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</tr>
</tbody>
</table>
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WARNINGS AND CAUTIONS

The following warnings and cautions pertain throughout this guide.

**Warning**

Trained service personnel only.

This EMC product has more than one power supply cord. To reduce the risk of electric shock, disconnect all power supply cords before servicing.

Ground-circuit continuity is vital for safe operation of the machine. Never operate the machine with grounding conductors disconnected. Remember to reconnect any grounding conductors removed for or during any installation procedure.

**Attention**

Reservé au personnel autorisé.

Cet appareil EMC comporte plus d'un cordon d'alimentation. Afin de prévenir les chocs électriques, débranchez tous les cordons d'alimentation avant de faire le dépannage.

Un circuit de terre continu est essentiel en vue du fonctionnement sécurisé de l'appareil. Ne mettez jamais l'appareil en marche lorsque le conducteur de mise à la terre est débranché.

Warnung

Nur für authorisiertes Fachpersonal.


Additional warnings and cautions

Before attempting to service the EMC hardware described in this document, observe the following additional warnings and cautions:

**WARNING**

The hardware enclosure contains no user-serviceable parts, so it should not be moved or opened for any reason by untrained persons. If the hardware needs to be relocated or repaired, only qualified personnel familiar with safety procedures for electrical equipment and EMC hardware should access components inside the unit or move the unit.

**WARNING**

This product operates at high voltages. To protect against physical harm, power off the system whenever possible while servicing.

**WARNING**

In case of fire or other emergency involving the EMC product, isolate the product's power and alert appropriate personnel.

**CAUTION**

Trained personnel are advised to exercise great care at all times when working on EMC hardware. Remember to:

- Remove rings, watches, or other jewelry and neckties before you begin any procedures.
- Use caution near any moving part and any part that may start unexpectedly such as fans, motors, solenoids, and so on.
- Always use the correct tools for the job.
- Always use the correct replacement parts.
- Keep all paperwork, including incident reports, up to date, complete, and accurate.
Static precautions

EMC incorporates state-of-the-art technology in its designs, including the use of LSI and VLSI components. These chips are very susceptible to damage caused by static discharge and need to be handled accordingly.

⚠️ CAUTION ⚠️

Before handling printed circuit boards or other parts containing LSI and VLSI components, observe the following precautions:

- Store all printed circuit boards in antistatic bags.
- Use a ground strap whenever you handle a printed circuit board.
- Unless specifically designed for nondisruptive replacement, never plug or unplug printed circuit boards with the power on. Severe component damage may result.
PREFACE

As part of an effort to improve and enhance the performance and capabilities of its product lines, EMC periodically releases revisions of its hardware and software. Therefore, some functions described in this document may not be supported by all versions of the software or hardware currently in use. For the most up-to-date information on product features, refer to your product release notes.

If a product does not function properly or does not function as described in this document, please contact your EMC representative.

This document provides information about the physical and environmental requirements, floor placement, connectivity, and power requirements for planning the installation of DLm systems.

Audience

This manual is part of the documentation set for the EMC Disk Library for mainframe (DLm) system and is intended for customers, including the system administrators, the customer’s electrician, and EMC Sales and Customer Support personnel involved in planning the installation of DLm systems.

Chapter 1, page 1-17 provides an overview of the physical planning for the DLm systems.

Chapter 2, page 2-23 provides an overview of the connectivity for the DLm systems.

Chapter 3, page 3-27 explains the physical and environmental requirements for DLm systems.

Chapter 4, page 4-41 provides the power requirements and information about connecting the DLm systems to a customer’s source PDU.

Chapter 5, page 5-51 provides the suggested system floor placement for DLm systems.

This document contains information about the VTEC bay and the VNX VG8 bay of a DLm8000. Refer to the EMC VMAX 20K/VMAX Series Physical Planning Guide [P/N 300-008-601] for information about the VMAX related documentation:

- EMC Disk Library for mainframe User Guide
- EMC Disk Library for mainframe Unpacking Guide
EMC Disk Library for mainframe Release Notes

The EMC documents specified here and additional Celerra information are available in the EMC Powerlink website: http://Powerlink.EMC.com.

Conventions used in this document

EMC uses the following conventions for special notices.

Note: A note presents information that is important, but not hazard-related.

⚠️ CAUTION

A caution contains information essential to avoid data loss or damage to the system or equipment.

IMPORTANT

An important notice contains information essential to software or hardware operation.

⚠️ WARNING

A warning contains information essential to avoid hazardous situations that can cause severe personal injury, death, or substantial property damage if you ignore the warning.

⚠️ DANGER

A danger notice contains information essential to avoid hazardous situations that will cause severe personal injury, death, or substantial property damage if you ignore the message.
Typographical conventions

EMC uses the following type style conventions in this document:

**Normal**
Used in running (nonprocedural) text for:
- Names of interface elements (such as names of windows, dialog boxes, buttons, fields, and menus)
- Names of resources, attributes, pools, Boolean expressions, buttons, DQL statements, keywords, clauses, environment variables, functions, utilities
- URLs, pathnames, filenames, directory names, computer names, filenames, links, groups, service keys, file systems, notifications

**Bold**
Used in running (nonprocedural) text for:
- Names of commands, daemons, options, programs, processes, services, applications, utilities, kernels, notifications, system calls, man pages
Used in procedures for:
- Names of interface elements (such as names of windows, dialog boxes, buttons, fields, and menus)
- What user specifically selects, clicks, presses, or types

**Italic**
Used in all text (including procedures) for:
- Full titles of publications referenced in text
- Emphasis (for example a new term)
- Variables

**Courier**
Used for:
- System output, such as an error message or script
- URLs, complete paths, filenames, prompts, and syntax when shown outside of running text

**Courier bold**
Used for:
- Specific user input (such as commands)

**Courier, italic**
Used for:
- Arguments used in examples of command-line syntax
- Variables in examples of screen or file output
- Variables in path names

**Courier, bold, italic**
Variables used in a command-line sample

**<>**
Angle brackets enclose parameter or variable values supplied by the user

**[]**
Square brackets enclose optional values
Preface

| Vertical bar indicates alternate selections - the bar means "or"
| { } Braces indicate content that you must specify (that is, x or y or z)
| ... Ellipses indicate nonessential information omitted from the example

Where to get help

EMC support, product, and licensing information can be obtained as follows.

Product information — For latest documentation, release notes, software updates, or for information about EMC products, licensing, and service, go to the EMC Powerlink website (registration required) at:

http://Powerlink.EMC.com

Technical support — For technical support, go to Powerlink and select Support. On the Support page, you will see several options, including one for making a service request. Note that to open a service request, you must have a valid support agreement. Please contact your EMC sales representative for details about obtaining a valid support agreement or with questions about your account.

Your comments

Your suggestions will help us continue to improve the accuracy, organization, and overall quality of the user publications. Please send your opinions of this document to:

techpubcomments@EMC.com

If you have issues, comments, or questions about specific information or procedures, please include the title and, if available, the part number, the revision (for example, A04), the page numbers, and any other details that will help us locate the subject you are addressing.
CHAPTER 1
Physical Planning

This chapter covers the tasks to be completed when planning an installation of DLm systems at the customer site. This document contains information about the VTEC bay and the VNX VG8 bay of a DLm8000. Refer to the EMC VMAX 20K/VMAX Series Physical Planning Guide [P/N 300-008-601] for information about the VMAX. Read the information and follow the procedures in the order documented in this chapter:

◆ Planning overview................................................................. 18
◆ DLm system presite considerations....................................... 19
◆ Pre-installation considerations............................................. 20
Physical Planning

Planning overview

This section provides an overview of the planning requirements for EMC® Disk Library for mainframe (DLm) installation. It reviews EMC’s responsibilities and outlines your responsibilities as a DLm user.

Note: Inform EMC of any labor union-based restrictions or security clearance requirements prior to delivery.

The DLm systems must be installed in a properly equipped computer room with controlled temperature and humidity, proper airflow and ventilation, proper power and grounding, system cable routing facilities, fire equipment, and so on. A raised floor is recommended, although it is not required. One or more planning sessions with your EMC Systems Engineer and EMC Customer Support Representative will be necessary to close all the details related to installation. Table 1 on page 18 lists the responsibility summary at the first planning session.

Table 1  Pre-installation responsibility summary

<table>
<thead>
<tr>
<th>EMC</th>
<th>Customer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide all details necessary for site planning and preparation.</td>
<td>Provide an environment that supports safe installation of the DLm system and promotes its reliable long-term operation.</td>
</tr>
<tr>
<td>Complete and process the Installation Planning Task Sheet and Presite Survey.</td>
<td>Provide appropriate modem phone line, power, cooling and ventilation, humidity control, floor load capability, and service clearances as required.</td>
</tr>
<tr>
<td>Arrange for shipment and delivery through an appropriate method.</td>
<td>Participate in planning sessions as required to ensure a smooth and uncomplicated installation.</td>
</tr>
</tbody>
</table>
| Install a properly working system. | Provide the following cables:  
  - The Fibre Channel cables to connect the VMAX FA ports to the DS5100B Fibre Channel switches  
  - Two 1 GbE cables Control Stations to the ATI 1GbE switches. |

Note: This document contains information about the VTEC bay and the VNX VG8 bay of a DLm8000. Refer to the EMC VMAX 20K/VMAX Series Physical Planning Guide [P/N 300-008-601] for information about the VMAX.
DLm system presite considerations

When planning the installation site for your DLm system, meet with your EMC representative to complete the presite plan.

Physical specifications

“Physical and Environmental Specifications” on page 27 provides overall system dimensions for the DLm systems.

General considerations

Before installing the DLm system at your site, consider these factors:

◆ Weight capacities of the service elevator if delivery is to another floor
◆ Availability of an equipment ramp if the receiving floor is not on the same level as the computer room floor

Note: All portions of the bay should clear ramp and threshold slopes up to 1:10 (rise to run ratio), per Code of Federal Regulations – ADA Standards for Accessible Design, 28 CFR Part 36.

◆ Weight capacities of the loading dock
◆ Weight capacities of the tailgate

Other requirements are:

◆ Appropriate floor covering required for protection
◆ Direct dial-up phone line (for remote support) within 6 ft (two meters) of the unit
◆ Hardware power requirements

“Power Requirements” on page 41 specifies the power requirements for DLm bays.
Physical Planning

Transportation and delivery guidelines

Mode of transport guidelines:

- For a DLm system delivered within the United States or Canada, EMC recommends an air-ride truck. The DLm system is wrapped in custom-designed shipping material, crated, and palletized.

- For a DLm system delivered internationally, EMC recommends shipment by air freight. Unless otherwise instructed, the EMC Traffic Department arranges for delivery directly to the customer’s computer room.

To ensure successful delivery of DLm systems, EMC has formed partnerships with specially selected moving companies. These companies have moving professionals trained in the proper handling of large, sensitive systems. These companies provide the appropriate personnel, floor layouts, and any ancillary moving equipment required to facilitate delivery.

Pre-installation considerations

Install the DLm in a properly equipped and well-ventilated computer room.

Environmental specifications

DLm requires the environmental specifications outlined in “EMC VMAX 20K/VMAX Series Physical Planning Guide [P/N 300-008-601] for information about the VMAX bay” Ensure that the site meets or exceeds the specifications listed for both nonraised floor and raised floor environments.

System host cabling requirements

The Presite Survey, completed with the EMC Systems Engineer, reports the Fibre connection (FICON) cable length required for each host connection to the DLm. From a physical planning perspective, review the routing paths from the hosts to the DLm system. Resolve any physical access issues before the installation day.

Layout and space recommendations

Layout and space considerations are described in “System placement” on page 37.
Physical Planning

When moving the DLm bays down an incline, the rear of the bay must go first and when moving up an incline, the rear of the bay must go last.

Remote support

Remote support is an important and integral part of the EMC customer service and support strategy. Communication between the EMC Customer Support Center and the DLm occurs either through IP connections to the customer's local area network, or through the external serial modem connected to the DLm, which requires customers to provide one dedicated phone line for the modem. You can move phone lines between modems connected to ACPs and Control Stations as needed.

Note: If you elect to use a modem for remote support then EMC recommends that you provide one dedicated phone line for the DLm system to enable ConnectEMC call-homes.

DLm supports one modem in each of its ACPs and Control Stations. “Modems” on page 26 provides more information on the modems DLm8000 supports.

EMC Secure Remote Support

DLm 3.4 and later supports EMC Secure Remote Support (ESRS) Gateway that provides a secure, IP-based, distributed remote service support solution giving you command, control, and visibility of remote support access.

Contact EMC Customer Support to configure ESRS. This is an optional feature.

Planning for upgrades

When planning for upgrades, consider space, power, and environmental concerns.
CHAPTER 2
System Configuration and Host Connectivity

This chapter covers the configurations and host connectivity of the DLm system:

- DLm8000 overview ................................................................. 24
- Installation information............................................................ 26
System Configuration and Host Connectivity

**DLm8000 overview**

A DLm8000 configuration is composed of a VTEC cabinet with tape emulation engines and VDX switches, one VNX VG8 gateway cabinet, one VMAX system bay, and up to 10 VMAX storage bays.

⚠️ **CAUTION**

The DLm8000 VTEC, VNX VG8, and VMAX bay equipment enclosures and power systems are designed to support DLm8000 system equipment only. EMC does not support any other components in these bays, and recommends that you do not install any additional equipment in the DLm8000 bays.

**VTEC bay**

The DLm8000 VTEC bay contains:

- Two ACPs
- Two to eight VTEs
- Two 10 GbE VDX6720 60 port switches
- Two 1 GbE ATI 9924TL 24 port switches
VNX VG8 Bay

The DLm8000 VNX VG8 bay contains:

- One network server (VNX VG8-1) and integrated storage arrays with:
  - One to four Data Mover Enclosures
  - Two to eight Storage Controllers (Data Movers)
  - Two Control Stations
- Two DS-5100B Fibre Channel switches are shipped loose with the system. We recommend they be installed in the VNX cab, just above the control stations. Switch1 should be installed in position 25U in the VNX cab and switch2 should be installed in position 26U in the VNX cab.

Optionally, a second network server (VNX VG8-2) comprising the same fixed and optional components as VNX VG8-1 can be installed. However, DLm 3.4 does not currently support the second VNX VG8.

The DLm8000 VNX VG8 bay has four power zones with independent power cables—one for each side, capable of powering a fully configured bay.

Note: The DLm8000 VNX VG8 cab only needs 2 power drops if the VNX bay has up to 8 Data Movers and 4 power drops if it has 2 fully loaded VG8s.

Chapter 4, “Power Requirements” contains specifications for DLm power requirements.

VMAX system bay and storage bays

EMC Symmetrix VMAX20K/VMAX Series Physical Planning Guide [P/N 300-008-601] provides more information about these components of the DLm8000.

When information about the VMAX components in DLm8000 in that guide differs from this document, follow the information provided in that VMAX Planning Guide.
Modems

DLm8000 ships with a minimum of two modems. Each ACP supports a modem.

In addition, each VNX network server supports two Control Stations and each Control Station supports a modem. So a DLm8000 system with two VNX VG8 network servers supports a total of four modems.

Installation information

Discuss and obtain the following site profile information from the EMC Sales Representative. Table 2 on page 27 lists the external information that is required for configuring DLm systems.

Table 2 External dependencies information

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mainframe software</td>
<td>• Operating system and version number</td>
</tr>
<tr>
<td></td>
<td>• JES2 or JES3</td>
</tr>
<tr>
<td>Channel information</td>
<td>• Channel type</td>
</tr>
<tr>
<td></td>
<td>• Number of channels</td>
</tr>
<tr>
<td></td>
<td>• Type of channels: FICON</td>
</tr>
<tr>
<td>Configuration information</td>
<td>• LPARs which will use DLm</td>
</tr>
<tr>
<td></td>
<td>• Physical Control Unit Address (CUADD)</td>
</tr>
<tr>
<td></td>
<td>• Physical Device Addresses (UNITADD)</td>
</tr>
<tr>
<td></td>
<td>• Device type</td>
</tr>
<tr>
<td></td>
<td>• Device name— logical device name for VTE display</td>
</tr>
<tr>
<td></td>
<td>• Tape volume prefix</td>
</tr>
<tr>
<td>Tape management system information</td>
<td>• Tape management system</td>
</tr>
<tr>
<td></td>
<td>• Version</td>
</tr>
<tr>
<td></td>
<td>• Scratch reports used</td>
</tr>
<tr>
<td>Tape volume information</td>
<td>• Volume serial number range for VTE tapes(^a)</td>
</tr>
<tr>
<td></td>
<td>• Quantity of tape volumes</td>
</tr>
<tr>
<td>Purpose of DLm</td>
<td>• Number of physical drives that will be replaced by virtual tapes</td>
</tr>
<tr>
<td></td>
<td>• Mainframe applications that will access the virtual tapes</td>
</tr>
<tr>
<td></td>
<td>• Backup software that will be used on the VTE</td>
</tr>
</tbody>
</table>

1. DLm can support many such VOLSER ranges.
CHAPTER 3
Physical and Environmental Specifications

This chapter covers the physical and environmental specifications for DLm:

- Physical data ................................................................. 28
- External network and phone line requirements .............. 29
- Environmental specifications ........................................ 32
- Dimensions and service area ....................................... 34
- Shipping dimensions and clearance requirements .......... 35
- System placement ......................................................... 37
Physical data

This section provides the physical data requirements for DLM systems.

DLm8000

DLm8000 has a maximum configuration of one VTEC bay, one VG8 bay, and one VMAX 20K comprised of a System Bay and up to 10 Storage Bays.

When fully configured, the weight of each bay is:

- VTEC bay—1073 lb (487.7 kg)
- VNX VG8 bay with one fully loaded VG8 (8 data movers) and two DS-5100B FC switches. -- 695 lb (315.3 kg)
DLm physical specification for single bay

lists the physical specifications of the VTEC and VG8 bays. The EMC Symmetrix VMAX20K/VMAX Series Physical Planning Guide [P/N 300-008-601] provides the specifications for the VMAX bays.

Table 3 Physical specification of the VTEC and VG8 bays

<table>
<thead>
<tr>
<th>Description</th>
<th>Measurements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>76.66 in (194.7 cm) a</td>
</tr>
<tr>
<td>Width</td>
<td>24.02 in (61.0 cm)</td>
</tr>
<tr>
<td>Depth DLm</td>
<td>41.88 in (106.4 cm)</td>
</tr>
<tr>
<td>Clearance for service and airflow</td>
<td></td>
</tr>
<tr>
<td>Front</td>
<td>42 in (106.7 cm)</td>
</tr>
<tr>
<td>Rear</td>
<td>42 in (106.7 cm)</td>
</tr>
<tr>
<td>Top</td>
<td>18 in (45.7 cm)</td>
</tr>
</tbody>
</table>

External network and phone line requirements

DLm8000

DLm8000 has two ACPs. Each ACP has one two GbE ports to be connected to your organization’s network. These are bonded within each ACP for fail-over. However for maximum availability of network access to the ACPs it is recommended that one port from each ACP is connected to one customer network switch and the other port from each ACP is connected to a different customer network switch. This ensures that failure of one switch does not affect ACP connectivity.

The cables to connect these ports to your network are not supplied with DLm. Therefore, you should provide two network cables to connect the ACP to your network.

DLm8000 provides modems as an optional mechanism for raising service alerts and remote support access. (The preferred mechanism is to use ConnectEMC/ESRS.) DLm8000 has at least two modems - one for each ACP. Each VNX VG8 also has two modems. The VMAX Service Processor also has a modem. You will need to supply at least one dedicated phone line for modem access. You can move phone lines between modems for the ACPs and Control Stations as needed.
Table 4 on page 30 lists the external network and phone line requirements for DLm8000.

Table 4  DLm8000 external network and phone line requirements

<table>
<thead>
<tr>
<th>DLm8000</th>
<th>1 GbE cables (Copper)</th>
<th>Modem</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACP1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>ACP2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>VNX- VG8-1 Control Stations</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>VNX-VG8-2 Control Stations</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>FC switch1 - 1 GbE cable (DS-5100B in VNX cab)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>FC switch2 - 1 GbE cable (DS-5100B in VNX cab)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>VMAX - 1 GbE cable (mgmt station in VMAX system bay)</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Figure 1 on page 31 shows external connections for DLm8000.
Figure 1  External connections for DLm8000
Environmental specifications

Table 5 on page 32 provides the environmental data.

Table 5  DLm environmental data

<table>
<thead>
<tr>
<th>Condition</th>
<th>Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating temperature</td>
<td>50°F – 90°F (10°C to 32°C)</td>
</tr>
<tr>
<td>Operating altitude (at 32°F)</td>
<td>7500 ft (2286 m)</td>
</tr>
<tr>
<td>Operating altitude (maximum)</td>
<td>10,000 ft (3048 m) 1.1°F derating per 1000 ft</td>
</tr>
<tr>
<td>Operating humidity</td>
<td>20% to 80% noncondensing</td>
</tr>
<tr>
<td>Raised floor environment</td>
<td>Recommended but not required</td>
</tr>
</tbody>
</table>

Air flow

Table 6 on page 32 shows environmental requirements for shipping and storage.

Table 6  Environmental requirements for shipping and storage

<table>
<thead>
<tr>
<th>Condition</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-40°F to 149°F (-40°C to 65°C)</td>
</tr>
<tr>
<td>Temperature gradient</td>
<td>43.2°F/hr (24°C/hr)</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>10% to 90% noncondensing</td>
</tr>
<tr>
<td>Maximum altitude</td>
<td>35000 ft (10667.6 m)</td>
</tr>
</tbody>
</table>
Environment acclimation

A DLm system requires time to become acclimated to a computer room environment before and after you unpack it. Before unpacking the unit, allow it to stabilize for 16 hours. After unpacking the unit, do not apply AC power to it for at least the number of hours specified in Table 7 on page 33.

Table 7  Environmental acclimation

<table>
<thead>
<tr>
<th>Transit / storage environment</th>
<th>Hours required before applying power (minimum)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condition</td>
<td>°F</td>
</tr>
<tr>
<td>Nominal</td>
<td>68–72</td>
</tr>
<tr>
<td>Cool/Damp</td>
<td>&lt;68</td>
</tr>
<tr>
<td>Cold/Dry</td>
<td>&lt;68</td>
</tr>
<tr>
<td>Hot/Dry</td>
<td>72–149</td>
</tr>
<tr>
<td>Hot/Humid</td>
<td>72–149</td>
</tr>
<tr>
<td></td>
<td>72–149</td>
</tr>
<tr>
<td></td>
<td>72–149</td>
</tr>
</tbody>
</table>

Note: The system’s environment must have temperature and humidity values that prevent condensation to occur on any system part. Altitude and atmospheric pressure specifications are referenced to a standard day at 58.7°F (14.8°C). Maximum wet bulb temperature is 82°F (28°C).
Physical and Environmental Specifications

Power and cooling data

Table 8 on page 34 provides details of power consumption and heat dissipation for DLm8000 systems.

Table 8  DLm8000 power consumption and heat dissipation

<table>
<thead>
<tr>
<th>System configuration description⁸</th>
<th>Total power consumption</th>
<th>Heat dissipation (Btu/Hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VTEC bay</td>
<td>3.20 kVA</td>
<td>11,000</td>
</tr>
<tr>
<td>VMAX bays</td>
<td>3.47 kVA</td>
<td>10,800</td>
</tr>
<tr>
<td>VNX VG8 bay</td>
<td>5.84 kVA</td>
<td>16,200</td>
</tr>
</tbody>
</table>


Dimensions and service area

Because DLm bays ventilate through the rear, you must provide adequate clearance to service and cool the system, as illustrated in Figure 2 on page 35.

⁸ All VTEC bay values are calculated for a fully loaded configuration. Contact your EMC Sales Representative for specific supported configurations.
Shipping dimensions and clearance requirements

DLm8000 VTEC bays and VNX VG8 bays have the same dimensions. This section provides the dimensions, clearances, and placement of the VTEC and the VG8 bays. See EMC Symmetrix VMAX 20K/VMAX Series Physical Planning Guide for dimensions, clearances and placement of the VMAX bays.

**Note:** Read the entire procedure before unpacking.
Physical and Environmental Specifications

Ensure that your doorways and elevators are adequately wide and tall enough to accommodate the shipping pallet and bay as shown in Figure 3 on page 36.

Figure 3  Shipping dimensions
Use a mechanical lift or pallet jack to position the packaged bay in its final location. Leave approximately 96 in. of clearance at the back of the bay to unload the unit and roll it off the pallet as illustrated in Figure 4 on page 37.

![Figure 4 Unloading the pallet](image)

**System placement**

You can install a DLm system on a solid floor or a raised floor. Although not required, the raised floor environment is preferred.

**DLm8000 configuration floor cutouts**

DLm8000 consists of the following bays:

- A VTEC bay containing the VTEs, ACPs, the 1 GbE switches and the 10 GbE switches
- A VNX VG8 bay that holds a VNX VG8 and two 10 GbE Fibre switches
- VMAX
Figure 5 on page 38 illustrates the configuration and the recommended floor tile cutouts for the the VTEC and VG8 bays. For information on placements for VMAX, refer to the EMC Symmetrix VMAX 20K/VMAX Series Physical Planning Guide [P/N 300-008-601]. The illustrations assume that the floor tiles are 24 x 24 in. (61 x 61 cm).

Figure 5  DLM8000 VTEC and VG8 configuration floor cutout

The VNX bay is cabled to the VTEC bay using 8-meter 1 Gb Ethernet cables and 10-meter fiber optic 10 Gb Ethernet cables. The VNX bay can be up to 5 bays away from the VTEC bay, with the cabling under a raised floor.

For more information on VNX to VMAX distances and distances between various VMAX bays refer to the EMC Symmetrix VMAX 20K/VMAX Series Physical Planning Guide [P/N 300-008-601].
Physical and Environmental Specifications

Anti-tip and anti-move brackets

If you intend to secure additional stabilizer brackets to your site floor, prepare the location for the mounting bolts. (The additional brackets help to prevent the bay from tipping while you service cantilevered levels.) The brackets provide two levels of protection for stabilizing the unit:

- Anti-tip bracket—Use this bracket to provide an extra measure of anti-tip security. One or two kits can be used. For bays with sliding components, two is recommended.

![Diagram of Anti-tip brackets](image)

Figure 6 Rack measurement for anti-tip brackets

All measurements are in inches.
Physical and Environmental Specifications

- Anti-move bracket — Use this bracket to permanently fasten the unit to the floor.

Figure 7  Rack measurements for anti-move brackets

If your system will be secured by one or more of these anti-tip brackets, be sure the bay is in its final location before attaching them. Use the supplied bolts and mounting holes to attach the bracket to the bay and floor. (The additional brackets help to prevent the bay from tipping while you service devices on slide rails.)

The 40U-C cabinet Unpacking and Setup Guide provides information about installing the anti-tip and anti-move brackets.
CHAPTER 4
Power Requirements

This chapter describes the power requirements for the DLm system configurations. The procedures for connecting customer power to the system are also covered.

The major topics are:

◆ DLm power requirements ................................................................. 42
◆ DLm touch current compliance ......................................................... 47
◆ Regulatory compliance ................................................................. 47
◆ Choosing a UPS ........................................................................... 48
Power Requirements

DLm power requirements

This section describes the North American electrical specifications, power cables, connectors, and extension cords for the VTEC and VG8 bays in a DLm configuration. The EMC VMAX 20K/VMAX Series Physical Planning Guide provides further information about power requirements for VMAX system and storage bays.

Table 9 on page 42 summarizes power requirements specific to a single VTEC or VG8 bay.

Table 9 North American, single-phase, electrical specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage</td>
<td>200 V AC to 240 V AC -10%/+10% single-phase</td>
</tr>
<tr>
<td>Frequency</td>
<td>50 Hz to 60 Hz</td>
</tr>
<tr>
<td>Circuit breakers</td>
<td>30 A</td>
</tr>
<tr>
<td>Power zones</td>
<td>Two</td>
</tr>
<tr>
<td>Power requirements at customer site (for each bay)</td>
<td>Two single-phase drops each for: DLm8000 VTEC bay and VNX VG8 bay with up to one fully-loaded VG8 (8 DMs)</td>
</tr>
<tr>
<td>Power distribution panel connectors</td>
<td>NEMA L6-30P Facility power mating receptacle is L6-30R</td>
</tr>
</tbody>
</table>

Before delivery, the customer must supply and install the required receptacles to zone A and zone B power for the DLm bays. Figure 8 on page 43 shows the required power cabling for DLm8000 systems.
VTEC, and VNX bay with one fully configured VG8 (8 DMs)

Figure 8  Power distribution cabling — DLm8000
Power Requirements

Single-phase power extension cords and connectors

Each DLM bay has four single-phase Power Distribution Panel (PDP) assemblies and four Power Distribution Units (PDU).

These bays require two power drops each:

- VTEC bay
- VNX bay with one fully loaded VG8 (8 DMs)

Note: EMC VMAX 20K/VMAX Series Physical Planning Guide provides further information about power requirements for VMAX system and storage bays.

For these bays, the upper PDUs are cabled to the lower PDPs in manufacturing.

VNX bays that are shipped with eight Data Movers are configured as required during initial setup. If it was shipped with less than eight Data Movers and you want to add more to reach eight Data Movers, contact EMC Customer Service for power requirement changes.

Regardless of the number of power drops required, each VTEC and VNX VG8 bay comes with a DLM power kit that includes two 15-foot power cords and two 21-foot power cords. Assuming a raised floor customer setup, the 21-foot cords are used for the two upper PDPs, and the 15-foot cords are used with the two lower PDPs.

Figure 9 on page 45 shows extension cables for North American installations. Connector L6-30R connects to the DLM bay connector L6-30P. Connector L6-30P on the other end of cable connects to a customer-supplied L6-30R. EMC provides similar cable sets with appropriate wiring and couplers for all supported international installations.
Figure 9  EMC model number DLmP40U-60-US cable description

**Figure 10 on page 46** shows the various power cords and connectors.
Power Requirements

### Power

Power cords and connectors depend on the type ordered with your system, and must match the supply receptacles at your site.

<table>
<thead>
<tr>
<th>Power cord connector</th>
<th>Operating voltage/frequency</th>
<th>Service type</th>
<th>Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEMA L6-30P</td>
<td>200-240 V AC 50/60 Hz</td>
<td>30-amp service, single phase</td>
<td>North America, Japan</td>
</tr>
<tr>
<td>IEC-309 32Pc</td>
<td>200-240 V ac 50/60 Hz</td>
<td>32-amp service, single phase</td>
<td>International</td>
</tr>
<tr>
<td>Right Angle</td>
<td>240 V ac 50/60 Hz</td>
<td>32-amp service, single phase</td>
<td>Australia</td>
</tr>
</tbody>
</table>

Each AC circuit requires a source connection that can support a minimum of 4800 VA of single phase, 200-240 V AC input power. For high availability, the left and right sides of any rack or cabinet must receive power from separate branch feed circuits.

**NOTE** Each pair of power distribution panels (PDP) in the 40U-C cabinet can support a maximum of 24 A AC current draw from devices connected to its power distribution units (PDU). Most cabinet configurations draw less than 24 A AC power, and require only two discrete 240 V AC power sources. If the total AC current draw of all the devices in a single cabinet exceeds 24 A, the cabinet requires two additional 240 V power sources to support a second pair of PDPs. Use the published technical specifications and device rating labels to determine the current draw of each device in your cabinet and calculate the total.

Figure 10  Power cords and connectors
DLm touch current compliance

DLm is designated as a fixed (stationary) electrical equipment with high earth-leakage markings. Connect the bays to the customer AC supply with the recommended rated current breakers and the attached cables. “DLm power requirements” on page 42 provides details of recommended circuit breaker ratings. These recommended breaker ratings are based on the maximum kW loading of the bay and not on the kVA figures of a particular configuration. The kVA values listed in this manual are intended for air conditioning and utility loading purposes only. “Power and cooling data” on page 34 contains more information.

**CAUTION**

Do not connect the DLm VTEC bay power supplies on separate Main and Auxiliary circuit panels to differential trip devices. These devices are typically called Ground Fault Circuit Interrupter (GFCI), Ground Fault Interrupter (GFI), Earth Leakage Circuit Breaker (ELCB), or Residual Current Circuit Breakers.

Because DLm systems are high earth-leakage devices, differential trip devices (typically 30 mA) are not recommended due to random activation during utility feed distortions and power line transients interacting with the bay noise filters. These differential devices have trip ratings of 5 mA to 500 mA and are mostly intended for consumer goods rather than fixed devices.

If the DLm bay is correctly grounded to the customer’s AC power source, leakage current will not produce a voltage leading to electrical shock. Serious insulation breakdowns will trip the breakers feeding the bay or, preferably first clear fuses in individual internal modules closest to the fault.

Regulatory compliance

DLm meets regulatory requirements as referenced by the following UL/IEC/EN 60950 3rd Edition:

5.1.7 Equipment with touch (leakage) current exceeding 3.5mA.

For Stationary Permanently Connected Equipment, or Stationary Pluggable Equipment Type B, having a main protective earthing terminal, if the Touch (Leakage) Current measurements exceed 3.5mA r.m.s., following conditions apply:
Power Requirements

- The r.m.s. Protective Conductor Current will not exceed five percent of the input current per line under normal operating conditions. If the load is unbalanced, the largest of the single-phase currents shall be used for this calculation.

  To measure the Protective Conductor Current, the procedure for measuring Touch Current is used, but the measuring instrument is replaced by an ammeter of negligible impedance.

- The cross-sectional area of the Protective Bonding Conductor will not be less than 1.0 mm squared in the path of high Protective Conductor Current.

- A label with similar wording shall be affixed adjacent to the equipment AC MAINS SUPPLY connection:

  HIGH LEAKAGE CURRENT
  Earth connection essential before connecting supply.

The DLm configurations are Stationary Pluggable Type B systems, and the application of the warning label, EMC P/N 046-000-309, are in English and French. The label location for the DLm configuration is on the inside of the front door.

Choosing a UPS

The VTEC and Storage Controllers (Data Movers) are stateless, so no battery backup is required. In the event of a power failure, the Storage Processor writes contents of the write cache to disk, before shutdown. Although DLm does not require a battery backup to ensure data integrity, to avoid potential downtime, purchase a UPS from a qualified vendor.

EMC neither offers nor recommends any specific UPS suppliers or product type to its customers. However, EMC uses preferred suppliers for UPS systems in their facilities. Therefore, if you, the customer, are implementing a UPS, EMC recommends the following:

- When you are planning the UPS solution for a DLm and the host system is presently (or will potentially be) protected with a UPS, the battery backup time you propose for the DLm UPS solution should match that of the host system.

- The DLm requires independent zone B and zone A power feeds for each bay.

- The UPS should be equipped with an internal output isolation transformer.
◆ The UPS should be installed as a separately derived AC source using neutral and ground wiring to preserve the fault tolerance specification of the DLM power system.

◆ Depending on the power requirements for your DLM system operation, an isolation transformer/stabilizer installed in front of the UPS could further buffer the AC utility environmental factors from reaching DLM. To determine if an isolation transformer/stabilizer is needed, consult a licensed electrician.
Power Requirements
CHAPTER 5
Package Removal

This chapter describes the procedures for unpacking and then positioning the DLm cabinets:

- Inspect the system shipment ................................................................. 52
- Unpacking procedure ........................................................................ 52
Package Removal

Inspect the system shipment

Inspect the outer packaging for signs of possible shipping damage. If there is visible damage:

1. Note the damage on the waybill.
2. Photograph the damage.
3. Notify the EMC Traffic department and Customer Support management.
4. File a freight claim with the carrier.

Unpacking procedure

Before unpacking the unit, allow it to stabilize for 16 hours.

⚠️ CAUTION ⚠️

Before moving the unit over a raised floor, ensure that the floor meets the requirements listed under “System placement” on page 37.

Follow these steps to unload and unpack the cabinets:

1. Use a mechanical lift or pallet jack to position the packaged cabinet in its final location.

   Note: Before placing the bays, note the correct placement (based on the overall system configuration) and the floor tile cutouts to place each bay.

   Leave approximately 96 in. of clearance at the back of the cabinet to unload the bay and roll it off the pallet.
2. Remove the shipping material:
   
a. Cut the tape and straps that hold the cardboard carton together as illustrated in Figure 11 on page 53.

![Figure 11](EMC2838)

Figure 11  Cutting the tape and straps

b. Remove the cardboard packing hood and wraparound sleeve as illustrated in Figure 12 on page 54.
c. Cut the wrap strap that secures the plastic shipping bag around the bay.

The 40U-C Cabinet Unpacking and Setup Guide provides information about unpacking and setting up the DLm hardware.

Note: After unpacking the unit, allow it to stabilize in the new environment as specified in “Environment acclimation” on page 33. EMC recommends that you open both the front and the rear doors to facilitate environmental acclimation.
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