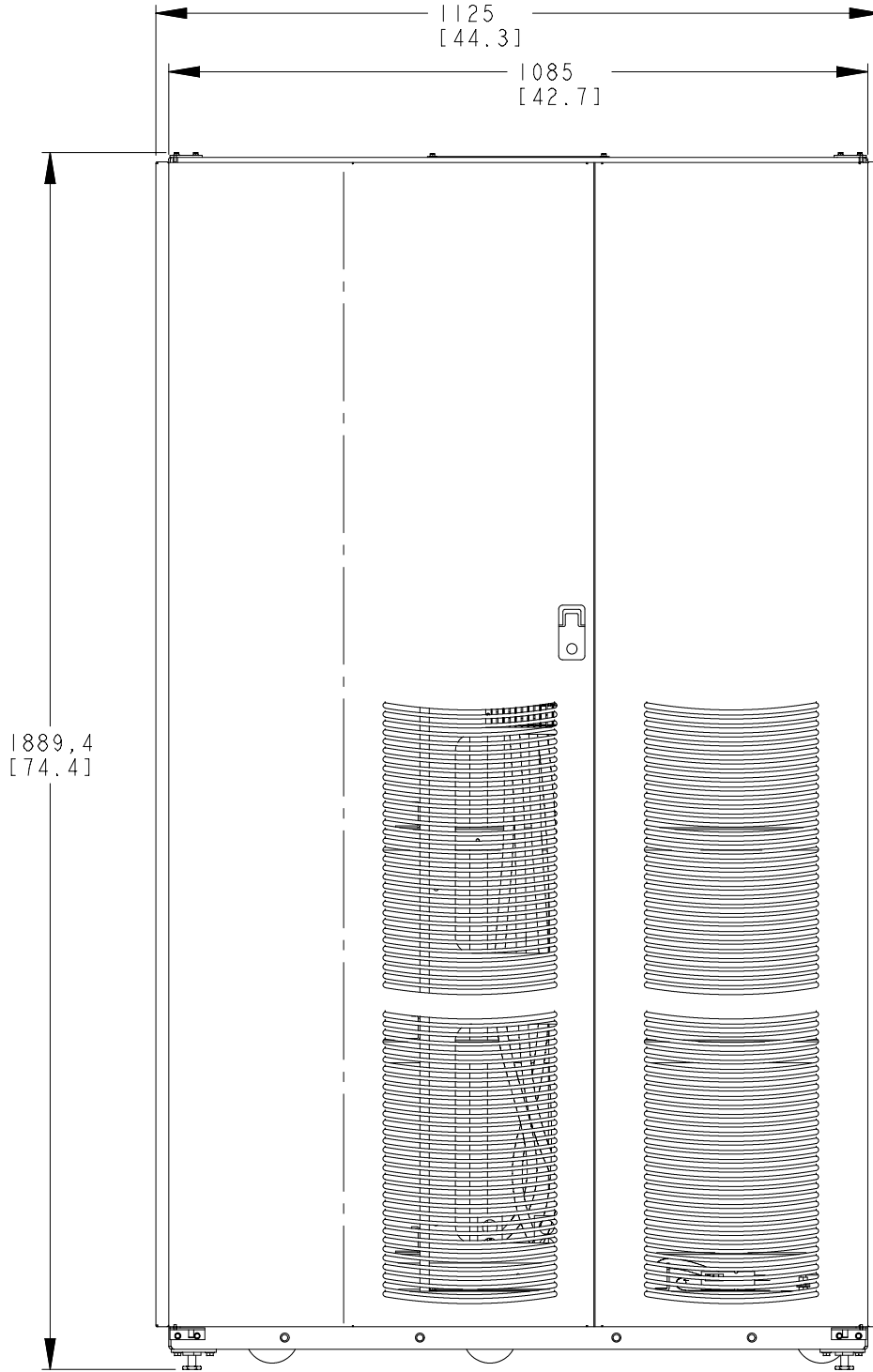


**RIGHT SIDE VIEW**

Dimensions are in millimeters [inches]

|  |                      |
|--|----------------------|
| <b>DESCRIPTION:</b> UPS CABINET DIMENSIONS |                      |
| <b>DRAWING NO:</b> 164201604-9             | <b>SHEET:</b> 1 of 4 |
| <b>REVISION:</b> A                         | <b>DATE:</b> 091505  |





**FRONT VIEW**

**MODEL IBC-L**

|              |             |                                   |        |
|--------------|-------------|-----------------------------------|--------|
| DESCRIPTION: |             | <b>BATTERY CABINET DIMENSIONS</b> |        |
| DRAWING NO:  | 164201536-9 | SHEET:                            | 3 of 5 |
| REVISION:    | B           | DATE:                             | 091504 |

Dimensions are in millimeters [inches]