

# H7245 Utility Port Conditioner

---

## Site Preparation and Installation Information

Order Number: EK-A0533-IN.001

**July, 1991**

This publication describes the site preparation and installation of the H7245 Utility Port Conditioner (UPC) for all models of the VAX 9000 family of computers.

**Revision/Update Information:** This is a new manual.

**Digital Equipment Corporation  
Maynard, Massachusetts**

---

**July 1991**

The information in this document is subject to change without notice and should not be construed as a commitment by Digital Equipment Corporation. Digital Equipment Corporation assumes no responsibility for any errors that may appear in this document.

No responsibility is assumed for the use or reliability of software on equipment that is not supplied by Digital Equipment Corporation or its affiliated companies.

Restricted Rights: Use, duplication, or disclosure by the U.S. Government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.227-7013.

© Digital Equipment Corporation 1991.

All Rights Reserved.

The following are trademarks of Digital Equipment Corporation:  
VAX, VAX 9000, IOA and the DIGITAL logo.

This document was prepared using VAX DOCUMENT, Version 2.0.

---

# Contents

<b>Preface</b> .....	vii
<b>1 Preparing a Site for the UPC</b>	
1.1 Introduction to the H7245 Utility Port Conditioner .....	1-1
1.1.1 Floor Space and Environmental Specifications .....	1-3
1.1.2 Physical Specifications .....	1-3
1.1.3 Operating and Storage Environment .....	1-4
1.2 Electrical Specifications .....	1-4
1.2.1 Power Distribution .....	1-5
1.2.2 Grounding .....	1-20
<b>2 Unpacking and Inspecting UPC Kit Contents</b>	
2.1 Hazard and Safety Considerations .....	2-1
2.1.1 Electrostatic Discharge .....	2-1
2.1.2 FCC Compliance .....	2-2
2.1.3 Safety Precautions .....	2-2
2.2 Unpacking and Inspection .....	2-2
2.3 Unpacking the UPC .....	2-3
<b>3 UPC Cable Installation</b>	
3.1 Cabling Considerations .....	3-1
3.2 Connecting the dc Cable .....	3-2
3.2.1 Connecting the dc Output Cable to VAX 9000 Model 200 Configurations .....	3-6
3.2.2 Connecting the dc Output Cable to VAX 9000 Model 400 Configurations .....	3-7
3.3 Connecting the ac Output Cable .....	3-7
3.4 Connecting the Signal Cable .....	3-7
<b>4 Powering Up the UPC</b>	
4.1 Safety Guidelines .....	4-1
4.2 Before Applying Power to the UPC .....	4-2
4.2.1 Operator Control Panel Setup .....	4-4
4.3 The Power Up Sequence .....	4-5

## A Recommended Precautions Against Electrical Accidents

A.1	Body Damage Caused by Electrical Current . . . . .	A-1
-----	--	-----

## B Lockout and Tagout Procedures

### Glossary

### Index

### Figures

1-1	UPC Cabinet Dimensions . . . . .	1-3
2-1	Removing Packing Material . . . . .	2-4
2-2	Removing Shipping Brackets . . . . .	2-5
2-3	Unloading the UPC from the Pallet . . . . .	2-6
2-4	Adjusting the Leveling Feet . . . . .	2-7
3-1	Rear of the UPC . . . . .	3-2
3-2	Removing the High-Voltage Chamber Rear Cover . . . . .	3-3
3-3	Connecting the dc Cable . . . . .	3-4
3-4	Installing UPC Cables . . . . .	3-6
4-1	UPC ac Circuit Breaker Assembly . . . . .	4-3
4-2	UPC Indicators . . . . .	4-4
B-1	Locking Clip Fitted to Main ac Input Circuit Breaker Q1. . . . .	B-2

### Tables

1	Conventions . . . . .	viii
1-1	VAX 9000 System Configurations . . . . .	1-2
1-2	Physical Specifications . . . . .	1-4
1-3	Environmental Specifications . . . . .	1-4
1-4	Electrical Output Power Specifications . . . . .	1-6
1-5	VAX 9000 Model 110 and Model 110VP with UPC: ac Input Power Requirements . . . . .	1-7
1-6	VAX 9000 Model 210 and Model 210VP with UPC: ac Input Power Requirements . . . . .	1-8
1-7	VAX 9000 Model 310 and Model 310VP with UPC: ac Input Power Requirements . . . . .	1-9
1-8	Model 320 and Model 320VP with UPC: ac Input Power Requirements . . . . .	1-10
1-9	VAX 9000 Model 330 and Model 330VP with UPC A: ac Input Power Requirements . . . . .	1-11
1-10	VAX 9000 Model 330 and Model 330VP with UPC B: ac Input Power Requirements . . . . .	1-12
1-11	Steady-State kVA and rms Current for One-Side Powering of VAX 9000 Model 330 and Model 330VP with UPC . . . . .	1-12
1-12	Steady-State kVA and rms Current for One-Side Powering of VAX 9000 Model 340 and Model 340VP with UPC . . . . .	1-13

1-13	VAX 9000 Model 340 and Model 340VP with UPC A: ac Input Power Requirements . . . . .	1-13
1-14	VAX 9000 Model 340 and Model 340VP with UPC B: ac Input Power Requirements . . . . .	1-14
1-15	VAX 9000 Model 410 and Model 410VP with UPC: ac Input Power Requirements . . . . .	1-15
1-16	VAX 9000 Model 420 and Model 420VP with UPC: ac Input Power Requirements . . . . .	1-16
1-17	VAX 9000 Model 430 and Model 430VP with UPC A: ac Input Power Requirements . . . . .	1-17
1-18	VAX 9000 Model 430 and Model 430VP with UPC B: ac Input Power Requirements . . . . .	1-18
1-19	Steady-State kVA and rms Current for One-Side Powering of VAX 9000 Model 430 and Model 430VP with UPC . . . . .	1-18
1-20	Steady-State kVA and rms Current for One-Side Powering of VAX 9000 Model 440 and Model 440VP with UPC . . . . .	1-19
1-21	VAX 9000 Model 440 and Model 440VP with UPC A: ac Input Power Requirements . . . . .	1-19
1-22	VAX 9000 Model 440 and Model 440VP with UPC B: ac Input Power Requirements . . . . .	1-20
2-1	Tools and Resources . . . . .	2-3
3-1	UPC Output and Control Cables . . . . .	3-2
3-2	VAX 9000 Model 200 dc Cable Connections . . . . .	3-5
3-3	VAX 9000 Model 400 dc Cable Connections . . . . .	3-5
4-1	Power Up LEDs . . . . .	4-6
A-1	Effects of Current on the Human Body . . . . .	A-1

---

# Preface

## Purpose of This Manual

This manual describes the site preparation and installation of the **H7245 Utility Port Conditioner (UPC)**, for all models of the VAX 9000 family of computer systems.

## Intended Audience

This manual is for readers who are familiar with the VAX 9000 family of computer systems. The information is for use by the following personnel:

- Digital Site Preparation Engineers who are responsible for preparing customer sites prior to installing computer systems of the VAX 9000 family.
- Digital Installation Engineers who are responsible for installing the VAX 9000 family of computer systems.

## Scope and Structure of this Manual

This manual describes only the differences between the H7245 UPC and the H7392 UPC. All information about the H7392 UPC provided in the *VAX 9000 Family Site Preparation Guide* holds true for the H7245 UPC except where it is superseded by information in this guide. This guide is divided into four chapters as follows:

- Chapter 1 briefly introduces the H7245 UPC, and describes the salient requirements for preparing a site for UPC installation. The chapter contains lists of all the requirements, parameters, and characteristics that are specific to the H7245 site preparation. This information is different from site preparation details provided in the *VAX 9000 System Site Preparation and Planning Guide*.
- Chapter 2 describes unpacking and inspecting the UPC kit contents. The chapter also includes general information on electrostatic discharge, FCC compliance, and safety precautions and warnings.
- Chapter 3 describes UPC cable installation.
- Chapter 4 lists pre-power up checks and safety warnings and the power up sequence.

There are two appendixes as follows:

- Appendix A lists recommended safety precautions against electrical accidents.
- Appendix B lists the UPC **lockout** and **tagout** procedures.

This manual also contains a glossary and an index.

## Associated Documents

The following publication provides information about maintaining the UPC:

*H7245 Utility Port Conditioner Maintenance Information*, EK-A0534-MG

The following publications provide additional information about the VAX 9000 family of computer systems:

*VAX 9000 Model 200 Systems Installation Guide*, EK-9200I-IN

*VAX 9000 Model 400 Systems Installation Guide*, EK-9400I-IN

*VAX 9000 Family Maintenance Guide, Volume 1*, EK-KA901-MG

*VAX 9000 Family Maintenance Guide, Volume 2*, EK-KA902-MG

*VAX 9000 Family Maintenance Guide, Volume 3*, EK-KA903-MG

*VAX 9000 Family Maintenance Guide, Volume 4*, EK-KA904-MG

*VAX 9000 Family Maintenance Documentation Kit*, EK-KA900-MG

*VAX 9000 Family SPU Technical Description*, EK-KA90C-TD

*VAX 9000 Family EBOX Technical Description*, EK-KA90E-TD

*VAX 9000 Family IBOX Technical Description*, EK-KA90I-TD

*VAX 9000 Family MBOX Technical Description*, EK-KA90M-TD

*VAX 9000 Family VBOX Technical Description*, EK-KA90V-TD

*VAX 9000 Family SCU Technical Description*, EK-KA90J-TD

*VAX 9000 Family XJA Technical Description*, EK-KA90A-TD

*VAX 9000 Family Clock Subsystem Technical Description*, EK-KA90K-TD

*VAX 9000 Family Power System Technical Description*, EK-KA90P-TD

*VAX 9000 Family Technical Description*, EK-KA90S-TD

*VAX 9000 Family Technical Description Kit*, EK-KA900-TD

*VAX 9000 Site Preparation Guide*, EK-9000S-SP

## Conventions Used in This Manual

Table 1 lists the conventions used in this manual.

**Table 1 Conventions**

Convention	Description
<b>Bold</b>	<b>Bold</b> is used to emphasize the first occurrence of a term in text.
<i>Italics</i>	<i>Italics</i> are used to emphasize a word or phrase.
<b>NOTE</b>	A note contains information that is of special importance to the reader.
<b>CAUTION</b>	Cautions provide information to prevent damage to equipment. Read these carefully. Minor hazard can occur if you ignore cautions.
<b>WARNING</b>	Warnings contain information to prevent personal injury. Read these carefully. Severe hazard can occur if you ignore warnings.
ON and OFF	Uppercase ON and OFF serve to highlight important operations.
AC and DC, ac and dc	When these letters appear in uppercase characters, then they represent a label name on the UPC, or a signal name on one of the UPC related buses. When these letters appear in lowercase, then they represent voltage notation.

(continued on next page)

**Table 1 (Cont.) Conventions**

<b>Convention</b>	<b>Description</b>
UPC names	All names of bulkheads, components and modules within the UPC are given in lowercase, except in titles, captions and at the start of sentences.
UPPERCASE	Uppercase letters are used to emphasize important points.



---

## Preparing a Site for the UPC

This chapter contains general information about the **H7245 Utility Port Conditioner (UPC)**, and also provides site planning guidelines, space and environmental requirements, cabinet size, and power specifications. This information supersedes that given in the *VAX 9000 System Site Preparation and Planning Guide*.

---

### WARNING

---

The procedures described in this book should be performed only by trained personnel.

---

---

### ATTENTION

---

Les interventions décrites dans cet ouvrage ne doivent être effectuées que par des agents qualifiés.

---

---

### WARNUNG

---

Die in diesem Buch beschriebenen Anweisungen sollte nur von geschultem Personal ausgeführt werden.

---

---

### ATTENCION

---

Los procedimientos descritos en este libro debe ser realizado solamente por personal entrenado.

---

### 1.1 Introduction to the H7245 Utility Port Conditioner

The UPC is the power conditioner unit for the VAX 9000 family of computer systems. The UPC is a free standing unit contained in its own cabinet. The UPC converts a three-phase, **Y-connected** ac voltage, obtained from the power utility, to an isolated and regulated dc voltage of 280 V, and also to improve such power utility parameters as power factor and harmonic distortion. The UPC provides the VAX 9000 systems with an auxiliary ac source of 208 V ac to supply the **battery backup units (BBUs)** in the systems; a single phase outlet is also available within the UPC for service instrumentation.

## Preparing a Site for the UPC

### 1.1 Introduction to the H7245 Utility Port Conditioner

The UPC can power loads up to a maximum of 20 kW. Reliability features include 100 ms **ride-through capability** and **modular hardware redundancy**. Depending on the system configuration, a VAX 9000 system can use one or two UPCs. The main dc output of the UPC is routed to the IOA/IOB cabinet of the VAX 9000 system from where it is distributed to the system dc converters.

There are two different platforms in the VAX 9000 family of systems: the 210 platform and the 400 platform. The platform type forms part of the model number of the individual VAX 9000 system. Systems with vector processor capability are also indicated in the model number by the letters VP immediately following the platform type. Table 1–1 lists the possible VAX 9000 system configurations and their UPC requirements.

**Table 1–1 VAX 9000 System Configurations**

Model number	Description	Number of UPCs
<b>210 Platform</b>		
9000-110	Bounded server	1
9000-110VP		1
9000-210	Bounded uniprocessor mainframe	1
9000-210VP	Bounded uniprocessor supercomputer	1
<b>400 Platform</b>		
9000-310	A uniprocessor server	1
9000-320	A dualprocessor server	1
9000-330	A triprocessor server	2
9000-340	A quadprocessor server	2
9000-310VP	A uniprocessor server with vector	1
9000-320VP	A dualprocessor server with vector	1
9000-330VP	A triprocessor server with vector	2
9000-340VP	A quadprocessor server with vector	2
9000-410	Uniprocessor mainframe	1
9000-420	Dualprocessor mainframe	1
9000-430	Triprocessor mainframe	2
9000-440	Quadprocessor mainframe	2
9000-410VP	Uniprocessor supercomputer	1
9000-420VP	Dualprocessor supercomputer	1
9000-430VP	Triprocessor supercomputer	2
9000-440VP	Quadprocessor supercomputer	2

There are upgrade paths available between models; a second UPC is required when upgrading from any uniprocessor or dualprocessor configuration to any triprocessor or quadprocessor configuration.

# Preparing a Site for the UPC

## 1.1 Introduction to the H7245 Utility Port Conditioner

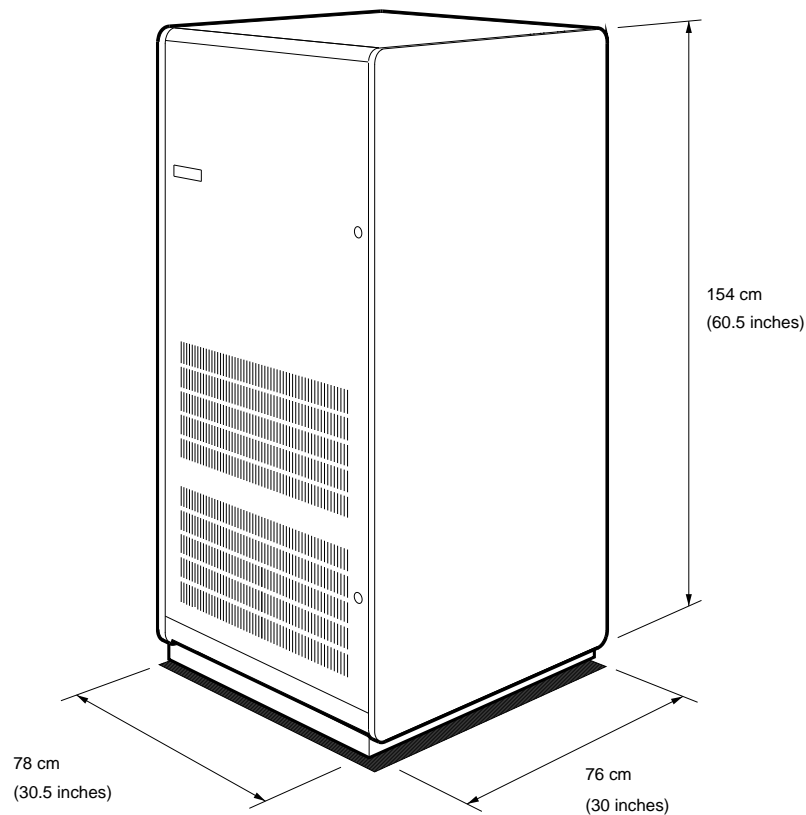
### 1.1.1 Floor Space and Environmental Specifications

The UPC requires a minimum of 121.9 cm (48.0 inches) service clearance space at the front and rear of the cabinet. The UPC connects to the remote VAX 9000 system cabinets via a set of three cables. These cable sets are offered in lengths of 3.05 m, 6.10 m, 9.15 m, 12.20 m, and 15.24 m, corresponding to 10 ft, 20 ft, 30 ft, 40 ft, and 50 ft respectively. You must not bolt the UPC to any of the other cabinets; it must stand alone. You can place the UPC at either end of the cabinet row or you can place it in a separate room. If you do place the UPC in a separate room then that room must be on the same floor as the VAX 9000 system. Always follow local electrical codes and regulations.

### 1.1.2 Physical Specifications

This section lists the physical specifications of the UPC. Figure 1–1 shows the dimensions of the UPC cabinet.

Figure 1–1 UPC Cabinet Dimensions



RE\_EN06396C\_91

## Preparing a Site for the UPC

### 1.1 Introduction to the H7245 Utility Port Conditioner

Table 1–2 lists the free standing (less shipping and packing material) weight and dimensions of the UPC.

**Table 1–2 Physical Specifications**

Parameter	Specifications
Height	154 cm (60.5 in)
Width	78 cm (30.5 in)
Depth	76 cm (30 in)
Unit Weight <sup>1</sup>	425 kg (935 lb)

<sup>1</sup>Four leveler feet support the weight of the cabinet. Each foot measures 11.40 cm<sup>2</sup> (1.76 in<sup>2</sup>)

#### 1.1.3 Operating and Storage Environment

The UPC operates in a Digital Class A environment, Table 1–3 contains the recommended limits within the Class A environment that provide the maximum efficiency and reliability for the UPC.

**Table 1–3 Environmental Specifications**

Parameter	Specifications
<b>Operating</b>	
Temperature	15°C-32°C (59°F-90°F)
Relative humidity	20-80%
Maximum wet bulb temperature	20°C (77°F)
Minimum dew point	2°C (36°F)
Altitude	2.4 km (8000 ft)
Maximum temperature rate of change	11°C (20°F) per hour
<b>Nonoperating</b>	
Low temperature limit	-40°C (-40°F)
Relative humidity (low temperature)	50%
High temperature limit	66°C (151°F)
Relative humidity (high temperature)	95%
Maximum wet bulb temperature	25°C (77°F)
Altitude	4.8 km (16 000 ft)
Minimum dew point	2°C (36°F)

For more information see the *VAX 9000 System Site Preparation and Planning Guide*.

## 1.2 Electrical Specifications

This section lists the electrical specifications for the UPC and also the ac input power requirements for all the different VAX 9000 systems.

### 1.2.1 Power Distribution

The UPC converts utility ac input power to dc output power for distribution through cables to the VAX 9000 system cabinets. The UPC must receive power through a single dedicated receptacle protected either by a separate four-pole circuit breaker, or by an isolation switch. Table 1–5 to Table 1–22 give the recommended values for the circuit breaker. These circuit breakers and isolation switches must be fitted with lockout protection devices. You must not connect any other equipment or loads to the UPC supply circuit.

---

**WARNING**

---

The ac supply socket for the UPC must be adjacent to the UPC and must be easily accessible.

---

---

**ATTENTION**

---

La prise de courant alternatif alimentant l'UPC devra être contiguë à l'UPC et sera aisément accessible.

---

---

**WARNUNG**

---

Die Wechselstromversorgungssteckdose für den UPC soll sich in unmittelbarer Nähe des UPCs befinden und leicht zugänglich sein.

---

---

**ATTENCION**

---

La toma de corriente alterna para el UPC debe colocarse adyacente al mismo y debe ser fácilmente accesible.

---

You must ensure that the utility power supply is adequate to handle the original system installation, and also has enough reserve capacity for future equipment expansion. Always follow local electrical codes and regulations.

The UPC is available in one configuration for the following nominal operating sources. This configuration is the H7245-AA, nominal voltage 380/415 V rms, 50 Hz:

- 380 V rms nominal line-to-line: 303 to 418 V rms, three-phase Y-connected, five-wire at 55 A rms maximum.
- 415 V rms nominal line-to-line: 327 to 457 V rms, three-phase Y-connected, five-wire at 51 A rms maximum.

---

**NOTE**

---

Connectors supplied with the system are HD 196 SI compliant. Removal or substitution of the line cord or plug invalidates the UPC system certification.

---

## Preparing a Site for the UPC

### 1.2 Electrical Specifications

Table 1–4 lists the major electrical specifications, and Table 1–5 to Table 1–22 list the electrical requirements, for all the different VAX 9000 family systems with a UPC.

**Table 1–4 Electrical Output Power Specifications**

<b>Parameter</b>	<b>Specification</b>
Output voltage	280 V dc (at 35 A output current)
Output voltage deviation	±14 V dc
Minimum power factor	0.99 at full load (leading)
Rated dc power output	20 kW
Minimum efficiency	90%
Maximum harmonic distortion	5%
Auxiliary ac output J2 current	6 A
Auxiliary ac output J2 voltage	208 V ac
Line disturbance monitor socket J11	1 A max
Instrumentation socket J12 current	6 A max
Instrumentation socket J12 voltage	240 V ac

**Table 1–5 VAX 9000 Model 110 and Model 110VP with UPC: ac Input Power Requirements**

<b>Parameter Voltage/Frequency/Power</b>	<b>Value</b>
Voltage	380/415 V ac
Frequency	50 Hz
Phase	three-phase Y-connected (five-wire)
Power factor	0.99
Kilovolt Ampere rating	
Typical	12.6 kVA
Maximum	15.7 kVA
Current distortion factor	5%
<b>Steady-state rms current</b>	
Phase A	
Typical	19 A
Maximum	24 A
Phase B	
Typical	19 A
Maximum	24 A
Phase C	
Typical	19 A
Maximum	24 A
<b>Hardware</b>	
Recommended external circuit breaker rating <sup>1</sup>	63 A, type 3 or 4 according to IEC 947-2
Plug rating	63 A
Receptacle rating	63 A
Connector rating	63 A
Input cable length	4.57 m (15 ft)
Wires	5
Power plug IEC 309	PH-12-32963-01 Mennekes part number 1114 (63 A)
Power receptacle IEC 309	PH-12-32964-01 Mennekes part number 1128(63 A)
Connector (female on a cable)	PH-12-32962-01 Mennekes part number 1121

<sup>1</sup>Molded magnetic circuit breaker, four-pole, type 3 or 4 according to IEC 947-2, rating 63 A, 660 V ac. Must be a locking type to facilitate lockoff.

## Preparing a Site for the UPC

### 1.2 Electrical Specifications

**Table 1–6 VAX 9000 Model 210 and Model 210VP with UPC: ac Input Power Requirements**

<b>Parameter Voltage/Frequency/Power</b>	<b>Value</b>
Voltage	380/415 V ac
Frequency	50 Hz
Phase	three-phase Y-connected (five-wire)
Power factor	0.99
Kilovolt Ampere rating	
Typical	12.6 kVA
Maximum	15.7 kVA
Current distortion factor	5%
<b>Steady-state rms current</b>	
Phase A	
Typical	19 A
Maximum	24 A
Phase B	
Typical	19 A
Maximum	24 A
Phase C	
Typical	19 A
Maximum	24 A
<b>Hardware</b>	
Recommended external circuit breaker rating <sup>1</sup>	63 A, type 3 or 4 according to IEC 947-2
Plug rating	63 A
Receptacle rating	63 A
Connector rating	63 A
Input cable length	4.57 m (15 ft)
Wires	5
Power plug IEC 309	PH-12-32963-01 Mennekes part number 1114 (63 A)
Power receptacle IEC 309	PH-12-32964-01 Mennekes part number 1128 (63 A)
Connector (female on a cable)	PH-12-32962-01 Mennekes part number 1121

<sup>1</sup>Molded magnetic circuit breaker, four-pole, type 3 or 4 according to IEC 947-2, rating 63 A, 660 V ac. Must be a locking type to facilitate lockoff.



**Table 1–7 VAX 9000 Model 310 and Model 310VP with UPC: ac Input Power Requirements**

<b>Parameter Voltage/Frequency/Power</b>	<b>Value</b>
Voltage	380/415 V ac
Frequency	50 Hz
Phase	three-phase Y-connected (five-wire)
Power factor	0.99
Kilovolt Ampere rating	
Typical	13.6 kVA
Maximum	17.0 kVA
Current distortion factor	5%
<b>Steady-state rms current</b>	
Phase A	
Typical	21 A
Maximum	26 A
Phase B	
Typical	21 A
Maximum	26 A
Phase C	
Typical	21 A
Maximum	26 A
<b>Hardware</b>	
Recommended external circuit breaker rating <sup>1</sup>	63 A, type 3 or 4 according to IEC 947-2
Plug rating	63 A
Receptacle rating	63 A
Connector rating	63 A
Input cable length	4.57 m (15 ft)
Wires	5
Power plug IEC 309	PH-12-32963-01 Mennekes part number 1114 (63 A)
Power receptacle IEC 309	PH-12-32964-01 Mennekes part number 1128 (63 A)
Connector (female on a cable)	PH-12-32962-01 Mennekes part number 1121

<sup>1</sup>Molded magnetic circuit breaker, four-pole, type 3 or 4 according to IEC 947-2, rating 63 A, 660 V ac. Must be a locking type to facilitate lockoff.

## Preparing a Site for the UPC

### 1.2 Electrical Specifications

**Table 1–8 Model 320 and Model 320VP with UPC: ac Input Power Requirements**

<b>Parameter Voltage/Frequency/Power</b>	<b>Value</b>
Voltage	380/415 V ac
Frequency	50 Hz
Phase	three-phase Y-connected (five-wire)
Power factor	0.99
Kilovolt Ampere rating	
Typical	18.4 kVA
Maximum	23.9 kVA
Current distortion factor	5%
<b>Steady-state rms current</b>	
Phase A	
Typical	28 A
Maximum	35 A
Phase B	
Typical	28 A
Maximum	35 A
Phase C	
Typical	28 A
Maximum	35 A
<b>Hardware</b>	
Recommended external circuit breaker rating <sup>1</sup>	63 A, type 3 or 4 according to IEC 947-2
Plug rating	63 A
Receptacle rating	63 A
Connector rating	63 A
Input cable length	4.57 m (15 ft)
Wires	5
Power plug IEC 309	PH-12-32963-01 Mennekes part number 1114 (63 A)
Power receptacle IEC 309	PH-12-32964-01 Mennekes part number 1128 (63 A)
Connector (female on a cable)	PH-12-32962-01 Mennekes part number 1121

<sup>1</sup>Molded magnetic circuit breaker, four-pole, type 3 or 4 according to IEC 947-2, rating 63 A, 660 V ac. Must be a locking type to facilitate lockoff.

**Table 1–9 VAX 9000 Model 330 and Model 330VP with UPC A: ac Input Power Requirements**

<b>Parameter Voltage/Frequency/Power</b>	<b>Value</b>
Voltage	380/415 V ac
Frequency	50 Hz
Phase	three-phase Y-connected (five-wire)
Power factor	0.99
Kilovolt Ampere rating	See Table 1–11
Current distortion factor	5%
<b>Steady-state rms current</b>	See Table 1–11
<b>Hardware</b>	
Recommended external circuit breaker rating <sup>1</sup>	63 A, type 3 or 4 according to IEC 947-2
Plug rating	63 A
Receptacle rating	63 A
Connector rating	63 A
Input cable length	4.57 m (15 ft)
Wires	5
Power plug IEC 309	PH-12-32963-01 Mennekes part number 1114 (63 A)
Power receptacle IEC 309	PH-12-32964-01 Mennekes part number 1128 (63 A)
Connector (female on a cable)	PH-12-32962-01 Mennekes part number 1121

<sup>1</sup>Molded magnetic circuit breaker, four-pole, type 3 or 4 according to IEC 947-2, rating 63 A, 660 V ac. Must be a locking type to facilitate lockoff.

## Preparing a Site for the UPC

### 1.2 Electrical Specifications

**Table 1–10 VAX 9000 Model 330 and Model 330VP with UPC B: ac Input Power Requirements**

<b>Parameter Voltage/Frequency/Power</b>	<b>Value</b>
Voltage	380/415 V ac
Frequency	50 Hz
Phase	three-phase Y-connected (five-wire)
Power factor	0.99
Kilovolt Ampere rating	See Table 1–11
Current distortion factor	5%
<b>Steady-state rms current</b>	See Table 1–11
<b>Hardware</b>	
Recommended external circuit breaker rating <sup>1</sup>	63 A, type 3 or 4 according to IEC 947-2
Plug rating	63 A
Receptacle rating	63 A
Connector rating	63 A
Input cable length	4.57 m (15 ft)
Wires	5
Power plug IEC 309	PH-12-32963-01 Mennekes part number 1114 (63 A)
Power receptacle IEC 309	PH-12-32964-01 Mennekes part number 1128 (63 A)
Connector (female on a cable)	PH-12-32962-01 Mennekes part number 1121

<sup>1</sup>Molded magnetic circuit breaker, four-pole, type 3 or 4 according to IEC 947-2, rating 63 A, 660 V ac. Must be a locking type to facilitate lockoff.

**Table 1–11 Steady-State kVA and rms Current for One-Side Powering of VAX 9000 Model 330 and Model 330VP with UPC**

	<b>Side A Powered (UPC A)</b>		<b>Side B Powered (UPC B)</b>		<b>Both Sides Powered (UPC A and UPC B)</b>	
	<b>Typical</b>	<b>Max</b>	<b>Typical</b>	<b>Max</b>	<b>Typical</b>	<b>Max</b>
kVA	18.4	23.0	13.6	17.0	26.4	33.1
<b>Current (Amperes)</b>						
Phase A	28	35	21	26	40	50
Phase B	28	35	21	26	40	50
Phase C	28	35	21	26	40	50
Total	84	105	63	78	120	150

## Preparing a Site for the UPC 1.2 Electrical Specifications

**Table 1–12 Steady-State kVA and rms Current for One-Side Powering of VAX 9000 Model 340 and Model 340VP with UPC**

	Side A Powered (UPC A)		Side B Powered (UPC B)		Both Sides Powered (UPC A and UPC B)	
	Typical	Max	Typical	Max	Typical	Max
kVA	18.4	23.0	18.4	23.0	31.3	39.1
Current (Amperes)						
Phase A	28	35	28	35	47	59
Phase B	28	35	28	35	47	59
Phase C	28	35	28	35	47	59
Total	84	105	84	105	141	177

**Table 1–13 VAX 9000 Model 340 and Model 340VP with UPC A: ac Input Power Requirements**

Parameter Voltage/Frequency/Power	Value
Voltage	380/415 V ac
Frequency	50 Hz
Phase	three-phase Y-connected (five-wire)
Power factor	0.99
Kilovolt Ampere rating	See Table 1–12
Current distortion factor	5%
<b>Steady-state rms current</b>	See Table 1–12
<b>Hardware</b>	
Recommended external circuit breaker rating <sup>1</sup>	63 A, type 3 or 4 according to IEC 947-2
Plug rating	63 A
Receptacle rating	63 A
Connector rating	63 A
Input cable length	4.57 m (15 ft)
Wires	5
Power plug IEC 309	PH-12-32963-01 Mennekes part number 1114 (63 A)
Power receptacle IEC 309	PH-12-32964-01 Mennekes part number 1128 (63 A)
Connector (female on a cable)	PH-12-32962-01 Mennekes part number 1121

<sup>1</sup>Molded magnetic circuit breaker, four-pole, type 3 or 4 according to IEC 947-2, rating 63 A, 660 V ac. Must be a locking type to facilitate lockoff.

## Preparing a Site for the UPC

### 1.2 Electrical Specifications

**Table 1–14 VAX 9000 Model 340 and Model 340VP with UPC B: ac Input Power Requirements**

<b>Parameter Voltage/Frequency/Power</b>	<b>Value</b>
Voltage	380/415 V ac
Frequency	50 Hz
Phase	three-phase Y-connected (five-wire)
Power factor	0.99
Kilovolt Ampere rating	See Table 1–12
Current distortion factor	5%
<b>Steady-state rms Current</b>	See Table 1–12
<b>Hardware</b>	
Recommended external circuit breaker rating <sup>1</sup>	63 A, type 3 or 4 according to IEC 947-2
Plug rating	63 A
Receptacle rating	63 A
Connector rating	63 A
Input cable length	4.57 m (15 ft)
Wires	5
Power plug IEC 309	PH-12-32963-01 Mennekes part number 1114 (63 A)
Power receptacle IEC 309	PH-12-32964-01 Mennekes part number 1128 (63 A)
Connector (female on a cable)	PH-12-32962-01 Mennekes part number 1121

<sup>1</sup>Molded magnetic circuit breaker, four-pole, type 3 or 4 according to IEC 947-2, rating 63 A, 660 V ac. Must be a locking type to facilitate lockoff.

**Table 1–15 VAX 9000 Model 410 and Model 410VP with UPC: ac Input Power Requirements**

<b>Parameter Voltage/Frequency/Power</b>	<b>Value</b>
Voltage	380/415 V ac
Frequency	50 Hz
Phase	three-phase Y-connected (five-wire)
Power factor	0.99
Kilovolt Ampere rating	
Typical	13.6 kVA
Maximum	17.0 kVA
Current distortion factor	5%
<b>Steady-state rms Current</b>	
Phase A	
Typical	21 A
Maximum	26 A
Phase B	
Typical	21 A
Maximum	26 A
Phase C	
Typical	21 A
Maximum	26 A
<b>Hardware</b>	
Recommended external circuit breaker rating <sup>1</sup>	63 A, type 3 or 4 according to IEC 947-2
Plug rating	63 A
Receptacle rating	63 A
Connector rating	63 A
Input cable length	4.57 m (15 ft)
Wires	5
Power plug IEC 309	PH-12-32963-01 Mennekes part number 1114 (63 A)
Power receptacle IEC 309	PH-12-32964-01 Mennekes part number 1128 (63 A)
Connector (female on a cable)	PH-12-32962-01 Mennekes part number 1121

<sup>1</sup>Molded magnetic circuit breaker, four-pole, type 3 or 4 according to IEC 947-2, rating 63 A, 660 V ac. Must be a locking type to facilitate lockoff.

## Preparing a Site for the UPC

### 1.2 Electrical Specifications

**Table 1–16 VAX 9000 Model 420 and Model 420VP with UPC: ac Input Power Requirements**

<b>Parameter Voltage/Frequency/Power</b>	<b>Value</b>
Voltage	380/415 V ac
Frequency	50 Hz
Phase	three-phase Y-connected (five-wire)
Power factor	0.99
Kilovolt Ampere rating	
Typical	18.4 kVA
Maximum	23.0 kVA
Current distortion factor	5%
<b>Steady-state rms Current</b>	
Phase A	
Typical	28 A
Maximum	35 A
Phase B	
Typical	28 A
Maximum	35 A
Phase C	
Typical	28 A
Maximum	35 A
<b>Hardware</b>	
Recommended external circuit breaker rating <sup>1</sup>	63 A, type 3 or 4 as per IEC 947-2
Plug rating	63 A
Receptacle rating	63 A
Connector rating	63 A
Input cable length	4.57 m (15 ft)
Wires	5
Power plug IEC 309	PH-12-32963-01 Mennekes part number 1114 (63 A)
Power receptacle IEC 309	PH-12-32964-01 Mennekes part number 1128 (63 A)
Connector (female on a cable)	PH-12-32962-01 Mennekes part number 1121

<sup>1</sup>Molded magnetic circuit breaker, four-pole, type 3 or 4 according to IEC 947-2, rating 63 A, 660 V ac. Must be a locking type to facilitate lockoff.



## Preparing a Site for the UPC 1.2 Electrical Specifications

**Table 1–17 VAX 9000 Model 430 and Model 430VP with UPC A: ac Input Power Requirements**

Parameter Voltage/Frequency/Power	Value
Voltage	380/415 V ac
Frequency	50 Hz
Phase	three-phase Y-connected (five-wire)
Power factor	0.99
Kilovolt Ampere rating	See Table 1–19
Current distortion factor	5%
<b>Steady-state rms Current</b>	See Table 1–19
<b>Hardware</b>	
Recommended external circuit breaker rating <sup>1</sup>	63 A, type 3 or 4 according to IEC 947-2
Plug rating	63 A
Receptacle rating	63 A
Connector rating	63 A
Input cable length	4.57 m (15 ft)
Wires	5
Power plug IEC 309	PH-12-32963-01 Mennekes part number 1114 (63 A)
Power receptacle IEC 309	PH-12-32964-01 Mennekes part number 1128 (63 A)
Connector (female on a cable)	PH-12-32962-01 Mennekes part number 1121

<sup>1</sup>Molded magnetic circuit breaker, four-pole, type 3 or 4 according to IEC 947-2, rating 63 A, 660 V ac. Must be a locking type to facilitate lockoff.

## Preparing a Site for the UPC

### 1.2 Electrical Specifications

**Table 1–18 VAX 9000 Model 430 and Model 430VP with UPC B: ac Input Power Requirements**

<b>Parameter Voltage/Frequency/Power</b>	<b>Value</b>
Voltage	380/415 V ac
Frequency	50 Hz
Phase	three-phase Y-connected (five-wire)
Power factor	0.99
Kilovolt Ampere rating	See Table 1–19
Current distortion factor	5%
<b>Steady-state rms Current</b>	See Table 1–19
<b>Hardware</b>	
Recommended external circuit breaker rating <sup>1</sup>	63 A, type 3 or 4 according to IEC 947-2
Plug rating	63 A
Receptacle rating	63 A
Connector rating	63 A
Input cable length	4.57 m (15 ft)
Wires	5
Power plug IEC 309	PH-12-32963-01 Mennekes part number 1114 (63 A)
Power receptacle IEC 309	PH-12-32964-01 Mennekes part number 1128 (63 A)
Connector (female on a cable)	PH-12-32962-01 Mennekes part number 1121

<sup>1</sup>Molded magnetic circuit breaker, four-pole, type 3 or 4 according to IEC 947-2, rating 63 A, 660 V ac. Must be a locking type to facilitate lockoff.

**Table 1–19 Steady-State kVA and rms Current for One-Side Powering of VAX 9000 Model 430 and Model 430VP with UPC**

	<b>Side A Powered (UPC A)</b>		<b>Side B Powered (UPC B)</b>		<b>Both Sides Powered (UPC A and UPC B)</b>	
	<b>Typical</b>	<b>Max</b>	<b>Typical</b>	<b>Max</b>	<b>Typical</b>	<b>Max</b>
kVA	18.4	23.0	13.6	17.0	26.4	33.1
<b>Current (Amperes)</b>						
Phase A	28	35	21	26	40	50
Phase B	28	35	21	26	40	50
Phase C	28	35	21	26	40	50
Total	84	105	63	78	120	150

## Preparing a Site for the UPC 1.2 Electrical Specifications

**Table 1–20 Steady-State kVA and rms Current for One-Side Powering of VAX 9000 Model 440 and Model 440VP with UPC**

	Side A Powered (UPC A)		Side B Powered (UPC B)		Both Sides Powered (UPC A and UPC B)	
	Typical	Max	Typical	Max	Typical	Max
kVA	18.4	23.0	18.4	23.0	31.3	39.1
Current (Amperes)						
Phase A	28	35	28	35	47	59
Phase B	28	35	28	35	47	59
Phase C	28	35	28	35	47	59
Total	84	105	84	105	141	177

**Table 1–21 VAX 9000 Model 440 and Model 440VP with UPC A: ac Input Power Requirements**

Parameter Voltage/Frequency/Power	Value
Voltage	380/415 V ac
Frequency	50 Hz
Phase	three-phase Y-connected (five-wire)
Power factor	0.99
Kilovolt Ampere rating	See Table 1–20
Current distortion factor	5%
<b>Steady-state rms Current</b>	See Table 1–20
<b>Hardware</b>	
Recommended external circuit breaker rating <sup>1</sup>	63 A, type 3 or 4 according to IEC 947-2
Plug rating	63 A
Receptacle rating	63 A
Connector rating	63 A
Input cable length	4.57 m (15 ft)
Wires	5
Power plug IEC 309	PH-12-32963-01 Mennekes part number 1114 (63 A)
Power receptacle IEC 309	PH-12-32964-01 Mennekes part number 1128 (63 A)
Connector (female on a cable)	PH-12-32962-01 Mennekes part number 1121

<sup>1</sup>Molded magnetic circuit breaker, four-pole, type 3 or 4 according to IEC 947-2, rating 63 A, 660 V ac. Must be a locking type to facilitate lockoff.

## Preparing a Site for the UPC

### 1.2 Electrical Specifications

**Table 1–22 VAX 9000 Model 440 and Model 440VP with UPC B: ac Input Power Requirements**

<b>Parameter Voltage/Frequency/Power</b>	<b>Value</b>
Voltage	380/415 V ac
Frequency	50 Hz
Phase	three-phase Y-connected (five-wire)
Power factor	0.99
Kilovolt Ampere rating	See Table 1–20
Current distortion factor	5%
<b>Steady-state rms Current</b>	See Table 1–20
<b>Hardware</b>	
Recommended external circuit breaker rating <sup>1</sup>	63 A, type 3 or 4 according to IEC 947-2
Plug rating	63 A
Receptacle rating	63 A
Connector rating	63 A
Input cable length	4.57 m (15 ft)
Wires	5
Power plug IEC 309	PH-12-32963-01 Mennekes part number 1114 (63 A)
Power receptacle IEC 309	PH-12-32964-01 Mennekes part number 1128 (63 A)
Connector (female on a cable)	PH-12-32962-01 Mennekes part number 1121

<sup>1</sup>Molded magnetic circuit breaker, four-pole, type 3 or 4 according to IEC 947-2, rating 63 A, 660 V ac. Must be a locking type to facilitate lockoff.

#### 1.2.2 Grounding

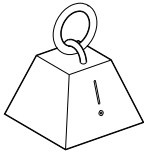
Grounding requirements for the UPC ac supply are as follows:

1. You must install an insulated grounding conductor as part of the branch circuit that supplies the UPC or VAX 9000 system. This grounding conductor needs to be the same size, have the same insulation material, and be the same thickness as the grounded and ungrounded branch circuit supply conductors. To clearly identify the insulated grounding conductor in the branch circuit, the conductor cable must be green, with or without one or more yellow stripes.
2. You must ground the branch circuit grounding conductor to earth at the service equipment or, if supplied by a separately derived system, at the supply transformer or motor-generator set.
3. You must use only attachment-plug receptacles of a grounding type, in the vicinity of the UPC or VAX 9000 system. You must connect the grounding conductors serving these receptacles, to earth at the service equipment.

---

## Unpacking and Inspecting UPC Kit Contents

This chapter details the procedures for unpacking and installing the UPC, and describes hazard and safety considerations.



---

**WARNING**

The UPC cabinet weighs more than 425 kg. It takes at least two people to move the cabinet.

---

---

**ATTENTION**

L'armoire UPC pesant plus de 425 kg, deux personnes au moins seront nécessaires pour la déplacer.

---

---

**WARNUNG**

Der UPC-Gehäuseschrank wiegt mehr als 425 kg. Zum Transport werden mindestens zwei Personen benötigt.

---

---

**ATTENCION**

El armazón del UPC pesa más de 425 kg. Son necesarias al menos dos personas para moverlo.

---

### 2.1 Hazard and Safety Considerations

This section includes advice on electrostatic discharge (ESD), Federal Communication Commission (FCC) compliance, and safety precautions.

#### 2.1.1 Electrostatic Discharge

The UPC contains components that can be damaged by electrostatic discharge. Observe Digital antistatic precautions when working on the UPC.

## Unpacking and Inspecting UPC Kit Contents

### 2.1 Hazard and Safety Considerations

#### 2.1.2 FCC Compliance

Part 15J of the FCC rules and regulations contains electromagnetic emission standards that computing devices must meet. These regulations address issues pertaining to radio and television communications interference. The UPC is manufactured to meet these FCC requirements, and also Verband Deutscher Elektrotechniker (VDE) requirements in Europe. Some of the practices used in the design of the UPC to reduce electrical and electromagnetic interference are as follows:

- Using shielded cables passing through an input/output bulkhead
- Installing gaskets in cabinet panels and doors
- Grounding the system correctly

If you do not adhere to these practices, then you can invalidate VDE or FCC certification. Digital has its own electromagnetic compatibility (EMC) standards, that exceed FCC regulations. The UPC is put through extensive EMC testing. This is done so that the UPC can be used in most computer room environments without causing interference to other systems.

#### 2.1.3 Safety Precautions

Observe the following standard safety precautions when installing the UPC:

- Use caution when removing the UPC cabinet from its shipping pallet; you require at least two people for this operation.
- Have a qualified electrician verify proper grounding of power receptacles.
- Remove all watches and jewelry before working on the UPC.
- Place all circuit breakers in the OFF position before plugging in the power cable.
- Ensure that the UPC is correctly grounded.
- Ensure that all connections to the utility power supply are correct before powering-up the system.
- When performing preventive or corrective maintenance use the lockout/tagout procedure described in Appendix B.
- A single individual must never work on the UPC alone.
- Observe all customer safety procedures.
- Do not otherwise remove any of the safety covers when the UPC is operational. After you finishing any work on the UPC, remove all test equipment and tools before applying power to the system.

## 2.2 Unpacking and Inspection

The UPC is part of the VAX 9000 System and follows the same unpacking and inspection procedure. Before you unload the UPC from the truck, check the location of the installation site in the computer room. Also check the access to the computer room to determine the order in which you must position the cabinets. Place the cartons in the unpacking area and unpack them in the required order. This allows you to unpack each cabinet, and roll it into place without obstruction from the other system cartons.

# Unpacking and Inspecting UPC Kit Contents

## 2.2 Unpacking and Inspection

---

### NOTE

---

See the site installation plan to determine where the shipping company's responsibility ends, and Digital Customer Services responsibility begins. Determine who is responsible for:

- Unloading the system from the truck onto the loading dock
  - Moving the system from the loading dock into the building
  - Moving the system to the unpacking area
- 

You need the items listed in Table 2–1 to unpack and install the UPC. The removal of the cabinet from the pallet requires at least two people.

**Table 2–1 Tools and Resources**

Item	Use
Shipping list	To verify that all hardware has been delivered
Digital voltmeter	To verify power requirements at installation site
9/16 inch wrench or adjustable wrench	To remove pallet brackets and to lower leveling feet
Socket wrench	A 10 mm deep socket wrench to bolt and torque cable terminals to the UPC terminals
Bubble level	To verify that the cabinet is properly leveled

---

The following section details the unpacking and inspection procedure for the UPC, refer to the *VAX 9000 Installation Guide* for details on the rest of the VAX 9000 system.

## 2.3 Unpacking the UPC

The UPC is shipped on a pallet. Figure 2–1 shows the cabinet as it is shipped to the installation site. Use the following procedure to unpack and inspect the UPC.

---

### CAUTION

---

Wear safety goggles to avoid eye injuries during the unpacking procedure.

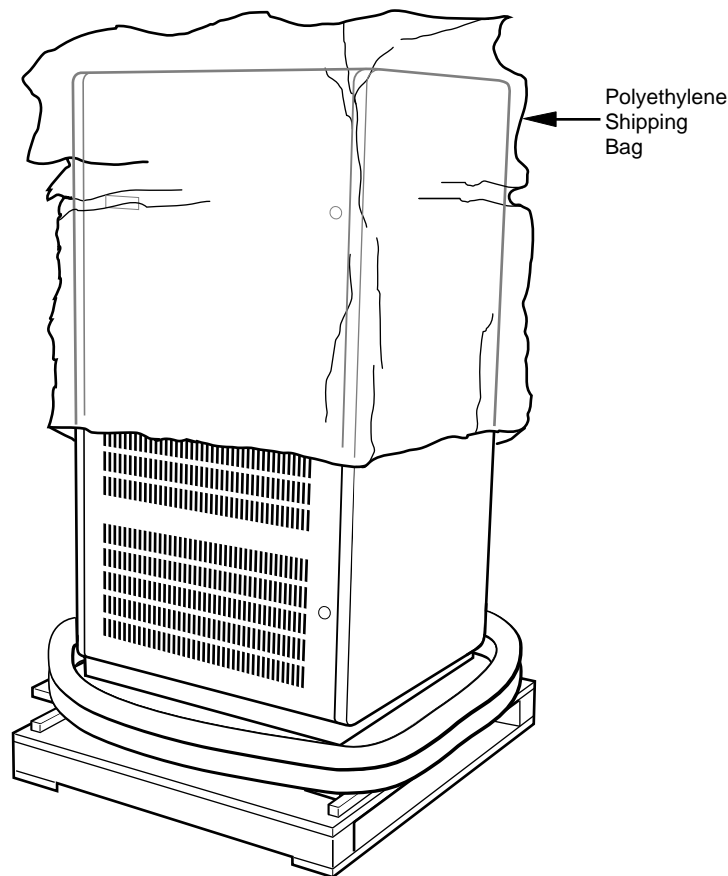
---

1. Open the accessories box.
2. Remove the ramps and place them near the cabinet.
3. Remove the shipping/accessory list from the Digital Services box and check the contents of all boxes against the shipping list. Notify the branch manager or branch supervisor of any missing, incorrect, or damaged items. Advise the customer to contact the carrier about any missing items.

## Unpacking and Inspecting UPC Kit Contents

### 2.3 Unpacking the UPC

Figure 2-1 Removing Packing Material



RE\_EN06394M\_91

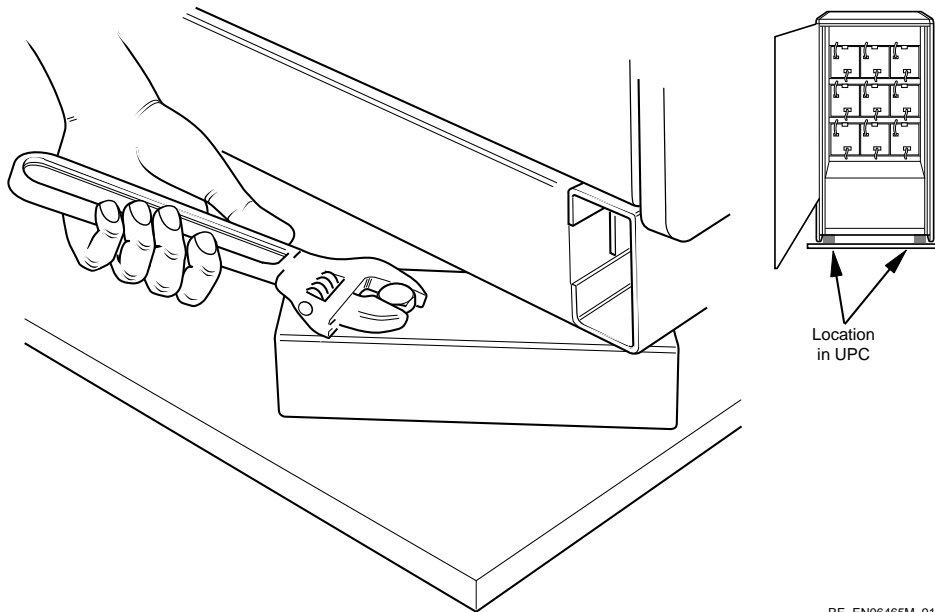
4. Check the cabinet sides, top, and front and rear doors for damage, such as dents, holes, smashed corners. If the cabinet is damaged, do the following:
  - Enter the location and extent of the damage on the Labor Activity Reporting System (LARS) form. Include a note to clarify the extent of the damage.
  - Notify the customer and your unit manager.
  - Stop unpacking the UPC until the customer notifies the insurance company and gives you permission to continue with the installation.
5. Remove all shipping bands.
6. Remove the polyethylene shipping bag. Figure 2-1.
7. Use a 9/16 inch wrench, or adjustable wrench, to remove the four bolts and shipping brackets that hold the cabinet to the pallet. Figure 2-2.



## Unpacking and Inspecting UPC Kit Contents

### 2.3 Unpacking the UPC

Figure 2–2 Removing Shipping Brackets



RE\_EN06465M\_91

8. Raise the leveling feet to their maximum height.

---

#### NOTE

---

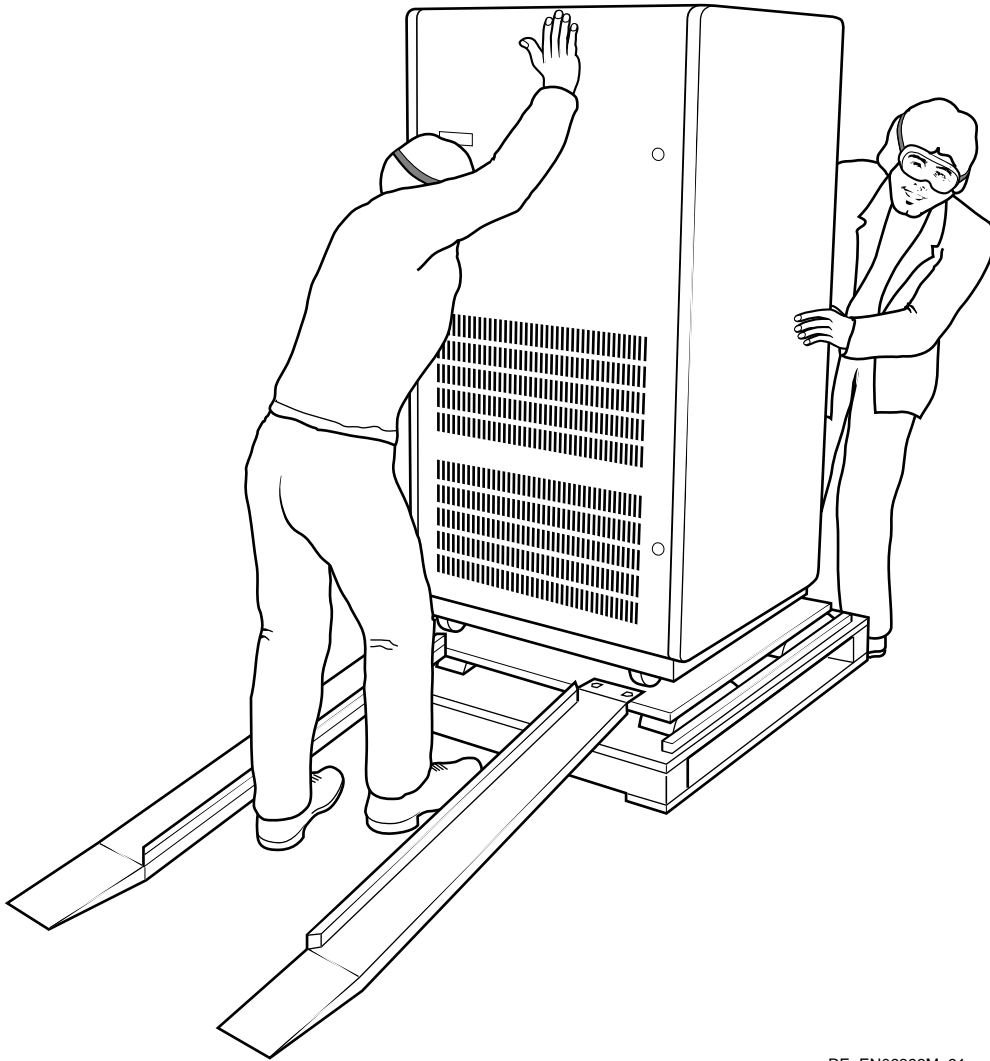
Inspect the ramps, the ramp side rails, and metal hardware for the defects described in the following list:

- Cracks more than 25 percent of the ramp depth, either across or lengthwise.
  - Knots or knotholes going through the thickness of the ramp and greater than 50 percent of the ramp width.
  - Loose, missing, or broken ramp side rails.
  - Loose, missing, or bent metal hardware. If any of these conditions exist, then **DO NOT USE THAT RAMP**. Investigate other means of removing the cabinet, or order a new ramp.
- 
9. Attach the ramps by fitting the prongs into the holes on the front of the pallet. Place the ramps on the skids so that the ramp guards are on the inside (the ramp arrows may not match those on the skid).
  10. With two people working together, slowly roll the cabinet off the pallet and down the ramps. Note that the castors on the front of the skid swivel, while those at the other end of the skid are fixed.

## Unpacking and Inspecting UPC Kit Contents

### 2.3 Unpacking the UPC

Figure 2–3 Unloading the UPC from the Pallet



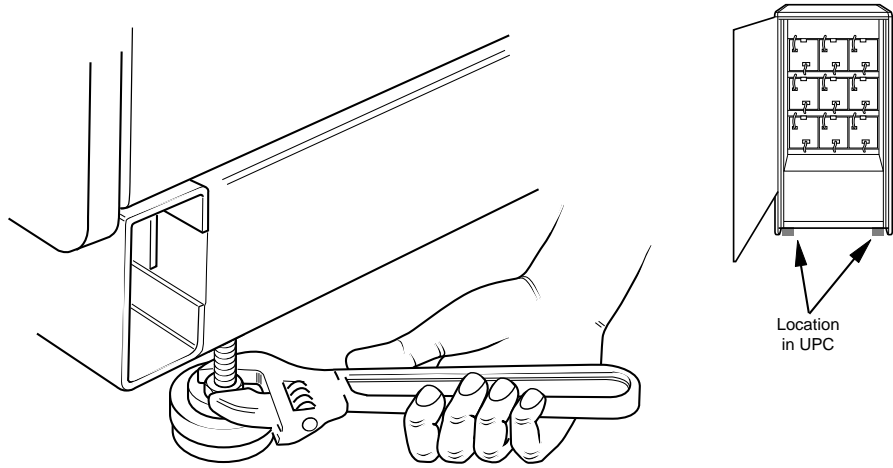
RE\_EN06393M\_91

11. Position the UPC cabinet according to the customer floor plan. You can configure the UPC at either end of the VAX 9000 system cabinet row, or you can connect the UPC remotely to the VAX 9000 system cabinet with a set of cables, up to 15 meters (50 ft) in length.
12. Use a 9/16 inch wrench, or adjustable wrench, to lower and adjust the leveling feet. You can also use a shipping bracket to lower the leveling feet; The bracket cutout and leveling feet hexnuts are the same size.
13. Use a bubble level to check if the cabinet is properly leveled.
14. The UPC unpacking and inspection procedure is now complete.

# Unpacking and Inspecting UPC Kit Contents

## 2.3 Unpacking the UPC

Figure 2-4 Adjusting the Leveling Feet



RE\_EN06395M\_91

---

## UPC Cable Installation

This chapter describes the procedure for connecting the UPC to the VAX 9000 system. Install the UPC cables after all the VAX 9000 system cabinets are positioned, leveled, and assembled.

---

### WARNING

The procedures described in this chapter involve the removal of the system covers and should be performed only by trained personnel.

---

---

### ATTENTION

Ce chapitre décrit les interventions qui demandent que les couvercles extérieurs des appareils soient enlevés. Ces travaux ne doivent être effectués que par des agents qualifiés.

---

---

### WARNUNG

Bei der Ausführung der in diesem Kapitel beschriebenen Anweisungen müssen die Systemabdeckungen entfernt werden. Dies sollte nur von geschultem Personal ausgeführt werden.

---

---

### ATTENCION

Los procedimientos descritos en este capítulo incluyen el desmontaje de las cubiertas del sistema y debe ser realizado solamente por personal entrenado.

---

### 3.1 Cabling Considerations

The UPC converts utility ac input power to dc output power and auxiliary ac output power. Cables distribute the output power to the VAX 9000 system cabinets. Depending on the customer site, you can mount the utility ac input receptacle either on a wall or on a cable to the power utility source, as opposed to hardwiring.

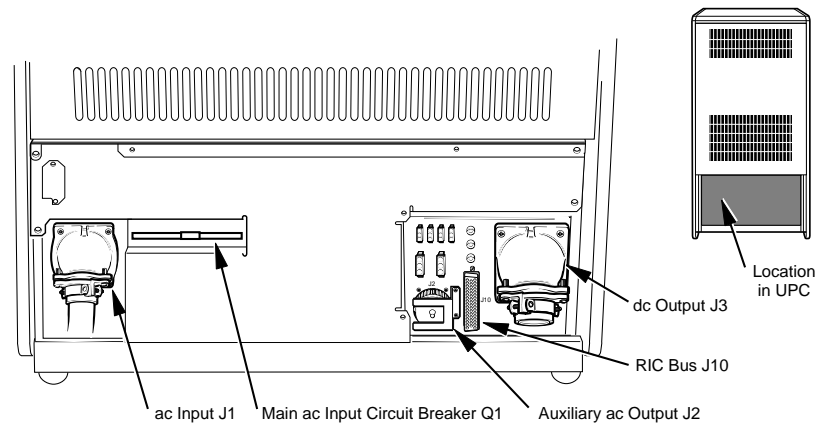
The ac input cable is factory connected, but you must connect the three output cables during installation. The accessories box, part number CK-H7245-XX, where XX represents the cable length, contains the three output cables and also the protective bustle for the IOA cabinet external cables. All external cables

## UPC Cable Installation

### 3.1 Cabling Considerations

connect between the rear connector panels of the IOA cabinet and the UPC respectively. Figure 3–1 shows the rear connector panel of the UPC.

**Figure 3–1 Rear of the UPC**



RE\_EN06438M\_91

Table 3–1 lists the UPC output and control cables, their part numbers, and the relevant VAX 9000 system model.

**Table 3–1 UPC Output and Control Cables**

Cable	Part Number	VAX 9000 Model and Description
ac output cable	17-02118-0X	Model 200, Model 400 X represents cable length (10 ft, 20 ft, 30 ft, 40 ft or 50 ft)
dc cable	17-02620-0X	Model 200 X represents cable length (10 ft, 20 ft, 30 ft, 40 ft or 50 ft)
dc cable	17-02761-0X	Model 400 (shielded) X represents cable length (10 ft, 20 ft, 30 ft, 40 ft or 50 ft)
Signal cable	17-02117-0X	RIC Bus Model 200, 400 X represents cable length (10 ft, 20 ft, 30 ft, 40 ft or 50 ft)

## 3.2 Connecting the dc Cable

The dc cable connects the dc output termination J3 in the UPC to the VAX 9000 system cabinets, and supplies the dc power input for the VAX 9000 system voltage regulators. The dc power inputs into the VAX 9000 system at the IOA cabinet. For the VAX 9000 Model 200 series the dc cable contains three color-coded wires with heavy duty terminals. For the VAX 9000 Model 400 series the dc cable contains three color-coded wires with heavy duty terminals and also two ground shield wires.

Use the following steps to install the dc cable

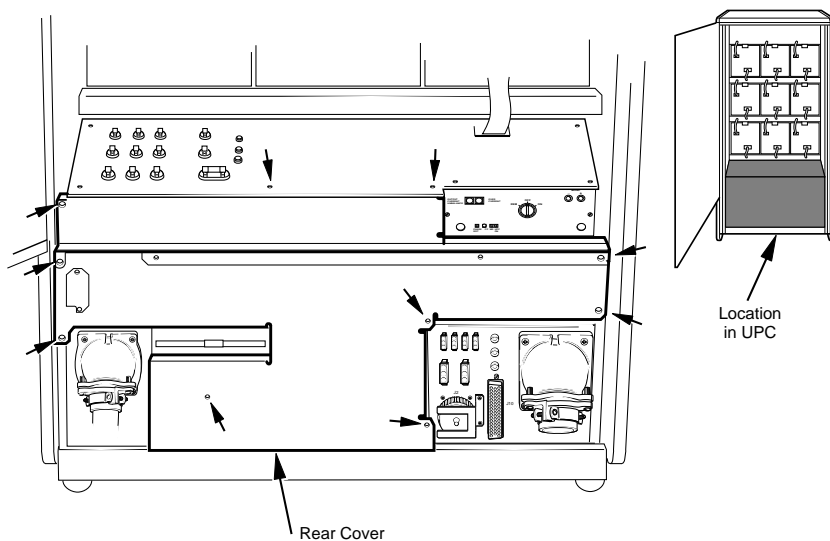
1. Open the rear door of the UPC.

## UPC Cable Installation

### 3.2 Connecting the dc Cable

2. Use a 5 mm socket wrench to remove the green and yellow earth wire from the side of the cabinet.
3. Remove the rear door by pulling up on the door hinge locking pins. Unlock the top hinge first, by pulling up and rotating the locking pin to hold the hinge open. Support the door with one hand before unlocking the bottom hinge.

**Figure 3–2 Removing the High-Voltage Chamber Rear Cover**



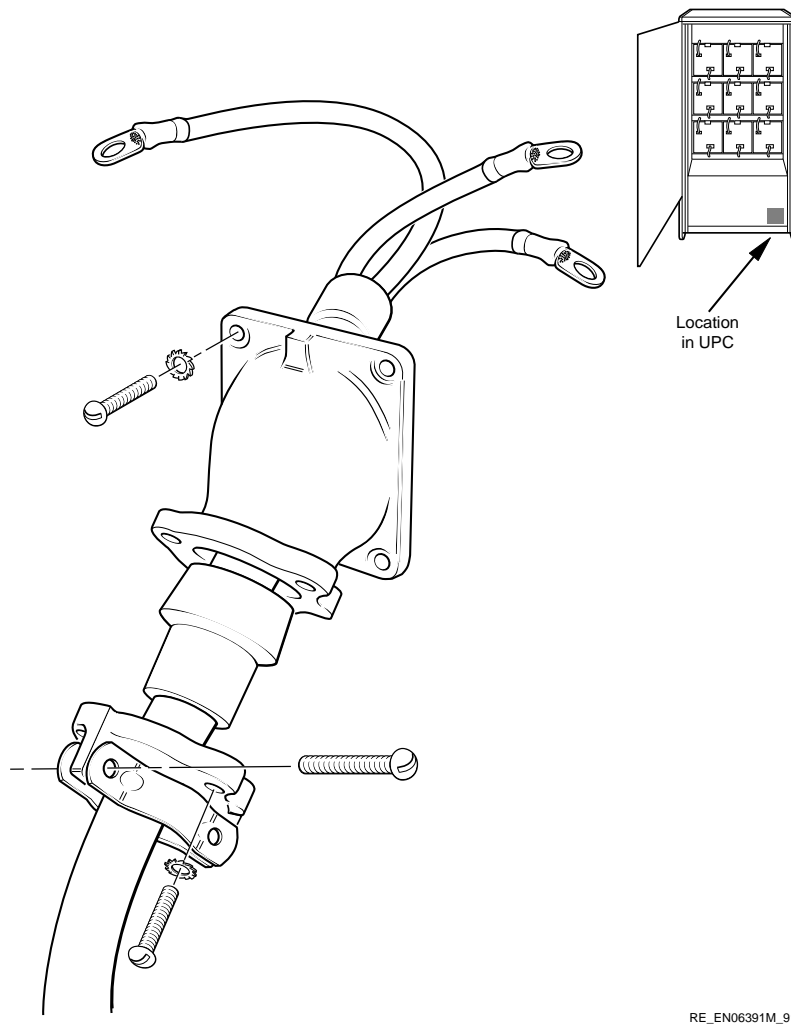
RE\_EN06437M\_91

4. Remove the high-voltage chamber rear cover by first removing the two screws arrowed from the top cover, and then remove the eight screws from the rear cover as shown in Figure 3–2
5. Remove the J3 boot from the power output panel by removing the four screws as shown in Figure 3–2, open the cable clamp and strain relief.
6. Remove the dc cable, part number 17-02761-0X, from the accessories kit.
7. Feed the dc cable through the J3 boot as shown in Figure 3–3. Leave the boot loose, do not reconnect to the power output panel. Place the terminals (crimp side up) down on the dc output terminal block.

## UPC Cable Installation

### 3.2 Connecting the dc Cable

Figure 3–3 Connecting the dc Cable



RE\_EN06391M\_91

#### NOTE

The wires on the UPC end of the cable are 150 mm (6 inches) longer than those on the IOA end. Connect the two ground shield wires to the inside of the J3 boot.

8. Use a 10 mm socket wrench to connect the terminals on the three cables to the terminals in the UPC, as indicated in Table 3–2 or Table 3–3. Tighten the terminal nuts to a torque of 5.0 Nm to 6.2 Nm (43 lbf in to 54 lbf in).

## UPC Cable Installation

### 3.2 Connecting the dc Cable

**Table 3–2 VAX 9000 Model 200 dc Cable Connections**

Wire Color	UPC Marking Wire	dc Output Terminal	IOA Marking Wire	Terminal
Red	UPCJ1-01	+	FETB-01	+140
Black	UPCJ1-02	-	FETB-02	-140
Green/yellow	UPCJ1-03	PE	FETB-03	GND

**Table 3–3 VAX 9000 Model 400 dc Cable Connections**

Wire Color	UPC Marking Wire	dc Output Terminal	IOA Marking Wire	Terminal
Red	UPC POS	+	POS	POS
Black	UPC NEG	-	NEG	NEG
Green/yellow	UPC GND	PE	GND	GND

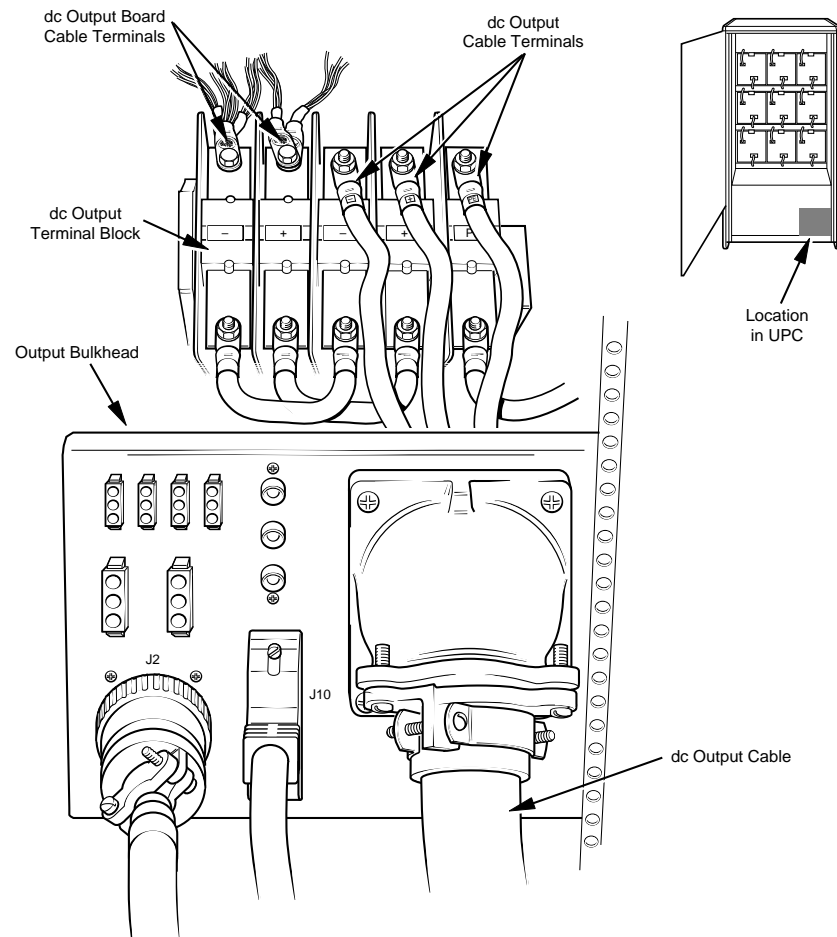
9. Reconnect the J3 boot as shown in Figure 3–4. Push up the tubing into the boot, connect the cable clamp to the boot with two screws, and connect and tighten the strain relief with two screws.



## UPC Cable Installation

### 3.2 Connecting the dc Cable

Figure 3–4 Installing UPC Cables



RE\_EN06392M\_91

10. Replace the high-voltage chamber rear cover.
11. Connect the other end of the dc cable to J1 in the VAX 9000 IOA cabinet as described in the following sections.

#### 3.2.1 Connecting the dc Output Cable to VAX 9000 Model 200 Configurations

Carry out the following steps to connect the cable:

1. Remove the top access cover from the dc input filter.
2. Feed the three cable lines through the J1 boot. The connections are made within the dc input filter.
3. Use a 9/16 inch socket wrench to connect the three cables to the dc input filter terminals.
4. See Table 3–2 for the correct connections.
5. When you have completed connecting the cables, replace the top access cover.

### **3.2.2 Connecting the dc Output Cable to VAX 9000 Model 400 Configurations**

The wires on the IOA end of the cable are shorter by six inches than those on the UPC end. Carry out the following steps to connect the cable:

1. Remove the side access cover from the dc input filter.
2. Feed the cable through the J1 boot. The connections are made within the dc input filter.
3. Use a 9/16 inch socket wrench to connect the three cables to the dc input filter terminals.
4. See Table 3–3 for the correct connections.
5. When you have completed connecting the cables, replace the side access cover.

### **3.3 Connecting the ac Output Cable**

The ac cable connects 208 V unswitched ac power from the UPC to the IOA system cabinets. The unswitched ac power supplies the BBUs in the VAX 9000 system. Carry out the following steps to connect the cable:

1. Remove the ac cable (part number 17-02118-0X) from the accessories box.
2. Remove the safety clamp from the J2 connector, and unscrew the connector cover.
3. Connect the male end of the ac cable to the J2 ac output connector as shown in Figure 3–4.
4. Replace the safety clamp.
5. Connect the female end of the ac cable to the J1 ac power in connector on the IOA cabinet.

### **3.4 Connecting the Signal Cable**

Carry out the following steps to connect the signal cable from the UPC to the IOA cabinets:

1. Remove the signal cable (part number 17-02117-0X) from the accessories box.
2. Connect the B-END of the cable to J10 on the UPC as shown in Figure 3–4.
3. Connect the A-END of the cable to the connector marked UPC on the IOA cabinet

Replace the rear door on the UPC. Install the protective bustle over the external cabling in the rear of the IOA cabinet with the attaching screws.

The UPC installation and cabling is now complete.

---

## Powering Up the UPC

This chapter describes the Safety Guidelines that you must observe, and the checklist that you must perform before powering up the UPC.

---

### WARNING

The procedures described in this chapter should be performed only by trained personnel.

---

---

### ATTENTION

Les interventions décrites dans cet ouvrage ne doivent être effectuées que par des agents qualifiés.

---

---

### WARNUNG

Die in diesem Buch beschriebenen Anweisungen sollte nur von geschultem Personal ausgeführt werden.

---

---

### ATTENCION

Los procedimientos descritos en este libro debe ser realizado solamente por personal entrenado.

---

### 4.1 Safety Guidelines

The following guidelines are essential for your personal safety:

- All Digital Services personnel must complete an H7245 UPC training course, and also complete power safety training, before performing the following power up procedure.
- A single individual must never work alone on the UPC.
- Observe all customer safety procedures.

## Powering Up the UPC

### 4.2 Before Applying Power to the UPC

### 4.2 Before Applying Power to the UPC

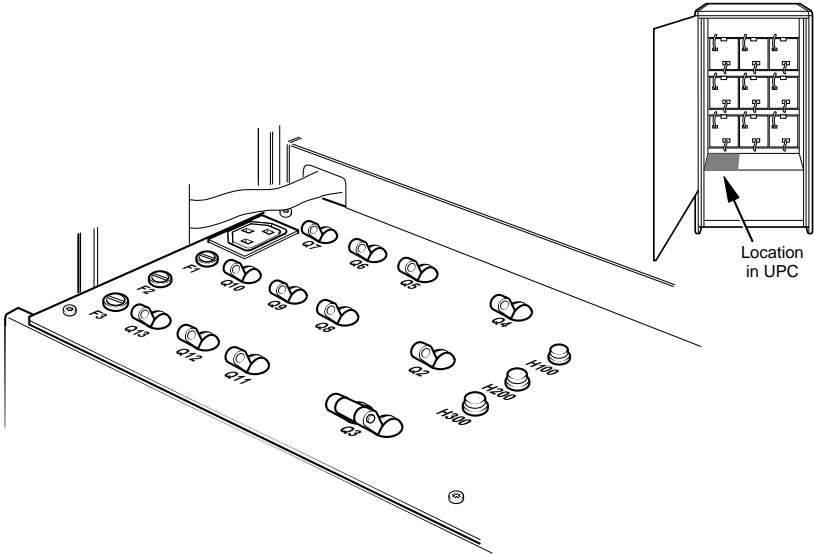
Before energizing the UPC ensure the system is set up in the following manner:

1. Ensure that the utility power supply is LOCKED OUT. See Appendix B for details.
2. Ensure that the ac input breaker Q1 on the UPC is LOCKED OUT. See Appendix B for details on lockout and tagout procedures.
3. Set the operator control panel switch in the IOA cabinet to OFF.
4. Set the REMOTE/OFF/ON switch on the UPC power control module to remote.
5. Figure 4–1 shows the circuit breaker panel. You must set the circuit breakers as follows:
  - Q5 through Q13 are set to OFF.
  - The ac output circuit breaker Q3 is set to OFF.
  - The auxiliary transformer circuit breaker Q2 is set to OFF.
  - The blower circuit breaker Q4 is set to OFF.
6. Set the operator control panel as described in Section 4.2.1
7. Ensure that the local console terminal is plugged in, turned on, and connected to the IOA cabinet.
8. Ensure that the local printer is loaded with paper, turned on, powered up, and connected to the IOA cabinet (optional).
9. Ensure that the local console terminal/local printer are set to keep a hardcopy log of the installation.

# Powering Up the UPC

## 4.2 Before Applying Power to the UPC

Figure 4-1 UPC ac Circuit Breaker Assembly

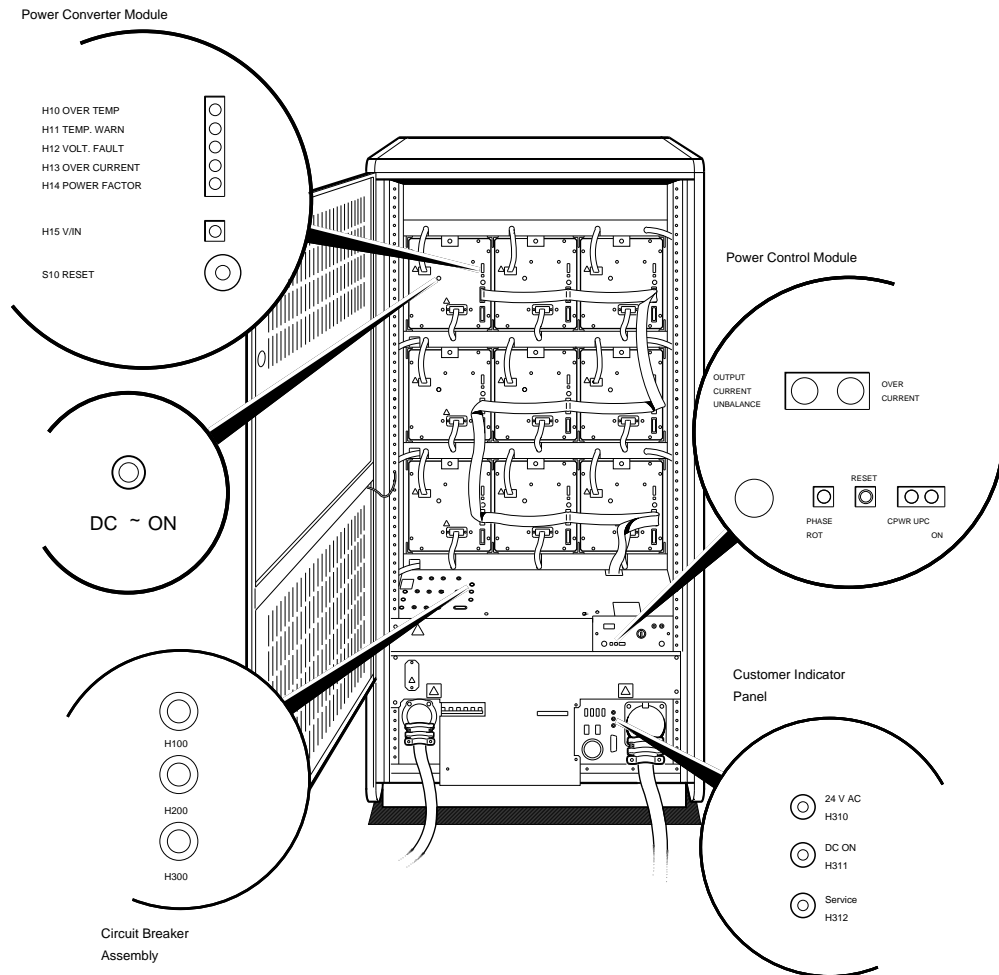


RE\_EN06469M\_91

# Powering Up the UPC

## 4.2 Before Applying Power to the UPC

Figure 4–2 UPC Indicators



RE\_EN06390C\_91

### 4.2.1 Operator Control Panel Setup

During the initial installation, you must set the operator control panel located in the IOA cabinet in the following way

- Power: OFF
- Startup: Halt
- Service Processor Access: Local/SPU

The pre-power up checks are now complete. You are now ready to power up the UPC.

## 4.3 The Power Up Sequence

This section lists the power up sequence for the UPC and also lists the indicators that are illuminated in the UPC cabinet if you complete the power up procedure successfully. Figure 4–2 shows the location of the indicators on the UPC.

---

**NOTE**

When a dual UPC configuration is used, a dc output switch is fitted to the rear of each UPC. This switch is located on the high-voltage chamber top cover between the UPC ac circuit breaker assembly and the power control module.

---

---

**NOTE**

Check that all system covers are in place before applying power to the UPC.

---

The last cable you connect prior to system power up is the ac input power cable. Review the cabling procedure to check that you have installed all system cables before plugging in the ac input power cable to the utility power receptacle.

1. Plug the ac input power cable plug into the power receptacle.
2. Unlock and untag the utility service power switch and set the service to ON.
3. Untag Q1.
4. Ensure that the dc output switch is ON. This switch must not be operated under load.
5. Set Q1, Q2 and Q4, in that order, to ON.
6. Check the following UPC LEDs:
  - Phase indicator LEDs H1, H2, H3 are illuminated
  - On the power control module, the phase rotation LED, labeled PHASE ROT, is not illuminated.
  - On each of the nine power converter modules the VOLT FAULT LEDs are illuminated.
  - On the power control module, the control power LED, labeled CPWR, is illuminated.
  - On the customer indicator panel, the 24 V ac and the service indicator are illuminated.
7. Set Q3 to ON and Q5 through Q13 to ON.
8. Check that the power factor LED on each of the nine power converter modules are illuminated.
9. Check that air is exhausting out of the top rear of the UPC.
10. If the phase rotation LED is illuminated, or if air is not exhausting out of the top rear of the cabinet, switch Q1 OFF and refer to the fault isolation flowcharts in the *H7245 Utility Port Conditioner Maintenance Information*.

## Powering Up the UPC

### 4.3 The Power Up Sequence

11. Recheck the REMOTE/OFF/ON switch on the back of the UPC to ensure it is set to REMOTE.
12. Turn the power key switch on the operator control panel to ON.

After 12 seconds the blowers in the VAX 9000 system cabinets engage, this indicates that the VAX 9000 system is now receiving power. In the UPC cabinet, ensure that:

- The LEDs shown in Table 4–1 are illuminated.
- All other LEDs are not illuminated.
- The overcurrent and ground current electromagnetic indicators on the power control module show black.

**Table 4–1 Power Up LEDs**

Module	LED	Color
Power Converter Module	DC ON	Red
Power Converter Module	H15 V/IN	Green
Power Control Module	UPC ON	Green
Power Control Module	CPWR	Green
ac Circuit Breakers Assembly	H100, H200, H300	Yellow
Customer Indicator Panel	24 V AC	Green
Customer Indicator Panel	DC ON	Green

If all the LEDs and electromagnetic indicators satisfy the above conditions, then the UPC is now powered up. Test that all of the LEDs and electromagnetic indicators are functioning correctly by carrying out the following steps:

- Push the lamp test/reset button on the UPC power control module to verify that all of the LEDs and electromagnetic indicators are working. The LEDs and electromagnetic indicators are reset to the normal condition when you release the button.
- Push the lamp test/reset button on each of the nine UPC power converter modules to verify that all of the LEDs are working. The LEDs are reset to the normal condition when you release the button.

If you have not already done so, now switch on the VAX 9000 system console terminal. If the UPC does not power up, then see the *H7245 Utility Port Conditioner Maintenance Information* for fault isolation.



## Recommended Precautions Against Electrical Accidents

This appendix highlights the causes of major electrical accidents and the recommended precautions to avoid these accidents. The most important aspect of safety involves the protection of personnel. Most electrical accidents are a result of electrical shock or burns. In addition, careless operation of equipment contributes to a large number of the accidents. Electrical accidents can be avoided by observing the following recommended precautions:

- Follow correct safety procedures.
- Turn off equipment prior to inspecting or servicing.
- Exercise extreme care near energized components.
- Use tools and equipment for their correct purpose.
- Do not wear jewelry that could come in contact with energized components.

### A.1 Body Damage Caused by Electrical Current

Increasing levels of current have increasingly devastating effects on the human body. Table A–1 summarizes the physiological sensations felt by the body when 50/60 Hz alternating current passes over the hand, through the body, to the opposite hand.

**Table A–1 Effects of Current on the Human Body**

Current (RMS Value)	Effect on Body
0 to 0.5 mA	Little or no sensation
0.5 to 1.0 mA	Tingling sensation
1.0 to 8.0 mA	Sensation of shock; not painful, victim can let go of the energized component at will
8.0 to 15 mA	Painful shock, victim can let go at will
15 to 20 mA	Painful shock, victim loses muscular control and CAN NOT let go at will
20 to 50 mA	Severe muscular contractions, breathing difficult
60 to 200 mA	Ventricular fibrillation, breathing stops

(continued on next page)

## Recommended Precautions Against Electrical Accidents

### A.1 Body Damage Caused by Electrical Current

Table A-1 (Cont.) Effects of Current on the Human Body

Current (RMS Value)	Effect on Body
200 mA upwards	Severe burns, severe muscular contractions, heart stops, breathing stops

---

## Lockout and Tagout Procedures

The Power and Safety Tool Kit contains locks and tags, a lockout device is a device that uses a lock to hold an energy isolating device in the safe position.

A tagout device is a prominent warning tag capable of being securely attached to an energy isolating device. The tagout device identifies the applier or authority having control of the energy control procedure, and contains information and/or instructions to prevent the operation of an energy isolating device. A tag is always used in conjunction with a lock to explain the purpose of the lock.

The following procedure describes how to lockout and tagout the utility supply.

1. Set the ac utility switch disconnecter or circuit breaker to the off position, and perform a LOCKOUT.
2. Tag the ac utility switch or circuit breaker.

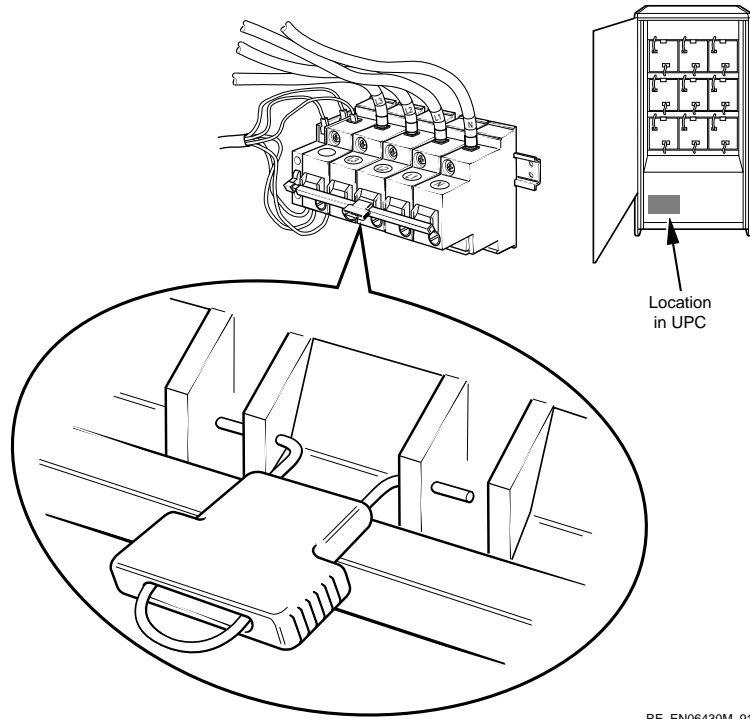
The following procedure describes how to lockout and tagout the main ac input circuit breaker Q1:

- Set Q1 to the OFF position and perform a LOCKOUT with a lock from the power and safety tool kit.
- Tag Q1.

Figure B-1 shows the main ac input circuit breaker Q1 locked out with a locking clip. You must attach a padlock to the ring of the locking clip.

# Lockout and Tagout Procedures

Figure B-1 Locking Clip Fitted to Main ac Input Circuit Breaker Q1.



RE\_EN06430M\_91

---

## Glossary

**IOA cabinet**

Input Output A cabinet. A term used within Digital to identify a particular type of system cabinet

**IOB cabinet**

Input Output B cabinet. See IOA cabinet.

**Modular hardware redundancy**

A modular design concept that allows for a certain level of hardware failure in a piece of equipment, without affecting the performance.

**Utility port conditioner**

A piece of equipment that converts utility power to provide a regulated power supply.

**Utility power**

The mains electricity supply.

**Y-connected**

A method of connecting three-phase, five-wire utility power cables. Also known as WYE-connected.

---

# Index

## A

---

- ac cable
  - Connecting the, 3–7
- ac input power receptacle, 3–1
- ac input power requirements
  - Model 210 and Model 210VP, 1–7
  - Model 310 and Model 310VP, 1–8
  - Model 320 and Model 320VP, 1–9
  - Model 330 and Model 330VP, 1–10
  - Model 330 and Model 330VP with UPC B, 1–11
  - Model 340 and Model 340VP with UPC A, 1–13
  - Model 340 and Model 340VP with UPC B, 1–13
  - Model 410 and Model 410VP, 1–14
  - Model 420 and Model 420VP, 1–15
  - Model 430 and Model 430VP with UPC A, 1–16
  - Model 430 and Model 430VP with UPC B, 1–17
  - Model 440 and Model 440VP with UPC A, 1–19
  - Model 440 and Model 440VP with UPC B, 1–19
  - Models 110, 110VP, 1–6
- Accidents, electrical
  - Common causes of, A–1
  - Consequences of, A–1
  - Precautions against, A–1
- Associated documents, viii
- Audience, intended, vii
- Auxiliary ac source
  - For BBUs, 1–1

## B

---

- BBUs, 1–1

## C

---

- Cables, external
  - Connection of, 3–2
- Circuit breaker panel, 4–2
- Console terminal, 4–2
- Conventions, viii
- CPWR, 4–5

## D

---

- dc cable
  - Connecting the, 3–2
    - Connecting to model 200, 3–4, 3–6
    - Connecting to model 400, 3–5, 3–6
- dc output cable
  - Connecting to Model 400, 3–7

## F

---

- Fault isolation flowcharts, reference to, 4–5
- FCC compliance, 2–1

## G

---

- Grounding conductor
  - Description of, 1–20

## H

---

- H7392 UPC, differences from H7245 UPC, vii
- Harmonic distortion, 1–1
- High-voltage chamber
  - Cover removal from, 3–3

## I

---

- Inspection procedure, 2–3
- IOA cabinet, 1–2

## L

---

- Lamp test/reset button, 4–6
- LARS form, 2–4
- Leveling feet, 2–5, 2–6
- Lockout procedures, B–1

## M

---

- Modular hardware redundancy, 1–2
- Muscular contractions, A–1

## O

---

Operator control panel, 4-4  
Output power panel indicators, 4-5  
Output power specifications, 1-6

## P

---

Phase rotation LED, 4-5  
Physiological effects of shock, A-1  
Power distribution  
    Lockout protection devices, 1-5  
    To the VAX 9000 system, 1-5  
Power factor, 1-1  
Power factor LED, 4-5  
Power key switch, 4-6  
Pre-power up checks, 4-4  
Printer, 4-2  
Purpose of manual, vii

## R

---

Ramps, damaged, 2-5  
REMOTE/OFF/ON switch, 4-2, 4-6  
Ride-through capability, 1-2

## S

---

Safety during installation, 2-2  
Safety goggles, 2-3  
Safety guidelines, 4-1  
Shipping list, 2-3  
Site installation plan, 2-3  
Steady-state parameters  
    Model 330 and 330VP, 1-12  
    Model 340 and 340VP, 1-12  
    Model 430 and 430VP, 1-18  
    Model 440 and 440VP, 1-18

## T

---

Tagout procedures, B-1  
Tools required, 2-3

## U

---

Unloading, 2-2  
Unloading method, 2-5  
UPC  
    Electrical specifications, 1-4  
    Environmental requirements, 1-3  
    Features, 1-2  
    Grounding conductor, 1-20  
    Introduction to, 1-1  
    Nominal configuration, 1-5  
    Operating environment, 1-4  
    Output and control cables, 3-2

## UPC (cont'd)

    Physical specifications, 1-3  
    Power up condition, 4-6  
    Power up sequence, 4-5  
    Space requirements, 1-3  
    Storage environment, 1-4  
    Utility supply, 1-1  
    weight, 2-1  
Utility power supply  
    Future requirements,, 1-5

## V

---

VAX 9000  
    Configurations, 1-2  
    Grounding conductor, 1-20  
    Platforms, 1-2  
VDE requirements, 2-2  
Ventricular fibrillation, A-1  
VOLT FAULT LEDs, 4-5