Abstract
This document includes installation, configuration, and operation information for the HPE R12000 and R18000 DirectFlow UPS. This document is for the person who installs and maintains power products. Hewlett Packard Enterprise assumes you are qualified in the servicing of high-voltage equipment and trained in recognizing hazards in products with hazardous energy levels.
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**Contents**
Overview

HPE DirectFlow UPS overview

The HPE DirectFlow UPS features a configurable rack-mount design that offers three-phase power protection for loads up to a maximum of 20000 VA/18000 W (these numbers might vary by model). Features include:

- Configurations for extending runtime
  - A configurable power unit with the following rack unit heights:
    - R12000DF—1U
    - R18000DF—2U
  - Optional 3U lead acid or 1U lithium-ion battery packs
  - A minimum of 60 seconds of backup power with one battery pack and 5 minutes of backup power with two battery packs provided for the maximum load

- Advanced battery management to increase battery service life and optimize recharge time
  - Warning before the end of the useful battery life
  - Easily replaceable battery modules that simplify maintenance

- Configurable utility and generator battery charge power level switching

- Optional HPE DirectFlow UPS Management Module network connectivity with advanced remote monitoring, control, and management features

- Built-in location awareness of components

- Emergency shutdown control through a REPO port

- Firmware that is service upgradeable through a standard DB-9 serial communication port

- Backed by worldwide agency approvals

To benefit from product enhancements, update to the latest versions of UPS firmware and software. To download the UPS firmware and software, see the Hewlett Packard Enterprise website (http://www.hpe.com/info/rackandpower).

Power management options

The DirectFlow UPS is comprised of an HPE DirectFlow Power Unit configured with either HPE DirectFlow VRLA Battery Packs (3U) or an R12000DF (1U) or R18000DF (3U) HPE DirectFlow Lithium-ion Battery Pack.

The DirectFlow UPS works within an overall power management plan that can include utility, generator, and battery power.

The power unit includes front panel controls and an LCD screen for navigating UPS menu options (on page 74) to access system values. Certain values can be configured to accommodate your power management plan.

Each battery pack provides a minimum of 60 seconds of backup power as a stopgap for a power supply lag or outage. Depending upon configuration, including the number of battery packs and load requirements, the UPS can extend backup power for an increased amount of time. Distribute the load as evenly as possible across the UPS configuration to most efficiently use the powerful three-phase UPS design.
The UPS modes of operation allow the UPS to transfer seamlessly between AC, Battery, and Bypass modes to supply power to connected devices without interruption. For more information, see "Working with UPS modes of operation (on page 77)." The power unit can use a built-in, time-based algorithm to switch between utility and generator battery charging power levels when transferring operating modes. Using a lower charge level while the UPS runs on generator power maximizes the output available to connected devices. The Management Module provides additional features to receive generator commands. To set UPS battery charge power levels, see "Configuring the battery charge power levels (on page 76)."

Advanced monitoring and management features

The Management Module card reports detailed information to the Management Module web interface where the information is graphically displayed. Many commands and functions can be customized from the interface. Customizable setup options in the UPS Service Menu can also be accessed using the Management Module card. The Management Module is designed specifically for the DirectFlow UPS. It is not intended for installation in other UPS devices.

To install and initially configure the Management Module in the DirectFlow UPS, see "Installing the Management Module card (on page 58)" and "Accessing the Management Module (on page 64)." For details about using the Management Module card and web interface, see the HPE DirectFlow UPS Management Module User Guide on the Hewlett Packard Enterprise website (http://www.hpe.com/support/DFUPS_MM_UG_en).

Location Discovery Services for the UPS configuration

Hewlett Packard Enterprise provides built-in location awareness of rack components, a capability that works hand-in-hand with technology in the new HPE Intelligent Series racks. Together, the technologies provide the rack identification number and precise U location of the components. This information is communicated through power management software.

HPE R12000DF
When the power unit is fully seated within the rack, Discovery Services connectors meet with a rack-mounted EEPROM strip. Discovery Services reports the specific location of the power unit and a calculated location of any battery packs. The battery packs must be installed directly beneath the power unit in the rack, without a U gap, for Discovery Services to locate them. Racks without pre-installed EEPROM strips may be upgraded by ordering and installing the strips, available on the Hewlett Packard Enterprise website (http://www.hpe.com/products/rackoptions).

REPO port

The power unit includes an isolated REPO port. When properly wired, the REPO feature enables the power at the UPS output receptacles to be switched off from a remote location. To use this feature, the REPO port must be connected to a remote, normally open switch (not supplied). The REPO switch is used in conjunction with a main disconnect device that removes the AC source from the input of the power unit.

When the switch is closed:

- The REPO feature immediately powers down protected devices and does not utilize an orderly shutdown procedure.
- The REPO feature shuts down power units operating under utility, generator, or battery power.

To connect a REPO port, see either "Connecting the R12000DF REPO port (on page 50)" or "Connecting the R18000DF REPO port (on page 55)." To restore power to the load devices after the REPO feature has been activated, see "Restoring power after a REPO activation (on page 80)."

Component identification

R12000 DirectFlow UPS

The components in the following sections are found in the R12000 DirectFlow UPS.
## Power unit front panel controls

<table>
<thead>
<tr>
<th>Item</th>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>UPS fault LED</td>
<td>Red light indicates a fault; no light indicates proper function.</td>
</tr>
<tr>
<td>2</td>
<td>Bypass mode LED</td>
<td>Green light indicates Bypass mode; no light indicates AC mode.</td>
</tr>
<tr>
<td>3</td>
<td>Battery mode LED</td>
<td>Yellow light indicates Battery mode; flashing indicates low battery.</td>
</tr>
<tr>
<td>4</td>
<td>Input LED</td>
<td>Green light indicates that the power input is adequate.</td>
</tr>
<tr>
<td>5</td>
<td>Up arrow</td>
<td>Press to scroll up through the menu structure.</td>
</tr>
<tr>
<td>6</td>
<td>Down arrow</td>
<td>Press to scroll down through the menu structure.</td>
</tr>
</tbody>
</table>
| 7    | Off/ESC/Clear fault button | • In AC mode, press the button for 3 seconds to transfer the UPS to Bypass mode; in Battery mode, press for 3 seconds to shut down the UPS output.  
  |              | • During menu selection, press the button to go back to the previous menu.                                                                    |
  |     |                         | • During a UPS fault, press the button for 3 seconds to clear the fault and transfer the UPS to Bypass mode.                                      |
| 8    | On/Enter button         | Press the button for 3 seconds to turn the UPS on; press the button to confirm setup or menu entries.                                           |
Power unit rear panel

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cover plate for option slot</td>
</tr>
<tr>
<td>2</td>
<td>REPO port</td>
</tr>
<tr>
<td>3</td>
<td>DB-9 serial port for flashing UPS firmware</td>
</tr>
<tr>
<td>4</td>
<td>DB-15 port for a CAN Bus cable for battery pack communication</td>
</tr>
<tr>
<td>5</td>
<td>Power cable for connection to the battery pack</td>
</tr>
<tr>
<td>6</td>
<td>Input/output power module connection</td>
</tr>
<tr>
<td>7</td>
<td>Input/output power module connection</td>
</tr>
</tbody>
</table>

Power unit rear panel with components
# R18000 DirectFlow UPS

The components in the following sections are found in the R18000 DirectFlow UPS.

## Overview

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HPE DirectFlow UPS Management Module card</td>
</tr>
<tr>
<td>2</td>
<td>DirectFlow Input/Output Power Module switch</td>
</tr>
<tr>
<td>3</td>
<td>DirectFlow Input/Output Power Module connection and cables</td>
</tr>
</tbody>
</table>

Power unit rear panel with Management Module card

R18000 DirectFlow UPS

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RJ-45 for network or Ethernet communications</td>
</tr>
<tr>
<td>2</td>
<td>DB-9 serial port for configuration and flashing card firmware</td>
</tr>
<tr>
<td>3</td>
<td>Power LED</td>
</tr>
<tr>
<td>4</td>
<td>Health/Alert LED</td>
</tr>
</tbody>
</table>
## Power unit front panel controls

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<td>Up arrow</td>
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<td>6</td>
<td>Down arrow</td>
<td>Press to scroll down through the menu structure.</td>
</tr>
<tr>
<td>7</td>
<td>Off/ESC/Clear fault button</td>
<td>• In AC mode, press the button for 3 seconds to transfer the UPS to Bypass mode; in Battery mode, press for 3 seconds to power down the UPS output. &lt;br&gt; • During menu selection, press the button to go back to the previous menu. &lt;br&gt; • During a UPS fault, press the button for 3 seconds to clear the fault and transfer the UPS to Bypass mode.</td>
</tr>
<tr>
<td>8</td>
<td>On/Enter button</td>
<td>Press the button for 3 seconds to power up the UPS on; press the button to confirm setup or menu entries.</td>
</tr>
</tbody>
</table>
Power unit rear panel

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<td>Input/output power module connection</td>
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<td>Input/output power module connection</td>
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</table>

Power unit rear panel with components
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</tr>
</tbody>
</table>

Power unit rear panel with Management Module card

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<tbody>
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<td>Health/Alert LED</td>
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<td>3</td>
<td>DB-9 serial port for configuration and flashing card firmware</td>
</tr>
<tr>
<td>4</td>
<td>RJ-45 for network or Ethernet communications</td>
</tr>
</tbody>
</table>
1U battery pack rear panel

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Connection for a DC to DC power cable to the power unit</td>
</tr>
<tr>
<td>2</td>
<td>Circuit breaker switch</td>
</tr>
<tr>
<td>3</td>
<td>Connection for a DC to DC power cable to the battery pack</td>
</tr>
<tr>
<td>4</td>
<td>DB-15 ports for CAN Bus cables for battery pack communication</td>
</tr>
</tbody>
</table>

3U battery pack rear panel

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Connection for a DC to DC power cable to the power unit</td>
</tr>
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<td>Item</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
</tr>
<tr>
<td>2</td>
<td>Connection for a DC to DC power cable to the battery pack</td>
</tr>
<tr>
<td>3</td>
<td>DB-15 ports for CAN Bus cables for battery pack communication</td>
</tr>
<tr>
<td>4</td>
<td>Circuit breaker switch</td>
</tr>
</tbody>
</table>

**Power unit and battery pack configurations**

The DirectFlow UPS can be configured in the following ways:

- **DirectFlow power unit without any battery packs**
  
The power unit can work as a standalone line conditioner, or active filter, that mitigates harmonics and power factor for the input AC line that supplies utility or generator power. To set the power unit active current correction (ACC) options, see the "UPS menu options (on page 74)."

  A configuration without battery packs does not supply power for extended runtime.

- **DirectFlow power unit with one battery pack**
  
  - 3U DirectFlow Battery Pack
  
  - 1U DirectFlow Battery Pack
• **DirectFlow power unit with two battery packs in series**
  The battery packs must be the same rack unit height and battery type; for instance, the power unit could connect to a 3U lead acid battery pack connected in series to a 3U lead acid battery pack.
  - Two 3U DirectFlow Battery Packs
  - Two 1U DirectFlow Battery Packs
Installation

Precautions

See the complete regulatory compliance notices in *Safety and Compliance Information for Server, Storage, Power, Networking, and Rack Products* on the Hewlett Packard Enterprise website (http://www.hpe.com/support/Safety-Compliance-EnterpriseProducts). In addition, follow the safety precautions that are specific to this device.

Save these instructions. This document contains important safety instructions that should be followed during installation, operation, and maintenance of the UPS and batteries.

This symbol indicates that the power unit exceeds the recommended weight for one individual to handle safely. Weight for each power unit is:

- R12000DF—16 kg (35.2 lb)
- R18000DF—20.87 kg (46 lb)

**WARNING:** To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manual material handling.

This symbol indicates that the 3U DirectFlow Battery Pack exceeds the recommended weight for one individual to handle safely. **WARNING:** To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manual material handling.

This symbol indicates that the 1U DirectFlow Battery Pack exceeds the recommended weight for one individual to handle safely. **WARNING:** To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manual material handling.

**WARNING:** A risk of personal injury or damage to the equipment exists. Uneven loading of equipment in the rack might cause the rack to become unstable. Install the heavier components first, and then continue to populate the rack from the bottom to the top.

**WARNING:** A risk of personal injury from electric shock and hazardous energy levels exists. The installation of options and routine maintenance and service of this product must be performed by individuals who are knowledgeable about the procedures, precautions, and hazards associated with AC power products.

**WARNING:** Contact with any part of a grounded battery can result in electrical shock. Shock risk is reduced if grounds are removed during installation and maintenance.
## Important device safety information

⚠️ **WARNING:** To reduce the risk of fire, only connect unit input to a circuit provided with branch circuit overcurrent protection for 30 A rating in accordance with the National Electric Code, ANSI/NFPA 70. Disconnect the charging source prior to connecting or disconnecting battery terminals. Determine if the battery is inadvertently grounded. If inadvertently grounded, remove the source from the ground.

⚠️ **CAUTION:** The DirectFlow UPS is intended to supply three-phase linear/PFC loads only.

**IMPORTANT:** The rating label on the device provides the class (A or B) of the equipment. Class B devices have a Federal Communications Commission (FCC) logo or FCC ID on the label. Class A devices do not have an FCC logo or FCC ID on the label. After determining the class of the device, see the complete regulatory compliance notices in *Safety and Compliance Information for Server, Storage, Power, Networking, and Rack Products* on the Hewlett Packard Enterprise website [http://www.hpe.com/support/Safety-Compliance-EnterpriseProducts](http://www.hpe.com/support/Safety-Compliance-EnterpriseProducts).

## Preparing to install the hardware

To prepare for the hardware installation:

1. Ensure the necessary tools and materials (on page 19) are available.
2. Select a site.
3. Ready the equipment for installation in the rack.

### Tools and materials

The following tools are required for installation:

- Phillips screwdriver
- 10-mm hex-nut driver

The following items are supplied with the rack:

- Screws
- Hex nuts
- Cage nuts
- Cage nut-fitting tool

To download the latest software version, see the Hewlett Packard Enterprise website [http://www.hpe.com/info/rackandpower](http://www.hpe.com/info/rackandpower).

Additional materials might be supplied depending upon the optional devices included. For a specific list of materials, see the install card for each device.

### Selecting a site

⚠️ **WARNING:** To prevent fire or electric shock, install the unit in a temperature- and humidity-controlled indoor environment, free of conductive contaminants.

When selecting a site, consider the following factors:
• Elevated operating ambient temperature—If the equipment is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment might be greater than room ambient temperature. Install the equipment in an environment compatible with the operating temperature.

• Reduced air flow—In the rack, the rate of air flow required for safe operation of the equipment must not be compromised.

• Circuit overloading—Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

• Reliable earthing—Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit, such as the use of power strips.

• Electrical requirements—All models require a dedicated (unshared) branch circuit, including an unshared grounding conductor, that is suitably rated for the specific UPS as stated in "UPS input specifications (on page 114)."

Readying the equipment

1. Check the battery recharge date specified on the label that is affixed to the shipping carton.

   **IMPORTANT:** Do not use the battery if the recharge date has passed. If the date on the battery recharge date label has passed without the battery being recharged, contact a Hewlett Packard Enterprise authorized service representative for directions.

2. Transport the packaged unit to its installation location.
3. Unpack the equipment near the rack where the unit will be assembled.

   **CAUTION:** Always plan the rack installation so that the heaviest item is on the bottom of the rack. Install the heaviest item first, and continue to populate the rack from the bottom to the top.

Installing rack rails

**IMPORTANT:** For rack shipping or relocation of any of the components, ensure hex nuts and shipping brackets are used with the rail supports. See the optional shipping steps in the rack rail and component installation sections.

Reinforcement plates are required for rails that support the 2U power unit and 3U battery packs. Plates are not needed for those rails that support the 1U power unit or 1U battery packs.

Installing rack rails for the 1U power unit

**WARNING:** To reduce the risk of personal injury or damage to the equipment, be sure that:

- The leveling feet are extended to the floor.
- The full weight of the rack rests on the leveling feet.
- The stabilizing feet are attached to the rack if it is a single-rack installation.
- The racks are coupled together in multiple-rack installations.
- Only one component is extended at a time. A rack may become unstable if more than one component is extended for any reason.

**IMPORTANT:** Mounting hardware for square- and round-holed racks is included in the battery pack kit.
To install the mounting rails for the 1U DirectFlow Battery Pack:

1. Loosen the wing nuts or hex nuts, and then extend the brackets to the desired length. For rack shipping or relocation, ensure hex nuts are used in the rail supports.

2. Install the screws through the rack into the mounting rail and the front of each mounting bracket.
3. Install cage nuts or clip nuts into the rear of the rack.

4. Do one of the following:
   - For a stationary rack installation, install the screws through the mounting rail into the cage nuts or clip nuts.

⚠️ CAUTION: When shipping or relocating a rack with installed components, always use the shipping bracket to secure the unit.
For rack shipping or relocation, install the shipping brackets at the rear of each rail.

5. Tighten the wing nuts or hex nuts.

Installing rack rails for the 2U power unit

⚠️ **WARNING:** To reduce the risk of personal injury or damage to the equipment, be sure that:
- The leveling feet are extended to the floor.
- The full weight of the rack rests on the leveling feet.
- The stabilizing feet are attached to the rack if it is a single-rack installation.
- The racks are coupled together in multiple-rack installations.
- Only one component is extended at a time. A rack may become unstable if more than one component is extended for any reason.

⚠️ **IMPORTANT:** If preparing the rails for integrated shipping, follow the same instructions as in Installing the power unit (on page 48).
**IMPORTANT:** Mounting hardware for square- and round-holed racks is included in the battery pack kit.

1. Loosen the wing nuts or hex nuts, and then extend the brackets to the desired length.

2. Insert screws through the rack into the mounting rail and the front of each mounting bracket.
3. Install cage nuts or clip nuts into the rear of the rack.

4. Insert screws through the mounting rail into the cage nuts or clip nuts.
5. Tighten the wing nuts or hex nuts.

6. Install the reinforcement plates using hex nuts. Wait until the unit is installed and the brackets are adjusted before tightening the nuts.

Installing rack rails for the 1U battery pack

⚠️ **WARNING:** To reduce the risk of personal injury or damage to the equipment, be sure that:
- The leveling feet are extended to the floor.
- The full weight of the rack rests on the leveling feet.
- The stabilizing feet are attached to the rack if it is a single-rack installation.
- The racks are coupled together in multiple-rack installations.
- Only one component is extended at a time. A rack may become unstable if more than one component is extended for any reason.

⚠️ **IMPORTANT:** Mounting hardware for square- and round-holed racks is included in the battery pack kit.
To install the mounting rails for the 1U DirectFlow Battery Pack:
1. Loosen the wing nuts or hex nuts, and then extend the brackets to the desired length. For rack shipping or relocation, ensure hex nuts are used in the rail supports.

2. Install the screws through the rack into the mounting rail and the front of each mounting bracket.
3. Install cage nuts or clip nuts into the rear of the rack.

4. Do one of the following:
   - For a stationary rack installation, install the screws through the mounting rail into the cage nuts or clip nuts.

⚠️ **CAUTION:** When shipping or relocating a rack with installed components, always use the shipping bracket to secure the unit.
For rack shipping or relocation, install the shipping brackets at the rear of each rail.

5. Tighten the wing nuts or hex nuts.

---

**Installing rack rails for the 3U battery pack**

⚠️ **WARNING:** To reduce the risk of personal injury or damage to the equipment, be sure that:

- The leveling feet are extended to the floor.
- The full weight of the rack rests on the leveling feet.
- The stabilizing feet are attached to the rack if it is a single-rack installation.
- The racks are coupled together in multiple-rack installations.
- Only one component is extended at a time. A rack may become unstable if more than one component is extended for any reason.

⚠️ **IMPORTANT:** Mounting hardware for square- and round-holed racks is included in the battery pack kit.
To install the mounting rails for the 3U DirectFlow Battery Pack:

1. Loosen the wing nuts or hex nuts, and then extend the brackets to the desired length.
   For rack shipping or relocation, ensure hex nuts are used in the rail supports.

2. Install screws through the rack into the mounting rail and the front of each mounting bracket.
3. Install cage nuts or clip nuts into the rear of the rack.

4. Do one of the following:
   - For stationary rack installation, install the screws through the mounting rail into the cage nuts or clip nuts.

⚠️ **CAUTION:** When shipping or relocating a rack with installed components, always use the shipping bracket to secure the unit.
For rack relocation or shipping, install the shipping brackets at the rear of each rail.

5. Tighten the wing nuts or hex nuts.
6. Install the reinforcement plates using hex nuts. Wait until the unit is installed and the brackets are adjusted before tightening the nuts.

Installing battery packs

The HPE DirectFlow Battery Pack can be installed to provide extended run-time. The DirectFlow VRLA Battery Pack (3U) consists of a four-battery string in a 3U chassis. The R12000 and R18000 DirectFlow 1U Lithium-ion Battery Packs consist of an eight lithium-ion battery string in a 1U chassis. Each battery pack can connect directly to a power unit and optionally to another battery pack that is the same battery type and rack unit (U) height. Up to two battery packs can be connected in series.

Before installing any battery packs, see "Powering down the UPS (on page 33)."

Powering down the UPS

To power down an existing UPS configuration that includes battery packs, see "Powering down the UPS and battery packs (on page 80)."

To power down the UPS:
1. Power down all load devices.
2. Press the ESC button for 3 seconds, and then press the Enter button to place the UPS in Bypass mode.
3. Disconnect the power unit from utility power.
4. Wait at least 5 minutes for the UPS internal circuitry to discharge and power down.

Installing the 1U battery pack

Before installing the unit, review and adhere to all warnings provided in "Precautions (on page 18)."

WARNING: To reduce the risk of personal injury or equipment damage due to weight considerations, first load the empty battery pack chassis into the rack, and then install the battery modules in the chassis.

Mount the battery pack directly below the UPS without a U gap.
To install the battery pack:

1. Power down the UPS before installing the battery packs. For more information, see "Powering down the UPS (on page 33)."

2. Install the mounting rails.

3. With one person on each side of the carton, lift the chassis and lower it to the floor in front of the rack.

4. With one person on each side, lift the chassis to rail level and slide the chassis on the mounting rails.

   For shipping or relocating a populated rack, secure the rear of the chassis to the rails by mating the chassis slots to the shipping bracket tabs.

5. Attach the chassis to the rack using the supplied screws.

To complete the installation, see the following instructions:

1. Installing the lithium-ion batteries (on page 35)
2. Attaching the 1U battery pack front bezel (on page 35)
3. Connecting the 1U battery pack to the 1U power unit (on page 35)
4. Connecting the 1U battery pack to the 2U power unit (on page 37)
5. Charging lithium-ion batteries (on page 39)
Installing the lithium-ion batteries

Attaching the 1U battery pack front bezel

Connecting the 1U battery pack to the 1U power unit

**IMPORTANT:** Use only the Phillips 6-32, .375 screws provided in the kit to secure the connection. The UPS does not recognize the battery pack if the screws are not tightened.
To connect the battery pack to the power unit from the rear panels:

1. Switch the circuit breaker on the battery pack left to the Off position.

2. Connect the power cable on the power unit to the power connector on the battery pack, and then secure the cable with the Phillips 6-32, .375 screws.
3. Connect the CAN bus communication cable from the DB-15 connector on the power unit to the DB-15 connector on the battery pack.

4. Switch the circuit breaker on the battery pack right to the On position.

To install a second battery pack that is the same battery type and rack U height:
1. Verify that the circuit breaker on the battery pack is in the left, Off position.
2. Connect the DC to DC power cable from the first battery pack connector to the second battery pack connector.
   
   Up to two packs can be connected to the power unit.
3. Connect the CAN bus communication cable from the first battery pack to the second battery pack.

4. Switch the circuit breaker on the battery pack right to the On position.

The DC to DC power cable is a UPS option required for connecting battery packs; the cable can be ordered on the Hewlett Packard Enterprise website (http://www.hpe.com/info/rackandpower) (part number AF497A).

Connecting the 1U battery pack to the 2U power unit

**IMPORTANT:** Use only the Phillips 6-32, .375 screws provided in the kit to secure the connection. The UPS does not recognize the battery pack if the screws are not tightened.
To connect the battery pack to the power unit from the rear panels:

1. Switch the circuit breaker on the battery pack left to the Off position.

2. Connect the power cable on the power unit to the power connector on the battery pack.
   Pull back the retaining clip next to the power connector on the battery back in order to connect or disconnect the power cable.
3. Connect the CAN bus communication cable from the DB-15 connector on the power unit to the DB-15 connector on the battery pack.

4. Switch the circuit breaker on the battery pack right to the On position.

To install a second battery pack that is the same battery type and rack U height:
1. Verify that the circuit breaker on the battery pack is in the left, Off position.
2. Connect the DC to DC power cable from the first battery pack connector to the second battery pack connector.
   Up to two packs can be connected to the power unit.
3. Connect the CAN bus communication cable from the first battery pack to the second battery pack.

4. Switch the circuit breaker on the battery pack right to the On position.

The DC to DC power cable is a UPS option required for connecting battery packs; the cable can be ordered on the Hewlett Packard Enterprise website (http://www.hpe.com/info/rackandpower) (part number AF497A).

Charging lithium-ion batteries

To connect the power unit to a grounded utility power outlet, see "Installing the R12000DF power module (on page 51)." When the UPS is in AC mode, the power unit automatically begins charging the batteries. Allow the batteries to charge for at least 5 hours.
To extend the useful life of the batteries through good maintenance practices, see "Battery care and storage guidelines (on page 81)."

Installing the 3U battery pack

Before installing the unit, review and adhere to all warnings provided in "Precautions (on page 18)."

**WARNING:** To reduce the risk of personal injury or equipment damage due to weight considerations, first load the empty battery pack chassis into the rack, and then install the battery modules in the chassis.

Mount the battery pack directly below the UPS without a U gap.

To install the battery pack:

1. Install the mounting rails including any reinforcement plates to support the battery packs. For more information, see "Installing rack rails (on page 20)."
2. Power down the power unit before installing the battery packs. For more information, see "Powering down the UPS (on page 33)."
3. With one person on each side of the carton, lift the chassis and lower it to the floor in front of the rack.
4. Install the mounting ears on the chassis using the screws provided.
5. With one person on each side, lift the chassis to rail level and slide the chassis on the mounting rails.
For shipping or relocating a populated rack, secure the rear of the chassis to the rails by mating the chassis slots to the shipping bracket tabs.

6. Attach the chassis to the rack using the supplied screws.

To complete the installation, see the following instructions:
1. Removing the 3U battery bracket (on page 41)
2. Installing the lead acid batteries (on page 42)
3. Replacing the 3U battery bracket (on page 42)
4. Attaching the 3U front bezel (on page 43)
5. Connecting the 3U battery pack to the 1U power unit (on page 43)
6. Connecting the 3U battery pack to the 2U power unit (on page 45)
7. Charging lead acid batteries

Removing the 3U battery bracket
Installing the lead acid batteries

⚠️ **WARNING:** To prevent personal injury, prepare the area and observe all materials-handling procedures when transporting a battery module. Battery modules weigh 20 kg (44 lb).

Replacing the 3U battery bracket
Attaching the 3U front bezel

Connecting the 3U battery pack to the 1U power unit

**IMPORTANT:** Use only the Phillips 6-32, .375 screws provided in the kit to secure the connection. The UPS does not recognize the battery pack if the screws are not tightened.

To connect the battery pack to the UPS from the rear panels:
1. Switch the circuit breaker on the battery pack left to the Off position.
2. Connect the power cable on the UPS to the power connector on the battery pack.

3. Connect the CAN bus communication cable from the DB-15 connector on the UPS to the DB-15 connector on the battery pack.

4. Switch the circuit breaker on the battery pack right to the On position.

To install a second battery pack that is the same battery type and rack U height:

1. Verify that the circuit breaker on the battery pack is in the left, Off position.
2. Connect the DC to DC power cable from the first battery pack connector to the second battery pack connector.
   Up to two packs can be connected to the UPS.
3. Connect the CAN bus communication cable from the first battery pack to the second battery pack.

4. Switch the circuit breaker on the battery pack right to the On position.

The DC to DC power cable is a UPS option required for connecting battery packs. The cable can be ordered on the Hewlett Packard Enterprise website (http://www.hpe.com/info/rackandpower) (part number AF497A).

Connecting the 3U battery pack to the 2U power unit

**IMPORTANT:** Use only the Phillips 6-32, .375 screws provided in the kit to secure the connection. The UPS does not recognize the battery pack if the screws are not tightened.
To connect the battery pack to the UPS from the rear panels:

1. Switch the circuit breaker on the battery pack left to the Off position.

2. Connect the power cable on the UPS to the power connector on the battery pack.
3. Connect the CAN bus communication cable from the DB-15 connector on the UPS to the DB-15 connector on the battery pack.

4. Switch the circuit breaker on the battery pack right to the On position.

To install a second battery pack that is the same battery type and rack U height:
1. Verify that the circuit breaker on the battery pack is in the left, Off position.
2. Connect the DC to DC power cable from the first battery pack connector to the second battery pack connector.
   
   Up to two packs can be connected to the UPS.
3. Connect the CAN bus communication cable from the first battery pack to the second battery pack.

4. Switch the circuit breaker on the battery pack right to the On position.
The DC to DC power cable is a UPS option required for connecting battery packs. The cable can be ordered on the Hewlett Packard Enterprise website (http://www.hpe.com/info/rackandpower) (part number AF497A).

Charging lead acid batteries

To connect the power unit to a grounded utility power outlet, see "Installing the R18000DF power module (on page 57)." When the UPS is in AC mode, the power unit automatically begins charging the batteries. Allow the UPS batteries to charge for 24 hours.

For more information on extending the useful life of the batteries through good maintenance practices, see "Battery care and storage guidelines (on page 81)."

Installing the power unit

The power unit can be installed with either an R12000DF or an R18000DF configuration.

Installing the R12000DF power unit

Before installing the unit, review and adhere to all warnings provided in "Precautions (on page 18)."

To install the power unit in the rack:

1. Install the mounting rails.

   **CAUTION:** When shipping or relocating a rack with installed components, always use the shipping bracket to secure the unit.

   For shipping or relocation, secure the rear of the power unit to the rails using the shipping brackets. Be sure that each shipping bracket overlaps the corresponding tab on the power unit chassis.

2. With one person on each side of the carton, lift the chassis and lower it to the floor in front of the rack.
3. Install the mounting ears on the chassis using the screws provided.

4. With one person on each side, lift the chassis to rail level and slide the chassis on the mounting rails.

5. Attach the chassis to the rack using the supplied screws.
Attaching the power unit front bezel

Connecting the R12000DF REPO port

⚠️ **WARNING:** To meet the requirements stated in NEC (NFPA 70) Articles 645-10 and 645-11, a UPS installed in a computer equipment room must be connected to a REPO circuit.

⚠️ **IMPORTANT:** The remote switch must be in the Off (open) position to enable power to the output receptacles.

Separate wire pairs should be attached to a single, normally open contact in a parallel connection. Hewlett Packard Enterprise recommends these practices:

- Choose different colors for the positive and negative wires.
- Use stranded, non-shielded wire (AWG #22 - #18, or the equivalent).
- Wire the connector block before powering up the power unit to avoid unintentionally tripping the power unit.
• Secure the REPO wires tightly to the rack and the rear of the power unit with tie wraps and tie wrap blocks after installing the power unit in the rack.

Connecting the R12000DF serial communications port
To flash the UPS firmware, or to communicate with another device, connect a computer interface cable between the power unit serial communications port and the serial port on a host computer or device.

Installing the R12000DF power module
When configuring a 1U power unit and the DirectFlow Input/Output Power Module with a 1U battery pack, install the power unit and the power module above the battery pack.
To install the power module in the power unit:

1. Connect the power module, and then tighten the screws.

2. Install the hold down bracket, and then tighten the screws.
3. Ensure that the switch is in the normal, down position.

Before connecting any devices to the UPS, see "Connecting devices (on page 58)."

Installing the R18000DF power unit

Before installing the unit, review and adhere to all warnings provided in "Precautions (on page 18)."

To install the power unit in the rack:

1. Install the mounting rails.

   **CAUTION:** When shipping or relocating a rack with installed components, always use the shipping bracket to secure the unit.

   For shipping or relocation, attach the shipping brackets at the rear of each rail.

2. With one person on each side of the carton, lift the chassis and lower it to the floor in front of the rack.
3. Install the mounting ears on the chassis using the screws provided.

4. With one person on each side, lift the chassis to rail level and slide the chassis on the mounting rails. For shipping or relocation, secure the rear of the power unit to the rails using the shipping brackets. Be sure that each shipping bracket overlaps the corresponding tab on the power unit chassis.

5. Attach the chassis to the rack using the supplied screws.
Attaching the power unit front bezel

Connecting the R18000DF REPO port

**WARNING:** To meet the requirements stated in NEC (NFPA 70) Articles 645-10 and 645-11, a UPS installed in a computer equipment room must be connected to a REPO circuit.

**IMPORTANT:** The remote switch must be in the Off (open) position to enable power to the output receptacles.

Separate wire pairs should be attached to a single, normally open contact in a parallel connection. Hewlett Packard Enterprise recommends these practices:

- Choose different colors for the positive and negative wires.
- Use stranded, non-shielded wire (AWG #22 - #18, or the equivalent).
- Wire the connector block before powering up the power unit to avoid unintentionally tripping the power unit.
Secure the REPO wires tightly to the rack and the rear of the power unit with tie wraps and tie wrap blocks after installing the power unit in the rack.

Connecting the R18000DF serial communications port

To flash the UPS firmware, or to communicate with another device, connect a computer interface cable between the power unit serial communications port and the serial port on a host computer or device.
Installing the R18000DF power module

To install the DirectFlow Input/Output Power Module in the power unit:

1. Connect the power module, and then tighten the screws.

2. Ensure that the switch is in the normal, down position.

Connecting the UPS to utility power

⚠️ WARNING: To prevent injury from electric shock or damage to the equipment:
- Plug the input line cord into a grounded (earthed) electrical outlet that is installed near the equipment and is easily accessible.
- Do not disable the grounding plug on the input line cord. The grounding plug is an important safety feature.
- Do not use extension cords.

Connect the power unit to a grounded utility power outlet.
Connecting devices

⚠️ **CAUTION:** Do not plug laser printers into the UPS output receptacles. The instantaneous current drawn by this type of printer can overload the UPS.

⚠️ **CAUTION:** The DirectFlow UPS is intended to supply three-phase linear/PFC loads only.

Before connecting load devices to the UPS, verify the following:

- The ratings of the devices that will be connected do not exceed the UPS capacity, which will overload the UPS.
  
  If the equipment rating is listed in amps, multiply the number of amps by the selected output voltage to determine the VA.

- The load devices are linear/PFC loads

After verification, connect the device power cords to the UPS output receptacles.

Starting power to the load

Start power to the load by placing the UPS in AC mode.

⚠️ **IMPORTANT:** AC power must be available the first time the UPS is started.

Continuing the installation of components

HPE DirectFlow Battery Packs and the HPE DirectFlow UPS Management Module card can be installed for extended run-time and advanced battery management. To install these components, see the following instructions:

- Installing battery packs (on page 33)
- Installing the Management Module card (on page 58)

For instructions about testing the REPO port function, see "Verifying the REPO port connection (on page 80)."

Installing the Management Module card

The HPE DirectFlow UPS Management Module web interface allows remote monitoring and control of the HPE DirectFlow Power Unit, HPE DirectFlow UPS Management Module card, and any HPE DirectFlow Battery Packs installed in the configuration. Power usage information is accessed through the network connector located on the front of the HPE DirectFlow UPS Management Module card. Multiple devices can monitor the UPS over the network connection. The Management Module card is designed specifically for the power unit. It is not intended for installation in other UPS devices.

For information about configuring access from the HPE DirectFlow UPS Management Module card to the web interface, see "Accessing the Management Module (on page 64)."

For more information about accessing, signing in, and configuring the web interface software, see the HPE DirectFlow UPS Management Module User Guide on the Hewlett Packard Enterprises website (http://www.hpe.com/support/DFUPS_MM_UG_en).

Installing the Management Module card in the 1U power unit
**IMPORTANT:** It is not necessary to power down the UPS before installing the Management Module card.

To install the card in the UPS:

1. Remove the two screws securing the cover plate on the power unit, and then slide the plate out.

2. Install the Management Module card along the alignment channels in the option slot.

3. If the UPS is powered up, check that the Management Module card is seated properly and receiving power by verifying that the card's Power LED light is illuminated solid green.
Connecting the serial communications cable in the 1U power unit

Connect the serial port to configure or flash Management Module card firmware or to communicate to another local device.

For the initial setup of the UPS DirectFlow Management Module web interface access to the management module card, use a local host computer or device connected to the serial communication port. For details, see "Accessing the Management Module (on page 64)."

Connecting the network cable to the 1U power unit

Connect the Management Module card to a network or Internet connection with an RJ-45 Ethernet cable.

A network-connected computer can be used to login to the Management Module web interface for remote access to the Management Module card and to view information about the DirectFlow UPS. To access the Management Module web interface, see "Accessing the Management Module (on page 64)."

Installing the Management Module card in the 2U power unit
IMPORTANT: It is not necessary to power down the UPS before installing the Management Module card.

To install the card in the UPS:

1. Remove the two screws securing the cover plate on the power unit, and then slide the plate out.

2. Install the Management Module card along the alignment channels in the option slot.

3. If the UPS is powered up, check that the Management Module card is seated properly and receiving power by verifying that the card's Power LED light is illuminated solid green.
Connecting the serial communications cable in the 2U power unit

Connect the serial port to configure or flash Management Module card firmware or to communicate to another local device.

For the initial setup of the UPS DirectFlow Management Module web interface access to the management module card, use a local host computer or device connected to the serial communication port. For details, see "Accessing the Management Module (on page 64)."

Connecting the network cable to the 2U power unit

Connect the Management Module card to a network or Internet connection with an RJ-45 Ethernet cable.

A network-connected computer can be used to log in to the Management Module web interface for remote access to the Management Module card and to view information about the DirectFlow UPS. To access the Management Module web interface, see "Accessing the Management Module (on page 64)."
Checking the Health/Alert LED

If the Health/Alert LED illuminates red or flashes red, see "Troubleshooting (on page 90)" for more information.
Accessing the Management Module

A local connection to the HPE DirectFlow UPS Management Module card is required the first time for initial configuration.

To access the HPE DirectFlow UPS Management Module locally:

1. Install the Management Module card in the power unit.
   a. Connect the serial communications cable to a local host computer or device. For more information, see "Connecting the serial communications cable in the 1U power unit (on page 60)" or "Connecting the serial communications cable in the 2U power unit (on page 62)."
   b. Connect the network cable to the Internet or network. For more information, see "Connecting the network cable to the 1U power unit (on page 60)" or "Connecting the network cable to the 2U power unit (on page 62)."

2. Launch a terminal emulation program. For more information, see "Launching a terminal emulation program (on page 64)."
   The POST executes on the session screen. For details about the information output by POST, see "POST (on page 65)."

3. Record the IPv4 or IPv6 address for the Management Module card from the POST.

4. At the prompt, press any key within 5 seconds to access and configure the Management Module Service Menu (on page 66).
   -or-
   Launch a telnet session to access and configure the Service Menu. For more information, see "Launching a telnet session (on page 65)."

To prepare for remote access:

1. Access the Service Menu to configure the Management Module card for remote access.

2. Launch a web browser on a network-connected computer or device and sign into the Management Module web interface. For more information, see "Launching a web browser (on page 71)" and "Signing into the Management Module web interface (on page 72)."

Launching a terminal emulation program

HyperTerminal is the serial communication program provided with Microsoft Windows and is used in this section as an example for setting up a terminal emulation session. If you are using another utility, the steps might be different.

To launch a terminal emulation program:

1. On the host computer or device, click Start, and select Programs>Accessories>Communications>HyperTerminal.
   The Connection Description window appears.

2. Enter a description, select an icon for the connection, and then click OK. The Connect To window appears.

3. Select the serial connector on the host computer to which the DB-9 cable is attached, and then click OK. The COM Properties window appears.

4. Select the following parameter values, and then click OK.
   - Bits per second—115,200
o Data bits—8
o Parity—None
o Stop bits—1
o Flow control—None

POST

When the card is powered up or reset, the boot loader performs a POST and outputs the following text.

IRQ test: PASS
Serial loopback test: PASS
HPE DirectFlow UPS Management Module

NETWORK INTERFACE PARAMETERS:
IP address: 16.83.130.246
Subnet mask: 255.255.255.0
Default gateway: 16.83.130.1

HARDWARE PARAMETERS:
Module Serial number: 1US2010015
MAC address: 44:1E:A1:D1:02:14

Press any key in 5 seconds to enter the Service menu.

If an error is detected in the boot process, the Health/Alert LED illuminates or flashes. To correct the error, see "Updating the UPS firmware (on page 79)" or "Troubleshooting (on page 90)."

To access a list of commands, open Help. Enter `info` or `vers` to display information such as IP address, model and serial number, and version numbers for specific firmware.

Launching a telnet session

To launch a telnet session to access the Management Module Service Menu (on page 66):

1. Enter the following command at a DOS prompt or the command line:
   
   Telnet `xxx.xxx.xxx.xxx`
   
   where `xxx.xxx.xxx.xxx` is the IP address of the management module.

2. At the prompt, enter the user name and password.
   
   The default user name is `admin`, and the default password is `admin`.

Navigating the Service Menu

The Management Module Service Menu provides an alternative, limited interface to the Management Module card during initial setup and when the web interface is disabled or not preferred. The menu structure textually displays measurements, warnings, and alarm messages from the Management Module card. Some setup options and system values can be configured through the Service Menu and sent to the Management Module web interface.

All status information included in the Management Module Service Menu is also available by signing into the Management Module web interface (on page 72).

To navigate the Service Menu:

1. Enter the corresponding option number at the prompt to open a submenu.
2. Follow the on-screen prompts to enter or change configuration information.
3. Enter 0 at the submenu prompt to go to the previous menu.
   
   Or, enter 0 at the main menu prompt to exit the utility.
4. Press the Enter key to refresh the screen. The Management Module card resets automatically to allow configuration changes to take effect.

Service Menu

This menu only appears when accessing the Management Module card using a terminal emulation program.

<table>
<thead>
<tr>
<th>Option number</th>
<th>Submenu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Module Configuration</td>
<td>Opens the Module Configuration submenu (on page 66)</td>
</tr>
<tr>
<td>2</td>
<td>Exit</td>
<td>Exits the Service Menu and resets the Management Module card</td>
</tr>
</tbody>
</table>

Module Configuration submenu

The Module Configuration submenu opens when Module Configuration is selected from the terminal emulation Service Menu or when the telnet session is launched to access the Management Module card.

<table>
<thead>
<tr>
<th>Option number</th>
<th>Submenu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>System Information</td>
<td>Displays information about the power unit, battery packs, and Input/Output Power Module</td>
</tr>
<tr>
<td>2</td>
<td>System Setup</td>
<td>Sets the date, time, and daylight saving time parameters</td>
</tr>
<tr>
<td>x</td>
<td>Exit Without Saving</td>
<td>Exits a menu without saving the changes</td>
</tr>
<tr>
<td>s</td>
<td>Save New Changes and Restart</td>
<td>Saves changes and resets the Management Module card</td>
</tr>
<tr>
<td>d</td>
<td>Restore Configuration to Factory Defaults</td>
<td>Restores all parameters to default settings</td>
</tr>
</tbody>
</table>

System Information submenu

Each System Information submenu has the Refresh Data option to obtain the current status of the unit.
### System Setup submenu

<table>
<thead>
<tr>
<th>Option number</th>
<th>Submenu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>User Accounts</td>
<td>Enters or changes user account parameters</td>
</tr>
<tr>
<td>2</td>
<td>Network</td>
<td>Displays the Network submenu to change network properties for the Management Module card</td>
</tr>
<tr>
<td>3</td>
<td>Remote Management</td>
<td>Displays the Remote Management submenu to change remote settings</td>
</tr>
<tr>
<td>4</td>
<td>UPS Management</td>
<td>Displays the UPS Management submenu</td>
</tr>
<tr>
<td>0</td>
<td>Previous Menu</td>
<td>Returns to the previous menu</td>
</tr>
</tbody>
</table>

### User Accounts submenu

<table>
<thead>
<tr>
<th>Option number</th>
<th>Submenu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1-5)</td>
<td>Entry</td>
<td>Change an entry for user login names, passwords, or administrator privileges</td>
</tr>
<tr>
<td>0</td>
<td>Previous Menu</td>
<td>Returns to the previous menu</td>
</tr>
</tbody>
</table>

### Network submenu

<table>
<thead>
<tr>
<th>Option number</th>
<th>Submenu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>IPV4 Network Settings</td>
<td>Enters or changes the IPV4 network properties for the Management Module card</td>
</tr>
<tr>
<td>2</td>
<td>IPV6 Network Settings</td>
<td>Enters or changes the IPV4 network properties for the Management Module card</td>
</tr>
<tr>
<td>3</td>
<td>Date/Time Configuration</td>
<td>Configures the date and time</td>
</tr>
<tr>
<td>0</td>
<td>Previous Menu</td>
<td>Returns to the previous menu</td>
</tr>
</tbody>
</table>

### IPV4 and IPV6 Network Settings submenus

<table>
<thead>
<tr>
<th>Option number</th>
<th>Submenu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Static Address</td>
<td>Sets the Management Module card IP address</td>
</tr>
<tr>
<td>2</td>
<td>Static Subnet Mask</td>
<td>Sets the Management Module card subnet mask</td>
</tr>
<tr>
<td>3</td>
<td>Static Gateway</td>
<td>Sets the Management Module card default gateway</td>
</tr>
<tr>
<td>4</td>
<td>Toggle Boot Mode</td>
<td>Toggles the boot mode between DHCP and Static IP</td>
</tr>
<tr>
<td>5</td>
<td>Ping Utility</td>
<td>Pings the Management Module web interface</td>
</tr>
<tr>
<td>0</td>
<td>Previous Menu</td>
<td>Returns to the previous menu</td>
</tr>
</tbody>
</table>

### Date/Time Configuration submenu

<table>
<thead>
<tr>
<th>Option number</th>
<th>Submenu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Network Time Protocol</td>
<td>Enables you to configure the date and time using NTP</td>
</tr>
<tr>
<td>2</td>
<td>Manual Date/Time</td>
<td>Enables you to configure the date and time manually</td>
</tr>
<tr>
<td>3</td>
<td>Daylight Saving Changes</td>
<td>Enables you to configure daylight saving time parameters</td>
</tr>
<tr>
<td>Option number</td>
<td>Submenu</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>--------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>0</td>
<td>Previous Menu</td>
<td>Returns to the previous menu</td>
</tr>
</tbody>
</table>

**Network Time Protocol submenu**

<table>
<thead>
<tr>
<th>Option number</th>
<th>Submenu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Primary NTP Server</td>
<td>Enables you to enter or change the IP address of the primary NTP server</td>
</tr>
<tr>
<td>2</td>
<td>Secondary NTP Server</td>
<td>Enables you to enter or change the IP address of the secondary NTP server</td>
</tr>
<tr>
<td>3</td>
<td>GMT Offset (time zone)</td>
<td>Enables you to select the time zone from the table provided</td>
</tr>
<tr>
<td>4</td>
<td>Update Frequency (1–24 hours)</td>
<td>Enables you to enter the number of hours that should pass between each date and time update</td>
</tr>
<tr>
<td>5</td>
<td>NTP Client</td>
<td>Enables you to enable or disable the NTP client</td>
</tr>
<tr>
<td>6</td>
<td>Accept Changes</td>
<td>Enables you to save all changes</td>
</tr>
<tr>
<td>0</td>
<td>Previous Menu</td>
<td>Returns to the previous menu</td>
</tr>
</tbody>
</table>

**Manual Date/Time submenu**

<table>
<thead>
<tr>
<th>Option number</th>
<th>Submenu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Change Date</td>
<td>Enables you to enter or change the date manually</td>
</tr>
<tr>
<td>2</td>
<td>Change Time</td>
<td>Enables you to enter or change the time manually</td>
</tr>
<tr>
<td>0</td>
<td>Previous Menu</td>
<td>Returns to the previous menu</td>
</tr>
</tbody>
</table>

**Daylight Saving Changes submenu**

<table>
<thead>
<tr>
<th>Option number</th>
<th>Submenu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Enable/Disable Daylight Saving Time</td>
<td>Enables you to enable or disable daylight saving time</td>
</tr>
<tr>
<td>2</td>
<td>Change Time Offset</td>
<td>Enables you to configure the amount of time the clock should change for daylight saving time in your region</td>
</tr>
<tr>
<td>3</td>
<td>Change Daylight Saving Time Start</td>
<td>Enables you to configure the day and time that daylight saving should start</td>
</tr>
<tr>
<td>4</td>
<td>Change Daylight Saving Time End</td>
<td>Enables you to configure the day and time that daylight saving should end</td>
</tr>
<tr>
<td>0</td>
<td>Previous Menu</td>
<td>Returns to the previous menu</td>
</tr>
</tbody>
</table>

**Remote Management submenu**

<table>
<thead>
<tr>
<th>Option number</th>
<th>Submenu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SNMP</td>
<td>Configures SNMP managers and SNMP traps</td>
</tr>
<tr>
<td>2</td>
<td>FTP</td>
<td>Enables or disables the FTP service</td>
</tr>
<tr>
<td>3</td>
<td>Emails</td>
<td>Configures a mail server and email event notifications</td>
</tr>
<tr>
<td>4</td>
<td>Session Settings</td>
<td>Configures timeouts and retries for remote sessions</td>
</tr>
<tr>
<td>5</td>
<td>Web Access</td>
<td>Enters or changes parameters for web interface access</td>
</tr>
<tr>
<td>Option number</td>
<td>Submenu</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>--------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>6</td>
<td>Remote Console</td>
<td>Enters or changes parameters for telnet access</td>
</tr>
<tr>
<td>0</td>
<td>Previous Menu</td>
<td>Returns to the previous menu</td>
</tr>
</tbody>
</table>

**SNMP submenu**

<table>
<thead>
<tr>
<th>Option number</th>
<th>Submenu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Remote Console</td>
<td>Enters or changes parameters for telnet access</td>
</tr>
<tr>
<td>0</td>
<td>Previous Menu</td>
<td>Returns to the previous menu</td>
</tr>
</tbody>
</table>

**SNMP Managers (NMS) submenu**

<table>
<thead>
<tr>
<th>Option number</th>
<th>Submenu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SNMP Managers (NMS)</td>
<td>Enables you to select an entry to configure the SNMP managers (computers that use the HPE Power MIB to request information from the management module)</td>
</tr>
<tr>
<td>2</td>
<td>SNMP Traps</td>
<td>Enables you to select an entry to configure the SNMP traps receiver</td>
</tr>
<tr>
<td>0</td>
<td>Previous Menu</td>
<td>Returns to the previous menu</td>
</tr>
</tbody>
</table>

**SNMP Traps submenu**

<table>
<thead>
<tr>
<th>Option number</th>
<th>Submenu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Trap Receiver IP Address</td>
<td>Enables you to enter or change the IP address of a server that should receive SNMP traps</td>
</tr>
<tr>
<td>2</td>
<td>Trap Community String</td>
<td>Enables you to enter or change the community strings of a server that should receive SNMP traps</td>
</tr>
<tr>
<td>3</td>
<td>Enable/Disable Trap</td>
<td>Enables or disables an SNMP traps receiver</td>
</tr>
<tr>
<td>0</td>
<td>Previous Menu</td>
<td>Returns to the previous menu</td>
</tr>
</tbody>
</table>

**SNMP submenu**

<table>
<thead>
<tr>
<th>Option number</th>
<th>Submenu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SNMP Managers (NMS)</td>
<td>Enables you to select an entry to configure the SNMP managers (computers that use the HPE Power MIB to request information from the management module)</td>
</tr>
<tr>
<td>2</td>
<td>SNMP Traps</td>
<td>Enables you to select an entry to configure the SNMP traps receiver</td>
</tr>
<tr>
<td>0</td>
<td>Previous Menu</td>
<td>Returns to the previous menu</td>
</tr>
</tbody>
</table>
## Emails submenu

<table>
<thead>
<tr>
<th>Option number</th>
<th>Submenu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Change SMTP Settings</td>
<td>Enables you to enter or change SMTP settings in the SMTP Settings submenu (on page 70)</td>
</tr>
<tr>
<td>2</td>
<td>Edit An Entry</td>
<td>Enables you to edit an email recipient entry on the Email Recipient submenu (on page 70)</td>
</tr>
<tr>
<td>0</td>
<td>Previous Menu</td>
<td>Returns to the previous menu</td>
</tr>
</tbody>
</table>

### SMTP Settings submenu

<table>
<thead>
<tr>
<th>Option number</th>
<th>Submenu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SMTP Server</td>
<td>Enables you to enter or change the mail server IP address</td>
</tr>
<tr>
<td>2</td>
<td>Sender Email</td>
<td>Enables you to enter or change the email address that messages are marked as being sent from</td>
</tr>
<tr>
<td>0</td>
<td>Previous Menu</td>
<td>Returns to the previous menu</td>
</tr>
</tbody>
</table>

### Email Recipient submenu

<table>
<thead>
<tr>
<th>Option number</th>
<th>Submenu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Receiver Email</td>
<td>Enables you to enter or change an email address that should receive email alert notifications</td>
</tr>
<tr>
<td>2</td>
<td>Enable/Disable Email</td>
<td>Enables or disables the receiver of email alert notifications</td>
</tr>
<tr>
<td>0</td>
<td>Previous Menu</td>
<td>Returns to the previous menu</td>
</tr>
</tbody>
</table>

### Session Settings submenu

<table>
<thead>
<tr>
<th>Option number</th>
<th>Submenu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Session Inactivity Timeout</td>
<td>Enables you to enter the number of minutes the Management Module web interface should wait before terminating an inactive session</td>
</tr>
<tr>
<td>2</td>
<td>Login Retries</td>
<td>Enables you to enter the number of times a user can unsuccessfully log in to the Management Module web interface before the account is locked</td>
</tr>
<tr>
<td>3</td>
<td>Lock-out Period (After x Retries)</td>
<td>Enables you to enter the number of minutes to wait between an unsuccessful login and a new login attempt</td>
</tr>
<tr>
<td>4</td>
<td>Reset Login Retry Count For All Users</td>
<td>Enables you to reset all locked out sessions</td>
</tr>
<tr>
<td>0</td>
<td>Previous Menu</td>
<td>Returns to the previous menu</td>
</tr>
</tbody>
</table>

### Web Access submenu

<table>
<thead>
<tr>
<th>Option number</th>
<th>Submenu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Enable/Disable Web Access</td>
<td>Turns web access on or off</td>
</tr>
<tr>
<td>2</td>
<td>HTTP/HTTPS Configuration</td>
<td>Configures the port for HTTP or HTTPS</td>
</tr>
<tr>
<td>0</td>
<td>Previous Menu</td>
<td>Returns to the previous menu</td>
</tr>
</tbody>
</table>
Remote Console submenu

<table>
<thead>
<tr>
<th>Option number</th>
<th>Submenu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Protocol Selection</td>
<td>Enables you to select telnet</td>
</tr>
<tr>
<td>2</td>
<td>Telnet Configuration</td>
<td>Enables you to configure the port for telnet</td>
</tr>
<tr>
<td>0</td>
<td>Previous Menu</td>
<td>Returns to the previous menu</td>
</tr>
</tbody>
</table>

Configuring the Management Module card for remote access

Use the Management Module Service Menu to configure the minimum settings required to access the Management Module card remotely using the web interface. You can configure other settings using this utility in conjunction with a terminal emulation program.

The IP address assigned to the Management Module card must be fixed. If the IP address changes:

- The UPS loses communication with the Management Module web interface.
- You can lose track of the Management Module card URL.

To configure the Management Module network parameters:

1. If your network is configured with a DHCP server, the network settings are automatically assigned. Verify and note the assigned values.
2. If your network is not configured with a DHCP server:
   a. On the Main menu, enter 1 at the prompt to open Module Configuration submenu.
   b. Enter 2 at the prompt to enter the Network Configuration submenu.
   c. Enter 1 at the prompt to enter the Network Settings submenu.
   d. In the Network Settings submenu, change the mode used to acquire a network IP address to static IP.

You can also change the IP address, subnet mask, and default gateway of the Management Module card.

Launching a web browser

To launch a web browser to access the Management Module web interface:

1. If necessary, configure the Management Module card by:
   a. Launching a terminal emulation program (on page 64).
   b. Configuring the Management Module card for remote access (on page 71).
2. Launch a supported browser.
3. In the browser Address field (Microsoft Internet Explorer) or the Location field (Mozilla and Firefox), enter:

   \[
   \text{http://xxx.xxx.xxx.xxx} \quad \text{or} \quad \text{https://xxx.xxx.xxx.xxx}
   \]
   where xxx.xxx.xxx.xxx is the IPv4 or IPv6 address of the Management Module card. The login screen appears.
4. Sign in through the web browser.

For a complete list of the browser requirements, see "Web interface requirements (on page 72)."
Web interface requirements

The following table lists the minimum requirements necessary to operate the web interface.

<table>
<thead>
<tr>
<th>OS running Windows</th>
<th>Browser</th>
<th>Browser version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows XP</td>
<td>Internet Explorer</td>
<td>8</td>
</tr>
<tr>
<td>Windows Server 2003</td>
<td>Internet Explorer</td>
<td>8</td>
</tr>
<tr>
<td>Windows Vista</td>
<td>Internet Explorer</td>
<td>8</td>
</tr>
<tr>
<td>Windows Server 2008</td>
<td>Internet Explorer</td>
<td>8</td>
</tr>
<tr>
<td>Windows 7</td>
<td>Internet Explorer</td>
<td>8</td>
</tr>
<tr>
<td>Windows 7</td>
<td>Internet Explorer</td>
<td>9</td>
</tr>
<tr>
<td>Win Server 2008 R2</td>
<td>Internet Explorer</td>
<td>9</td>
</tr>
<tr>
<td>Win Vista SP2</td>
<td>Internet Explorer</td>
<td>9</td>
</tr>
<tr>
<td>Windows Server 2008 SP2</td>
<td>Internet Explorer</td>
<td>9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OS running Linux</th>
<th>Browser</th>
<th>Browser version</th>
</tr>
</thead>
<tbody>
<tr>
<td>RHEL 6.3</td>
<td>Firefox</td>
<td>10.0.5</td>
</tr>
<tr>
<td>RHEL 5.8</td>
<td>Firefox</td>
<td>3.6.26</td>
</tr>
<tr>
<td>SLES 10 SP4</td>
<td>Firefox</td>
<td>3.6.13</td>
</tr>
<tr>
<td>SLES 11 SP2</td>
<td>Firefox</td>
<td>10</td>
</tr>
<tr>
<td>HP-UX</td>
<td>Firefox</td>
<td>3.5.9</td>
</tr>
</tbody>
</table>

Signing into the Management Module web interface

To sign in to the Management Module web interface:

1. Enter the user name in the **User Name** field. The default user name is **admin**.
2. Enter the password in the **Password** field. The default password is **admin**.
   Passwords are case-sensitive.
3. Click **Sign In**. The HPE DirectFlow UPS Management Module web interface appears.
   -or-
   Click **Clear** to clear the credentials.

The web interface graphically displays various measurements and warning and alarm messages from the Management Module card. Also, system values and power fail settings can be configured through the web interface and sent to the Management Module card.

**Configuring the power unit**

Configure the power unit for options such as utility and generator power levels and usage, SNMP traps, testing parameters, date and time, display language, and machine functions using the front panel controls for the UPS operations (on page 74).
UPS operations

Navigating UPS menu options

To navigate the options menu using the power unit front panel controls and LCD screen:

- Press the Up or Down arrow to activate the menu options.
- Press the Up or Down arrow to scroll to a menu or option.
- Press the Enter button to enter a submenu or select a specific option.
- Press the ESC button to cancel or return to the previous menu.

The control panel automatically dims after a long period of inactivity. Press any button to restore the screen. To view the complete menu structure, see "UPS menu options (on page 74)."

UPS menu options

<table>
<thead>
<tr>
<th>Main menu</th>
<th>Submenu</th>
<th>Display information or menu option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPS Status</td>
<td>Current Setting</td>
<td>VOUT_SET=480V-Y</td>
<td>Output voltage setting of wiring type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I/O Module: AF486A 480V NEMAL22</td>
<td>Input/output power module type</td>
</tr>
<tr>
<td></td>
<td>Battery Status</td>
<td>VBAT=xxxV, xxx%, Boost</td>
<td>Battery voltage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BP=LA_3U, 2</td>
<td>Battery pack type</td>
</tr>
<tr>
<td></td>
<td>Service Life Time</td>
<td>xxxxxDAYS xxHOURS</td>
<td>Period that UPS has already operated</td>
</tr>
<tr>
<td>Event Log</td>
<td>xx-DD/MM/YYYY HH:MM Alarm 1</td>
<td>—</td>
<td>Date, time, and type of a current alarm</td>
</tr>
<tr>
<td>Measurements</td>
<td></td>
<td>—</td>
<td>Measurements display</td>
</tr>
<tr>
<td>Test/Reset</td>
<td>Test Battery</td>
<td>Press Enter for yes, or ESC for no</td>
<td>Runs a battery test</td>
</tr>
<tr>
<td></td>
<td>Clear Event Log</td>
<td>Press Enter for yes, or ESC for no</td>
<td>Clears the event log</td>
</tr>
<tr>
<td></td>
<td>Test Display</td>
<td>In progress</td>
<td>Tests the display</td>
</tr>
<tr>
<td></td>
<td>Set Factory Default</td>
<td>Press Enter for yes, or ESC for no</td>
<td>Resets to the factory default settings</td>
</tr>
<tr>
<td></td>
<td>Reset Batt Forecast</td>
<td>Press Enter for yes, or ESC for no</td>
<td>Resets the battery forecast parameter</td>
</tr>
<tr>
<td>Settings</td>
<td>Language</td>
<td>English*</td>
<td>Language displayed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>French</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td></td>
<td>German</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Italian</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Spanish</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Date &amp; Time</td>
<td>DD/MM/YYYY hh:mm</td>
<td>Baseline date and time of UPS</td>
</tr>
<tr>
<td>Main menu</td>
<td>Submenu</td>
<td>Display information or menu option</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>---------</td>
<td>------------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td></td>
<td>Backlight Off After</td>
<td>None</td>
<td>Time before display backlight shuts off</td>
</tr>
<tr>
<td></td>
<td>Battery Test Period</td>
<td>No Test</td>
<td>Period of time for running automatic battery test</td>
</tr>
<tr>
<td></td>
<td>Battery Test Period</td>
<td>7 Days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Battery Test Period</td>
<td>14 Days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Battery Test Period</td>
<td>30 Days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Battery Test Period</td>
<td>60 Days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Battery Test Method</td>
<td>Energy Recycle</td>
<td>Battery test runs in AC mode</td>
</tr>
<tr>
<td></td>
<td>Battery Test Method</td>
<td>To Battery Mode*</td>
<td>Battery test runs in Battery mode</td>
</tr>
<tr>
<td></td>
<td>Power On</td>
<td>Automatically*</td>
<td>UPS turns on with AC power input</td>
</tr>
<tr>
<td></td>
<td>Power On</td>
<td>By On key</td>
<td>UPS turns on by pressing On button</td>
</tr>
<tr>
<td></td>
<td>Start-up Delay</td>
<td>Random*</td>
<td>Random startup delay</td>
</tr>
<tr>
<td></td>
<td>Start-up Delay</td>
<td>xxxxxms</td>
<td>Timed startup delay</td>
</tr>
<tr>
<td></td>
<td>Recovery Delay</td>
<td>Random*</td>
<td>Random recovery delay</td>
</tr>
<tr>
<td></td>
<td>Recovery Delay</td>
<td>xxxxxms</td>
<td>Timed recovery delay</td>
</tr>
<tr>
<td></td>
<td>Delay Charge</td>
<td>None*</td>
<td>No delay for charging batteries</td>
</tr>
<tr>
<td></td>
<td>Delay Charge</td>
<td>xxxxxxx</td>
<td>Timed delay for charging batteries</td>
</tr>
<tr>
<td></td>
<td>Function Of Machine</td>
<td>UPS*</td>
<td>Unit functions with battery backup</td>
</tr>
<tr>
<td></td>
<td>Function Of Machine</td>
<td>ACC Only</td>
<td>Unit functions as an active current conditioner without battery backup</td>
</tr>
<tr>
<td></td>
<td>Load Level For ACC</td>
<td>Always on</td>
<td>Active current correction on</td>
</tr>
<tr>
<td></td>
<td>Load Level For ACC</td>
<td>xxx%*</td>
<td>Active current correction percentage of load</td>
</tr>
<tr>
<td></td>
<td>Load Level For ACC</td>
<td>Always off</td>
<td>Active current correction off</td>
</tr>
<tr>
<td></td>
<td>Charger Limit Gen</td>
<td>1100W</td>
<td>Charger limit while on generator</td>
</tr>
<tr>
<td></td>
<td>Charger Limit Gen</td>
<td>555W</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Charger Limit Gen</td>
<td>190W</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Charger Limit Gen</td>
<td>No Charge*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Charger Limit-Uti</td>
<td>1100W</td>
<td>Charger limit while on utility power</td>
</tr>
<tr>
<td></td>
<td>Charger Limit-Uti</td>
<td>555W*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Charger Limit-Uti</td>
<td>190W</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Charger Limit-Uti</td>
<td>No Charge</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Free Run Frequency</td>
<td>60Hz*</td>
<td>Run frequency in AC mode</td>
</tr>
<tr>
<td></td>
<td>Free Run Frequency</td>
<td>50Hz</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Input Source</td>
<td>Util Only</td>
<td>AC input from utility power source only</td>
</tr>
<tr>
<td></td>
<td>Input Source</td>
<td>Util &amp; Gen*</td>
<td>AC input from utility and generator power sources</td>
</tr>
<tr>
<td>Main menu</td>
<td>Submenu</td>
<td>Display information or menu option</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------------</td>
<td>-------------------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>—</td>
<td>On-Gen Duration</td>
<td>30 min*</td>
<td>Time period that unit uses generator power settings</td>
</tr>
<tr>
<td>—</td>
<td>—</td>
<td>1 hr</td>
<td>—</td>
</tr>
<tr>
<td>—</td>
<td>—</td>
<td>2 hr</td>
<td>—</td>
</tr>
<tr>
<td>—</td>
<td>—</td>
<td>4 hr</td>
<td>—</td>
</tr>
<tr>
<td>—</td>
<td>Run Time Limitation</td>
<td>Yes</td>
<td>Enable the maximum battery run time limitation</td>
</tr>
<tr>
<td>—</td>
<td>—</td>
<td>No*</td>
<td>—</td>
</tr>
<tr>
<td>Identification</td>
<td>PU P/N:</td>
<td>—</td>
<td>Power unit model</td>
</tr>
<tr>
<td>—</td>
<td>PU S/N:</td>
<td>—</td>
<td>Power unit serial number</td>
</tr>
<tr>
<td>—</td>
<td>PU SYS FW:</td>
<td>—</td>
<td>Power unit system firmware version</td>
</tr>
<tr>
<td>—</td>
<td>PU PWR FW:</td>
<td>—</td>
<td>Power unit power firmware version</td>
</tr>
<tr>
<td>—</td>
<td>BP1 P/N:</td>
<td>—</td>
<td>Battery pack 1 model (closest to power unit)</td>
</tr>
<tr>
<td>—</td>
<td>BP1 S/N:</td>
<td>—</td>
<td>Battery pack 1 serial number</td>
</tr>
<tr>
<td>—</td>
<td>BP1 FW:</td>
<td>—</td>
<td>Battery pack 1 firmware version</td>
</tr>
<tr>
<td>—</td>
<td>BP2 P/N:</td>
<td>—</td>
<td>Battery pack 2 model</td>
</tr>
<tr>
<td>—</td>
<td>BP2 S/N:</td>
<td>—</td>
<td>Battery pack 2 serial number</td>
</tr>
<tr>
<td>—</td>
<td>BP2 FW:</td>
<td>—</td>
<td>Battery pack 2 firmware version</td>
</tr>
</tbody>
</table>

* An asterisk indicates the factory default setting.

**Configuring the battery charge power levels**

Different battery charge power levels can be set in the power unit for utility and generator input sources. A higher charge power level like 1100 W or 550 W can be set for utility input, and a lower charge level, 190 W or 0 W, can be set for generator input to reserve AC power for loads while running on generator input. By default, the power unit uses a built-in algorithm to determine when to switch battery charge power levels. For instance, when there is a power outage the UPS transfers from AC mode to Battery mode. If the input AC becomes available before 10 seconds or after 60 seconds, the power unit automatically remains at the charge power level defined for utility input. However, if the input AC becomes available again between 10 and 60 seconds, the power unit switches to the battery charge power level defined for generator input. The power unit remains at the generator charge power level until the defined on-generator time period expires, and then the power unit switches back to the charge power level defined for utility input.

To set the power unit battery charge power levels from the Settings menu:

1. Select **Input source**, scroll to **Utility & Gen**, and then press Enter.
   
   **Utility & Gen** is the default setting. To disable the built-in algorithm, select **Utility Only**.

2. Select **Charger Limit-Gen**, scroll to the wattage, and then press Enter.
   
   The default charger limit wattage setting is 0 W.

3. Select **Charger Limit-Uti**, scroll to the wattage, and then press Enter.
   
   The default charger limit wattage setting is 555 W.

4. Select **On-Gen Duration**, scroll to the time period, and then press Enter.
   
   The default on-generator duration is 30 minutes.
The Management Module can override the default settings for charge power level switching by initiating an immediate switch to the generator charge power level if the Management Module receives a SNMP request with an on-generator command from a generator system. The on-generator command must be received within 15 minutes of the AC input power becomes available again or the power unit will use the default time periods. The power unit will switch back to the utility charge power level either after an off-generator command is received or after the defined on-generator period of time expires. To set up the Management Module to receive generator commands, see the HPE DirectFlow UPS Management Module User Guide.

Changing the language

To change the display language on the power unit:

1. Scroll through the main menu and select **Settings**.
2. Select **Language**.
3. Press the **Up** or **Down** arrow to scroll to the language.
4. Press the **Enter** button to save the change.

Working with UPS modes of operation

The UPS modes of operation result from current operating conditions and the parameters that provide power protection to connected load devices. Some mode options can be set or adjusted using the UPS menu options (on page 74).

The UPS has the following modes of operation:

- AC mode (on page 77)
- Battery mode (on page 77)
- Bypass mode (on page 78)

**AC mode**

When the UPS operates in AC mode:

- Power is available at the UPS receptacles.
- The power unit actively filters and mitigates harmonics and power factor.
- The power unit charges the batteries as necessary.
- The UPS transfers to Battery mode (on page 77) or Bypass mode (on page 78) as necessary.

An audible buzzer sounds briefly to indicate the UPS is powering up when the power unit is connected to utility power. If no utility power is available, the UPS might enter Battery mode.

**Battery mode**

When another power source is unavailable, the UPS automatically operates on battery power in Battery mode:

- Power is available at the UPS receptacles for a minimum of 60 seconds per battery pack.
- The UPS automatically transfers back to AC mode (on page 77) when that input is available again.

To turn the UPS completely off from Battery mode, press the **Off** button for 3 seconds.
Bypass mode

The UPS automatically enters Bypass mode when one of the following conditions occurs:

- Extended overload
- Over temperature
- Output short
- Hardware failure

In Bypass mode, utility power continues to be passively filtered by the UPS. To troubleshoot operating problems or conditions that might transfer the UPS into Bypass mode, see "Troubleshooting (on page 90)." To transfer from Bypass mode to AC mode (on page 77) after any operating problems are resolved, press the On button for 3 seconds.
Updating the UPS firmware

Download the DirectFlow Upgrade Utility (Upgrade_HP_v00_1b_b11282013.exe) from the Hewlett Packard Enterprise website (http://www.hpe.com/info/rackandpower).

To update the UPS firmware:

1. From AC mode, move the CAM switch on the power module to the Bypass setting.
2. Connect a local host computer or device to the power unit serial communications port. For more information, see either "Connecting the R12000DF serial communications port (on page 51)" or "Connecting the R18000DF serial communications port (on page 56)."
3. Launch the utility.
4. Click Upgrade Now.
   If you receive an error, verify the UPS is in Bypass mode.
5. From Bypass mode, move the CAM switch on the power module to the AC setting.

By default, all UPS components except the Management Module card are flashed during the upgrade. For more information about using a utility to update or configure the Management Module card, see the HPE DirectFlow UPS Management Module User Guide.
Restoring power after a REPO activation

**IMPORTANT:** If the UPS was operating on battery power when the remote switch was closed, no power is available to the load devices until utility power is restored and the UPS has been manually powered up.

To restore power to the load devices after the REPO feature is activated:
1. Connect the REPO port. To connect a REPO port for an R12000DF power unit, see "Connecting the R12000DF REPO port (on page 50)." To connect a REPO port for an R18000DF power unit, see "Connecting the R18000DF REPO port (on page 55)."
2. Press the On button after the AC source is reconnected to the UPS.

**IMPORTANT:** Pressing and holding the On button without utility present normally initiates a battery start and the UPS assumes the load. If the On button is pressed and a REPO is detected, the battery start is inhibited and the UPS is not able to assume the load. The electronics module fan spins and the UPS fault LED and an audible alarm is active as long as the On button is held.

To power down the entire network in the event of an emergency, the REPO ports of multiple power units can be connected to a single switch.

Verifying the REPO port connection

**IMPORTANT:** While testing, operate connected equipment in a safe test mode so the effects do not disrupt critical operations.

Verify the connection after connecting the REPO port:
1. Initiate a REPO by closing the REPO contact.

**CAUTION:** If the polarity is reversed while connecting the REPO port, the UPS powers up normally.
2. Verify proper connection of the REPO port:
   a. Press the On button to power up the UPS.
   b. Disconnect the REPO port.
   c. Reconnect the REPO port.
      If the polarity is correct, the REPO connectors can be disconnected, and then reconnected, without initiating a REPO.
   d. Verify that the UPS remains in AC mode (on page 77).
   e. If a REPO is initiated, the polarity is reversed. Check and correct the connections.

Powering down the UPS and battery packs

To power down the UPS:
1. Power down all load devices.
2. Press the Esc button for 3 seconds, and then press the Enter button to place the UPS in Bypass mode.
3. Disconnect the power unit from utility power.
4. Wait at least 60 seconds for the UPS internal circuitry to discharge and power down.
5. If battery packs are installed, turn the circuit breaker switches left to the Off positions.
Replacing the batteries

To replace the batteries:

1. Read and observe the requirements in "Important battery safety information (on page 81)" and "Battery care and storage guidelines (on page 81)."
2. Follow the instructions in "Battery replacement procedure (on page 81)."

Important battery safety information

See the complete regulatory compliance notices in Safety and Compliance Information for Server, Storage, Power, Networking, and Rack Products on the Hewlett Packard Enterprise website (http://www.hpe.com/support/Safety-Compliance-EnterpriseProducts). In addition, follow the safety precautions that are specific to this device.

Replace all battery modules at the same time with the same type of batteries originally installed in the battery pack.

Battery care and storage guidelines

Hewlett Packard Enterprise recommends the following care and storage practices:

- Keep the area around the UPS clean and dust-free.
  If the environment is very dusty, clean the outside of the UPS regularly with a vacuum cleaner.
- Maintain the ambient temperature at 25°C (77°F).
- If storing a UPS for an extended period, recharge the batteries every 6 months.
  a. Connect the power unit to utility power.
  b. Allow the UPS to charge the batteries to 100% capacity.
  c. Update the battery recharge date label.

⚠️ CAUTION: Because of the short shelf life of the batteries, avoid storing a battery spare as a backup. Do not maintain an inventory of spare batteries on site unless a procedure to keep these batteries charged while in storage is implemented.

Battery replacement procedure

To ensure confidence and meet expectation of the UPS performance, Hewlett Packard Enterprise recommends replacing the battery at the service life point of 3 years for the 3U lead acid batteries and 4 years for 1U lithium-ion batteries.

Factors that affect battery service life include operating temperature, the depth and frequency of battery discharges, and charging control. Battery performance also slightly degrades later in the battery service life.

Replacing lead acid battery modules

All four 3U battery modules must be replaced at the same time.
To remove the batteries from the battery pack:

1. Remove the front bezel.

2. Remove the battery bracket.
3. Remove the battery modules.

To replace the component, reverse the removal procedure.

**IMPORTANT:** Charge the lead acid batteries for at least 24 hours before supplying backup power to devices. The batteries charge to:
- 80 percent capacity within 3 hours
- 100 percent capacity within 24 hours

### Replacing lithium-ion battery modules

To remove the batteries from the battery pack:

1. Remove the front bezel.
2. Remove the battery modules.

To replace the component, reverse the removal procedure.

**IMPORTANT:** Charge the lithium-ion batteries for at least 5 hours before supplying backup power to devices. The batteries charge to 100 percent capacity within 5 hours.

**IMPORTANT:** Lithium-ion batteries in excess of 100 Wh are classified as Class 9 Dangerous Goods and must be packaged and shipped in accordance with International or domestic regulations. For more information, see the special handling instructions that are required for returning the lithium-ion battery modules that were provided in the spare lithium-ion battery module spare kit.

### Replacing the 1U battery pack

To remove the 1U battery pack:

1. Power down the UPS and battery packs. For more information, see "Powering down the UPS and battery packs (on page 80)."

   Do not remove the battery pack when the UPS is in Battery mode.

2. Disconnect all cabling.

3. Remove the lithium-ion battery modules from the battery pack. For more information, see "Replacing lithium-ion battery modules (on page 83)."
4. Remove the screws securing the battery pack, disengage any shipping brackets from the rear of the battery pack, and then slide the module out.

To replace the battery pack, see "Installing battery packs (on page 33)."

Replacing the 3U battery pack

To remove the 3U battery pack:
1. Power down the UPS and battery packs. For more information, see "Powering down the UPS and battery packs (on page 80)."
   Do not remove the battery pack when the UPS is in Battery mode.
2. Disconnect all cabling.
3. Remove the lead acid battery modules from the battery pack. For more information, see "Replacing lead acid battery modules (on page 81)."
4. Remove the screws securing the battery pack, disengage any shipping brackets from the rear of the battery pack, and slide the module out.
Replacing the Management Module card

To remove the Management Module card, slide the card out of the option slot in the power unit.

Replacing the power module

To remove the power module from the power unit:

1. Power down the UPS and any battery packs. For more information, see "Powering down the UPS and battery packs (on page 80)."
2. Turn the switch clockwise to the left, Bypass position.
3. Loosen the four screws.
4. Disconnect the unit, and then remove the module from the power unit.
To replace the R12000DF power module, see "Installing the R12000DF power module (on page 51)."
To replace the R18000DF power module, see "Installing the R18000DF power module (on page 57)."

Replacing the 1U power unit

To remove the power unit:

1. Power down the UPS and any battery packs. For more information, see "Powering down the UPS and battery packs (on page 80)."
2. Remove the Input/Output Power Module. For more information, see "Replacing the power module (on page 86)."
3. Disconnect all cables attached to the power unit connectors.
4. Remove the front bezel from the power unit.

5. Remove the screws securing the power unit, disengage any shipping brackets from the rear of the power unit, and then slide the module out.

To replace the power module, see "Installing the R12000DF power unit (on page 48)."
IMPORTANT: Replacing the power unit might require power management software to be restarted or reconfigured.

Replacing the 2U power unit

To remove the power unit:

1. Power down the UPS and any battery packs. For more information, see "Powering down the UPS and battery packs (on page 80)."

2. Remove the Input/Output Power Module. For more information, see "Replacing the power module (on page 86)."
   Slide the power module away from the power unit. Temporarily attach the power module to the battery pack by inserting screws on the power module into empty holes on the top of the battery pack. Tighten the screws slightly to secure the power module to the battery pack.

3. Disconnect all cables attached to the power unit connectors.

4. Remove the front bezel from the power unit.
5. Remove the screws securing the power unit, disengage any shipping brackets from the rear of the power unit, and then slide the module out.

To replace the power module, see "Installing the R18000DF power unit (on page 53)."

**IMPORTANT:** Replacing the power unit might require power management software to be restarted or reconfigured.
Troubleshooting

LED and audible alarm troubleshooting

The DirectFlow UPS is designed for durable, automatic operation and also to alert you whenever potential operating problems might occur. The alarms do not necessarily mean that the output power is affected; instead, they are often preventive alarms intended to alert you of a possible condition. An operating problem might trigger the following activity:

- An audible alarm announced by a buzzer in the power unit
- LEDs illuminating, flashing, or not illuminating on the control panel
- Alarm descriptions that appear on the LCD screen
- Alarm entries or related event entries that appear on the Alarms screen or the Event Log screen of the Management Module web interface

The following table describes typical alarms and conditions that are accompanied by LED behavior on the power unit front panel.

<table>
<thead>
<tr>
<th>LED</th>
<th>LED status</th>
<th>Alarm type</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPS fault LED</td>
<td>Solid red light indicates a UPS fault</td>
<td>Long buzzer (5 sec)</td>
</tr>
<tr>
<td>Bypass mode LED</td>
<td>Solid green light indicates the UPS is in Bypass mode</td>
<td>none</td>
</tr>
<tr>
<td>Battery mode LED</td>
<td>• Solid yellow light indicates the UPS is in Battery mode</td>
<td>• Short buzzer (.1 sec) upon entering Battery mode or low battery status</td>
</tr>
<tr>
<td></td>
<td>• Flashing yellow light indicates low battery condition</td>
<td>• Long buzzer upon transferring out of Battery mode (5 sec) or low battery condition (1 sec)</td>
</tr>
<tr>
<td>Input LED</td>
<td>No light indicates utility power is out of operating range</td>
<td>none</td>
</tr>
<tr>
<td>Power LED (on Management Module card)</td>
<td>No light indicates the card is not active</td>
<td>none</td>
</tr>
<tr>
<td>Health/Alert LED (on Management Module card)</td>
<td>Red light indicates an error in the card boot process</td>
<td>none</td>
</tr>
</tbody>
</table>

The alarm descriptions table describes typical alarms and conditions that appear on the power unit front panel LCD screen in the UPS event log. If an alarm appears with a service code, see "Accessing Hewlett Packard Enterprise Support Standards ("Accessing Hewlett Packard Enterprise Support" on page 120)."

To check the event log for a list of active alarms:
1. Press the Enter button on the front panel display to activate the menu options.
2. Press the down arrow button until the Event Log menu appears.
3. Press the **Enter** button to display the list of alarms and conditions.

### Alarm descriptions and SNMP trap codes

The following table describes power unit alarms and indicates the associated trap codes used by the Management Module.

<table>
<thead>
<tr>
<th>Trap code</th>
<th>Alarm name</th>
<th>Alarm description</th>
<th>Alarm type</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Test trap</td>
<td>This alarm is used for testing traps.</td>
<td>Test trap</td>
</tr>
<tr>
<td>1</td>
<td>Charger fault</td>
<td>The charger voltage or current is out of the valid charger threshold.</td>
<td>Critical</td>
</tr>
<tr>
<td>2</td>
<td>Fan fault</td>
<td>A fan is locked or abnormal.</td>
<td>Critical</td>
</tr>
<tr>
<td>3</td>
<td>Over temperature 1</td>
<td>The charger temperature exceeded the limit.</td>
<td>Critical</td>
</tr>
<tr>
<td>4</td>
<td>Over temperature 2</td>
<td>The D2D temperature exceeded the limit.</td>
<td>Critical</td>
</tr>
<tr>
<td>5</td>
<td>Over temperature 3</td>
<td>The inverter temperature exceeded the limit.</td>
<td>Critical</td>
</tr>
<tr>
<td>6</td>
<td>Over temperature 4</td>
<td>The bypass SCR temperature exceeded the limit.</td>
<td>Critical</td>
</tr>
<tr>
<td>7</td>
<td>Over temperature 5</td>
<td>The ambient temperature exceeded the limit.</td>
<td>Critical</td>
</tr>
<tr>
<td>8</td>
<td>Over temperature 6</td>
<td>The 1U battery pack cell temperature exceeded the limit during charging.</td>
<td>Critical</td>
</tr>
<tr>
<td>9</td>
<td>Over temperature 7</td>
<td>The 1U battery pack charger temperature exceeded the limit.</td>
<td>Critical</td>
</tr>
<tr>
<td>10</td>
<td>Over temperature 8</td>
<td>The 1U battery pack MOSFET switches temperature exceeded the limit.</td>
<td>Critical</td>
</tr>
<tr>
<td>11</td>
<td>Over temperature 9</td>
<td>The 1U battery pack cell temperature exceeded the limit during discharging.</td>
<td>Critical</td>
</tr>
<tr>
<td>12</td>
<td>DC bus high/low</td>
<td>The DC bus voltage is less than or greater than the valid temperature.</td>
<td>Critical</td>
</tr>
<tr>
<td>13</td>
<td>Soft-start fault</td>
<td>The +/- DC bus voltage cannot be boosted to the default level.</td>
<td>Critical</td>
</tr>
<tr>
<td>14</td>
<td>Bus OVP</td>
<td>The DC bus exceeded the voltage upper threshold.</td>
<td>Critical</td>
</tr>
<tr>
<td>15</td>
<td>Power DSP fault</td>
<td>The power DSP crashed.</td>
<td>Critical</td>
</tr>
<tr>
<td>16</td>
<td>Inverter fault</td>
<td>There is a fault in the inverter circuit.</td>
<td>Critical</td>
</tr>
<tr>
<td>17</td>
<td>DC AUX power fault</td>
<td>There is a fault in the DC auxiliary power circuit.</td>
<td>Critical</td>
</tr>
<tr>
<td>18</td>
<td>AC AUX power fault</td>
<td>There is a fault in the AC auxiliary power circuit.</td>
<td>Critical</td>
</tr>
<tr>
<td>19</td>
<td>Input volt not OK</td>
<td>The utility voltage is out of the usable voltage range.</td>
<td>Critical</td>
</tr>
<tr>
<td>20</td>
<td>Input freq not OK</td>
<td>The utility frequency is out of the usable frequency range.</td>
<td>Critical</td>
</tr>
<tr>
<td>21</td>
<td>On battery</td>
<td>The UPS is operating in battery discharging mode.</td>
<td>Critical</td>
</tr>
<tr>
<td>22</td>
<td>On bypass</td>
<td>The UPS is not powered on and the output is supplied by utility directly.</td>
<td>Critical</td>
</tr>
<tr>
<td>23</td>
<td>Bypass fault</td>
<td>There is a fault in the bypass SCR circuit.</td>
<td>Critical</td>
</tr>
<tr>
<td>24</td>
<td>Output fault</td>
<td>There is a fault in the inverter SCR circuit.</td>
<td>Critical</td>
</tr>
<tr>
<td>25</td>
<td>Output overload</td>
<td>Load levels are at, or exceeded, the overload threshold.</td>
<td>Critical</td>
</tr>
<tr>
<td>26</td>
<td>Output short</td>
<td>The output is shorted.</td>
<td>Critical</td>
</tr>
<tr>
<td>27</td>
<td>Low battery</td>
<td>Battery time remaining is lower than the battery low warning level defined for the UPS.</td>
<td>Critical</td>
</tr>
<tr>
<td>28</td>
<td>Battery bad</td>
<td>A battery inside the battery pack is aging or abnormal.</td>
<td>Critical</td>
</tr>
<tr>
<td>29</td>
<td>REPO initiated</td>
<td>The external REPO contacts on the power unit have been activated.</td>
<td>Critical</td>
</tr>
<tr>
<td>Trap code</td>
<td>Alarm name</td>
<td>Alarm description</td>
<td>Alarm type</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>30</td>
<td>DB missing</td>
<td>The distribution box (input/output power module) was not connected to the power unit or the signal was lost.</td>
<td>Critical</td>
</tr>
<tr>
<td>31</td>
<td>BM missing</td>
<td>A battery module is missing.</td>
<td>Critical</td>
</tr>
<tr>
<td>32</td>
<td>Battery low shutdown</td>
<td>Shut down the power unit due to low batteries.</td>
<td>Critical</td>
</tr>
<tr>
<td>33</td>
<td>Overload shutdown</td>
<td>Shut down the power unit due to overload.</td>
<td>Critical</td>
</tr>
<tr>
<td>34</td>
<td>Wiring fault</td>
<td>The input wiring of the 3-phase power unit is not correct.</td>
<td>Critical</td>
</tr>
<tr>
<td>35</td>
<td>Attach &gt; 2 BP</td>
<td>More than two battery packs are connected to the same power unit.</td>
<td>Warning</td>
</tr>
<tr>
<td>36</td>
<td>Not same BP type</td>
<td>Two different battery pack types are connected to the same power unit.</td>
<td>Warning</td>
</tr>
<tr>
<td>37</td>
<td>BP not compatible</td>
<td>The firmware version of a battery pack is not compatible with the power unit.</td>
<td>Warning</td>
</tr>
<tr>
<td>38</td>
<td>BM not compatible</td>
<td>The firmware version of a battery module is not compatible with the battery pack.</td>
<td>Warning</td>
</tr>
<tr>
<td>39</td>
<td>BP cable missing</td>
<td>The signal cable between the power unit and the battery pack is not connected.</td>
<td>Warning</td>
</tr>
<tr>
<td>40</td>
<td>BP disconnected</td>
<td>The DC power cable is missing or the battery pack breaker is not in the on position.</td>
<td>Warning</td>
</tr>
<tr>
<td>41</td>
<td>BP comm loss</td>
<td>The communication between the battery pack and the power unit is lost.</td>
<td>Warning</td>
</tr>
<tr>
<td>42</td>
<td>Internal comm loss</td>
<td>The power unit MCU lost communication with the power unit DSP.</td>
<td>Warning</td>
</tr>
<tr>
<td>43</td>
<td>On manual bypass</td>
<td>Turn the switch on the back of the power unit and the load is supplied by utility directly.</td>
<td>Warning</td>
</tr>
<tr>
<td>44</td>
<td>Self-diagnosis fault</td>
<td>The inverter voltage cannot be boosted to the default level.</td>
<td>Warning</td>
</tr>
<tr>
<td>45</td>
<td>PWR not compatible</td>
<td>The firmware version of the power DSP is not compatible with the system MCU.</td>
<td>Warning</td>
</tr>
<tr>
<td>46</td>
<td>ACC active</td>
<td>ACC circuit is currently active.</td>
<td>Informative</td>
</tr>
<tr>
<td>47</td>
<td>Manual power on</td>
<td>Press and hold the Enter button to turn on the power unit.</td>
<td>Informative</td>
</tr>
<tr>
<td>48</td>
<td>Manual power off</td>
<td>Press and hold the ESC button to turn off the power unit.</td>
<td>Informative</td>
</tr>
<tr>
<td>49</td>
<td>Remote power on</td>
<td>Use this command to turn on the power unit.</td>
<td>Informative</td>
</tr>
<tr>
<td>50</td>
<td>Remote power off</td>
<td>Use this command to turn off the power unit.</td>
<td>Informative</td>
</tr>
<tr>
<td>51</td>
<td>Testing battery</td>
<td>The batteries are being tested.</td>
<td>Informative</td>
</tr>
<tr>
<td>52</td>
<td>Battery is aging</td>
<td>The battery is aging and cannot support sufficient battery runtime.</td>
<td>Informative</td>
</tr>
<tr>
<td>53</td>
<td>BP not ready 1</td>
<td>The 1U battery pack is performing self-diagnosis and the battery modules are not ready.</td>
<td>Informative</td>
</tr>
<tr>
<td>54</td>
<td>BP not ready 2</td>
<td>The 1U battery pack is being reconfigured and the battery modules are not ready.</td>
<td>Informative</td>
</tr>
<tr>
<td>55</td>
<td>BP not ready 3</td>
<td>The voltage between two parallel 1U battery packs is too high and the battery packs are not ready.</td>
<td>Informative</td>
</tr>
<tr>
<td>56</td>
<td>BP not ready 4</td>
<td>The 1U battery pack has an internal communication failure and the battery pack is not ready.</td>
<td>Informative</td>
</tr>
<tr>
<td>57</td>
<td>BP MOSFET fault</td>
<td>The 1U battery pack MOSFET that puts battery modules in series is damaged.</td>
<td>Critical</td>
</tr>
<tr>
<td>58</td>
<td>BP discharge OCP</td>
<td>Over current protection was used for a 1U battery pack while discharging.</td>
<td>Critical</td>
</tr>
<tr>
<td>59</td>
<td>BP charge OCP</td>
<td>Over current protection was used for a 1U battery pack while charging.</td>
<td>Critical</td>
</tr>
<tr>
<td>Trap code</td>
<td>Alarm name</td>
<td>Alarm description</td>
<td>Alarm type</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------------------</td>
<td>------------------------------------------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>60</td>
<td>BP short circuit</td>
<td>The 1U battery pack shorted while discharging.</td>
<td>Critical</td>
</tr>
<tr>
<td>61</td>
<td>BP over voltage</td>
<td>The 1U battery pack exceeded the cell voltage limit while charging.</td>
<td>Critical</td>
</tr>
<tr>
<td>62</td>
<td>Under temperature 1</td>
<td>The 1U battery pack cell temperature is too low and cannot be charged.</td>
<td>Critical</td>
</tr>
<tr>
<td>63</td>
<td>Under temperature 2</td>
<td>The 1U battery pack cell temperature is too low and cannot be discharged.</td>
<td>Critical</td>
</tr>
<tr>
<td>64</td>
<td>Timeout shutdown</td>
<td>The power unit shut down because the battery pack exceeded the runtime (70 seconds for a single battery pack and 5 minutes for two battery packs).</td>
<td>Critical</td>
</tr>
<tr>
<td>65</td>
<td>2BPs not compatible</td>
<td>The firmware versions inside two battery packs are not compatible with each other.</td>
<td>Warning</td>
</tr>
<tr>
<td>66</td>
<td>BM into deep sleep</td>
<td>The battery module inside the 1U battery pack is in deep sleep mode to prevent being deeply discharged. In this condition, the 1U battery pack cannot support the load.</td>
<td>Warning</td>
</tr>
<tr>
<td>67</td>
<td>Charger start fault</td>
<td>The UPS starts the charger but the charger voltage cannot reach the required voltage.</td>
<td>Critical</td>
</tr>
<tr>
<td>68</td>
<td>BM charger fault</td>
<td>The charger inside the 1U battery pack has a problem that prevents it from charging the battery module.</td>
<td>Critical</td>
</tr>
<tr>
<td>69</td>
<td>BM bad</td>
<td>The battery module has a calibration issue or a capacity issue and needs to be replaced.</td>
<td>Critical</td>
</tr>
</tbody>
</table>

**General alarm condition**

**Action:**

1. If using the HPE DirectFlow UPS Management Module web interface, check the log files to obtain specific error information to help identify the problem.
   
   For more information about the causes of a general alarm condition, see "LED and audible alarm troubleshooting (on page 90)."

2. Check the batteries:
   a. Allow the UPS batteries to charge for 48 hours.
   b. If a battery fault occurs, replace the batteries.

3. Reduce the load:
   a. Power down the UPS. For more information, see "Powering down the UPS and battery packs (on page 80)."
   b. Remove one or more load devices to reduce the power requirements.
   c. Wait at least 5 seconds and restart the UPS.
   d. If the condition persists, verify that the load devices are not defective.

4. Allow the UPS to cool:
   a. Power down the UPS. For more information, see "Powering down the UPS and battery packs (on page 80)."
   b. Clear vents and remove any heat sources.
   c. Verify that the airflow around the UPS is not restricted.

5. Wait at least 5 minutes and restart the UPS.

6. If the condition persists, contact a Hewlett Packard Enterprise authorized service representative.

7. If a battery fault occurs, replace the batteries.
UPS does not start

**Action:**
Verify the following:
1. The power cord is connected to a utility power receptacle.
2. The power module is attached to the power unit and the manual bypass switch is in the normal position.
3. The input voltage is within normal voltage range.

**Wiring condition**

**Action:** Contact a qualified electrician to verify the following:
- The line wires are not reversed in the wall outlet.
- A neutral wire connection exists.

**Utility power condition**

**Possible cause:**
The input voltage is not within +10 or -15 percent of nominal voltage.

The UPS is receiving utility power that might be unstable or in brownout conditions. The UPS continues to supply power to the connected equipment. If conditions worsen, the UPS might switch to battery power.

**Action:**
1. Check the input voltage and reconfigure the UPS using the UPS menu options (on page 74).
2. Contact a qualified electrician to verify that the utility power is suitable for the UPS.

**Battery connection condition**

**Possible cause:**
- The power cable or signal cable is not connected.
- The battery circuit breaker is not switched on.
- One or more battery strings are disconnected.

**Action:**
1. Be sure that all the battery modules are fully seated and locked in place.
2. If the condition persists, contact a Hewlett Packard Enterprise authorized service representative.

**REPO condition**

**Action:**
- If the remote switch is closed, then open the switch to enable power to the output receptacles.
- If the condition occurred while reconnecting a disconnected REPO port, then verify the contactor of the REPO connector pins.

For more information about the REPO port for an R12000DF power unit, see “Connecting the R12000DF REPO port (on page 50).”
For more information about the REPO port for an R18000DF power unit, see "Connecting the R18000DF REPO port (on page 55)."

**UPS is in Bypass mode**

**Possible cause:**  
The equipment transferred to bypass utility power. Battery mode (on page 77) is not available and the equipment is not protected; however, the utility power continues to be passively filtered by the power unit.

**Action:**  
Check the UPS Event Log or the Management Module web interface for one of the following alarms:
- Extended overload
- Over temperature
- Output short
- Hardware failure

To attempt different resolutions, see "General alarm condition (on page 93)."

**Overload condition**

**Possible cause:** Power requirements exceed the UPS capacity. For output overload ranges, see "UPS output specifications (on page 114)."

**Action:**  
Remove one or more load devices to reduce the power requirements. The UPS continues to operate, but might switch to Bypass mode (on page 78) if the load increases.  
The alarm resets when the condition becomes inactive.

**UPS is in Battery mode**

**Action:** Save files, and then power down connected load devices.

**UPS frequently switches between utility and battery power**

**Action:**  
1. Check the input voltage, and then reconfigure the UPS menu options (on page 74).
2. Contact a qualified electrician to verify that the utility power is suitable for the UPS.

**Battery fault**

**Action:** If a battery fault occurs, replace the batteries.

**UPS backup time is short**

**Action:**  
1. Verify that the battery pack circuit breakers are switched to the On position.
2. Verify that the life of the batteries did not exceed the limit.
3. If the condition persists, contact a Hewlett Packard Enterprise authorized service representative.

**Low battery shutdown**

**Possible cause:**
An ungraceful shutdown of any attached servers occurs when the UPS is in a low battery condition.

**Action:**
1. Verify that the power management software is not delaying the shutdown of attached servers when the UPS is in a low battery condition.
2. Allow the UPS batteries to charge for 24 hours.

**Deep Sleep mode**

To prevent battery modules from discharging when the charger is not available, the battery pack enters Deep Sleep mode. Each cell displays Z V on the LCD screen. Deep Sleep mode occurs under the following conditions:
- The UPS is in Bypass mode.
- The UPS charger limit is set to NO CHARGE and at least one battery module has a voltage of less than 36 V.

When these conditions are cleared and no battery module has a low voltage, the battery pack wakes up from Deep Sleep mode automatically.

<table>
<thead>
<tr>
<th>Deep Sleep mode setting</th>
<th>Charger Limit is set to any setting except NO CHARGE</th>
<th>Charger Limit is set to NO CHARGE and a battery module has low voltage</th>
<th>Charger Limit is set to NO CHARGE and no battery modules have low voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>The UPS clears &quot;Enter Deep Sleep Mode.&quot;</td>
<td>Wake up.</td>
<td>Keep at Deep Sleep mode until the handle of the battery module is pressed and the low-voltage battery module is replaced.</td>
<td>Wake up.</td>
</tr>
</tbody>
</table>

Reset the power on the power module to avoid dropping loads during troubleshooting.
1. Set the power module to Bypass mode.
2. Disconnect the power module.
3. Reconnect the power module.
4. Set the power module to Normal mode.

**UPS alarm code decision flowcharts**

The following decision flowcharts can assist with troubleshooting and diagnosing UPS issues.
Troubleshooting 97
Troubleshooting

- **OVER TEMPERATURE**: Yes → The UPS has detected that inverter temperature have exceeded limit.
  - No

- **OVER TEMPERATURE**: Yes → The UPS has detected that bypass SOR temperature have exceeded limit.
  - No

- **OVER TEMPERATURE**: Yes → The UPS has detected that ambient temperature have exceeded limit.
  - No

- **OVER TEMPERATURE**: Yes → The UPS has detected that 1U BP cell temperature have exceeded limit during charging.
  - No

- **OVER TEMPERATURE**: Yes → The UPS has detected that 1U BP MOSFET switch temperature have exceeded limit.
  - No

- **OVER TEMPERATURE**: Yes → The UPS has detected that 1U BP cell temperature have exceeded limit during discharging.
  - No

- Check if there is anything block the airway of fan? Yes → Remove the material which block the airway of fan and this fault can be reset automatically
  - No → The fault will be clear while the ambient temperature is within acceptable range

- **RMA PU**: No → No

- **RMA BP**: No → No

- Fault alarm can be clear automatically? Yes → END
  - No

- If the ambient temperature is higher than 35°C? Yes → END
  - No

- If the ambient temperature is higher than 35°C? Yes → END
  - No

- If the ambient temperature is higher than 35°C? Yes → END
  - No
Troubleshooting 101

EMERGENCY POWER OFF

Yes:
The external contacts in the rear of the UPS are configured for EPO operation and they have been activated.

No:

Check the EPO connector at rear panel is short or not?

Yes:

END

No:

RMA, PU

Output Overload

Yes:
Load levels are at, or have exceeded, the overload threshold limit.

No:

The fault is clear after removing the load?

Yes:

END

No:

RMA, PU

Battery Low

Yes:
Warning alarm indicating battery remains or battery time remaining is lower than the battery low warning level defined for the UPS. Ask customer start UPS to charge battery.

No:

END

INPUT VOLT NOT OK

Yes:
INPUT VOLTAGE/FREQUENCY OUT OF RANGE

No:

END

CHECK IF INPUT VOLTAGE RANGE IS +10% TO -10% OF SET OUTPUT VOLTAGE?

Yes:

RMA, PU

No:

END

INPUT FREQ NOT OK

Yes:
INPUT VOLTAGE/FREQUENCY OUT OF RANGE

No:

END

CHECK IF INPUT FREQUENCY RANGE IS IN THE RANGE OF 47Hz - 63Hz?

Yes:

RMA, PU

No:

END
Troubleshooting 103

1. **SP DISCONNECTED**
   - **Yes**: The BP power cable is not connected or battery breaker is opened?
     - **Yes**: Check the fault is clear or not while BP power cable is unplugged or battery breaker is closed?
       - **Yes**: END
       - **No**: RMA, PU
     - **No**: RMA, PU

2. **BF Missing**
   - **Yes**: The BF was not connected to PU or the signal between DB and PU is lost.
     - **Yes**: Check I/O BOX connection between PU and I/O Box well?
       - **Yes**: RMA PU & DB
       - **No**: ASK Customer to connect well between PU and I/O BOX and test again.
     - **No**: END

3. **ATTACH > 2 BP**
   - **Yes**: More than two parallel BP's are connected to UPS?
     - **Yes**: Check the fault is clear or not when the max amount of BP connected with UPS must be <=
       - **Yes**: END
       - **No**: RMA, BP
     - **No**: RMA, BP

4. **NOT SAME BP TYPE**
   - **Yes**: Battery types of two parallel BP's are different?
     - **Yes**: Check the fault is clear or not when the parallel BP connected to same type
       - **Yes**: END
       - **No**: RMA, BP
     - **No**: END
LEDs of BMs are blinking but SOC is not increasing for >1 hour (two BMs)

Yes

Disconnect one BP (Battery power cable and CAN cable)

Follow the procedure of only one BP above to check the charger

Charger is working fine?

Yes

Put the battery power cable and CAN cable back and then keep BMs in recharging

No

Trouble-shooting the charger

END

No

END

BP with BM
LED dimmed

BM into deep sleep mode or BMs are drained

Yes

BP firmware: 1UPB0205 (ver 69)

No

BP firmware: 1UPB0205 (ver 2.09) and above

No "deep sleep mode" function. BMs will keep discharging. Remove all the BMs out of slots

Remove BM

BM go into deep sleep mode

Check the charger power setting or turn on the UPS to let charger be enabled

END
Specifications

Environmental specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating temperature</td>
<td>10°C-35°C (50°F-95°F); UL-tested at 30°C (86°F)</td>
</tr>
<tr>
<td>Non-operating temperature</td>
<td>-25°C-60°C (-13°F-140°F)</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>5%-95%; non-condensing</td>
</tr>
<tr>
<td>Operating altitude</td>
<td>Up to 3050 m (10,000 ft) above sea level</td>
</tr>
<tr>
<td>Non-operating altitude</td>
<td>9144 m (30,000 ft) above sea level</td>
</tr>
<tr>
<td>Audible noise</td>
<td>&lt;= 55 dBA</td>
</tr>
</tbody>
</table>

Power unit physical specifications

1U R12000DF specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>4.25 cm (1.7 in)</td>
</tr>
<tr>
<td>Depth</td>
<td>67.7 cm (26.7 in)</td>
</tr>
<tr>
<td>Total depth</td>
<td>67.7 cm (26.7 in)</td>
</tr>
<tr>
<td>Width</td>
<td>48.26 cm (19.0 in)</td>
</tr>
<tr>
<td>Weight</td>
<td>16 kg (35.2 lb)</td>
</tr>
<tr>
<td>Ambient operation</td>
<td>10°C-35°C (50°F-95°F)</td>
</tr>
</tbody>
</table>

2U R18000DF specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>8.6 cm (3.386 in)</td>
</tr>
<tr>
<td>Depth</td>
<td>67.7 cm (26.654 in)</td>
</tr>
<tr>
<td>Total depth</td>
<td>92.2 cm (36.299 in)</td>
</tr>
<tr>
<td>Width</td>
<td>48.26 cm (19.000 in)</td>
</tr>
<tr>
<td>Weight</td>
<td>20.87 kg (46 lb)</td>
</tr>
</tbody>
</table>

REPO port specifications

The REPO port meets the requirements of NFPA Articles 645-10 and 645-11 for a Disconnecting Means.

Battery pack physical specifications

The following tables include specifications for the DirectFlow Battery Packs and battery modules.
### 1U battery pack specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>4.2 cm (1.65 in)</td>
</tr>
<tr>
<td>Depth</td>
<td>93.73 cm (36.9 in)</td>
</tr>
<tr>
<td>Depth with cabling</td>
<td>93.73 cm (36.9 in)</td>
</tr>
<tr>
<td>Width</td>
<td>48.0 cm (18.90 in)</td>
</tr>
<tr>
<td>Weight</td>
<td>12 kg (26.5 lb)</td>
</tr>
<tr>
<td>Battery module type</td>
<td>Lithium-ion</td>
</tr>
</tbody>
</table>

### 3U battery pack specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>13.000 cm (5.118 in)</td>
</tr>
<tr>
<td>Depth</td>
<td>82.842 cm (32.615 in)</td>
</tr>
<tr>
<td>Depth with cabling</td>
<td>89.242 cm (35.135 in)</td>
</tr>
<tr>
<td>Width</td>
<td>48.260 cm (19.000 in)</td>
</tr>
<tr>
<td>Weight</td>
<td>100 kg (220 lb)</td>
</tr>
<tr>
<td>Battery module type</td>
<td>Lead acid</td>
</tr>
</tbody>
</table>

### Lead acid battery module specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Maintenance-free, sealed, valve regulated lead acid batteries</td>
</tr>
<tr>
<td>Weight</td>
<td>20 kg (44 lb)</td>
</tr>
</tbody>
</table>
| Backup life        | • >1 minute of backup support for a 3-year minimum float service life at 30°C (86°F)  
                     | • >40 seconds of backup support after a 3-year minimum float service life at 30°C (86°F)  |
| Voltage            | Battery string voltage of 108 V                                              |
| Charging           | Complete charge in no more than 24 hours; partial charge in approximately 3 hours to reach 80 percent capacity at default nominal utility voltage and no load |

### Lithium-ion battery module specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Maintenance-free, sealed, lithium-ion batteries</td>
</tr>
<tr>
<td>Weight</td>
<td>1.4 kg (3.1 lb)</td>
</tr>
<tr>
<td>Backup life</td>
<td>Up to 300 seconds (5 minutes) with full load and two packs operating in parallel</td>
</tr>
<tr>
<td>Voltage</td>
<td>Single battery string voltage of 43.2 V. The 1UBP unit is 345.6 V.</td>
</tr>
</tbody>
</table>
| Charging           | Complete charge in no more than 2 hours; partial charge in approximately 1 hour to reach 80 percent capacity at default nominal utility voltage and no load.  
                     | 48 V, 2 A                                                                    |
Battery runtime

Average battery runtime is approximate and varies depending on connected equipment, configuration, battery age, temperature, and operating conditions. Estimated runtime is based on the batteries at beginning of life.

Lead acid battery runtime

<table>
<thead>
<tr>
<th>Power</th>
<th>Runtime with one battery pack</th>
<th>Runtime with two battery packs</th>
</tr>
</thead>
<tbody>
<tr>
<td>415 kVA (4.5 kVA)</td>
<td>&gt;13 min</td>
<td>&gt;40 min</td>
</tr>
<tr>
<td>415 kVA (9 kVA)</td>
<td>&gt;7 min</td>
<td>&gt;18 min</td>
</tr>
<tr>
<td>415 kVA (12 kVA)</td>
<td>&gt;4:30 min</td>
<td>&gt;13 min</td>
</tr>
<tr>
<td>415 kVA (13.5 kVA)</td>
<td>&gt;4 min</td>
<td>&gt;11 min</td>
</tr>
<tr>
<td>415 kVA (15 kVA)</td>
<td>&gt;2:30 min</td>
<td>&gt;10 min</td>
</tr>
<tr>
<td>415 kVA (18 kVA)</td>
<td>&gt;2 min</td>
<td>&gt;7:30 min</td>
</tr>
</tbody>
</table>

Lithium-ion battery runtime

<table>
<thead>
<tr>
<th>Power</th>
<th>Runtime with one battery pack</th>
<th>Runtime with two battery packs</th>
</tr>
</thead>
<tbody>
<tr>
<td>415 VAC (3.75 kVA)</td>
<td>&gt;9:30 min</td>
<td>&gt;20 min</td>
</tr>
<tr>
<td>415 VAC (7.5 kVA)</td>
<td>&gt;4:30 min</td>
<td>&gt;10 min</td>
</tr>
<tr>
<td>415 VAC (11 kVA)</td>
<td>&gt;2:30 min</td>
<td>&gt;6:30 min</td>
</tr>
<tr>
<td>415 VAC (12 kVA)</td>
<td>&gt;1:30 min</td>
<td>&gt;6 min</td>
</tr>
<tr>
<td>415 VAC (15 kVA)</td>
<td>&gt;1 min</td>
<td>&gt;5 min</td>
</tr>
</tbody>
</table>

UPS input specifications

<table>
<thead>
<tr>
<th>UPS model</th>
<th>Utility voltage frequency (Hz)</th>
<th>Available settings</th>
<th>Dedicated branch circuit rating (A)</th>
<th>Line cord</th>
</tr>
</thead>
<tbody>
<tr>
<td>power unit NA/JPN</td>
<td>50/60 Hz</td>
<td>480/415/400/380 V</td>
<td>24 A</td>
<td>480/415/400/380 V, 5-wire; PE 30 A cord and plug</td>
</tr>
<tr>
<td>power unit INTL</td>
<td>50/60 Hz</td>
<td>480/415/400/380 V</td>
<td>24 A</td>
<td>480/415/400/380 V, 5-wire, PE 30 A cord and plug</td>
</tr>
</tbody>
</table>

The maximum load applies to linear/PFC loads.

UPS output specifications

<table>
<thead>
<tr>
<th>UPS model</th>
<th>Maximum current output of receptacles</th>
</tr>
</thead>
<tbody>
<tr>
<td>power unit NA/JPN</td>
<td>30 A output (2 receptacles)</td>
</tr>
<tr>
<td>power unit INTL</td>
<td>30 A output (2 receptacles)</td>
</tr>
</tbody>
</table>

The maximum load applies to linear/PFC loads.
Voltage specifications

During normal operation, the UPS power output is equal to the UPS power input. The UPS automatically adjusts the output voltage rate to match the connected DirectFlow Input/Output Power Module. The output voltage is set to 415 V by default for the 400 V/415 V power module. To change the 400 V/415 V power module to the 400 V setting, use the "UPS menu options (on page 74)."

<table>
<thead>
<tr>
<th>Configuration setting</th>
<th>Available nominal output voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>380 VAC</td>
<td>380 VAC</td>
</tr>
<tr>
<td>400 VAC</td>
<td>400 VAC</td>
</tr>
<tr>
<td>415 VAC</td>
<td>415 VAC</td>
</tr>
<tr>
<td>480 VAC</td>
<td>480 VAC</td>
</tr>
</tbody>
</table>

Output tolerance specifications

<table>
<thead>
<tr>
<th>Source of power</th>
<th>Regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utility power (nominal range)</td>
<td>-15% to +10% of nominal output voltage rating (within the guidelines of the Computer Business Equipment Manufacturers Association)</td>
</tr>
<tr>
<td>Battery power</td>
<td>±5% of nominal output voltage rating</td>
</tr>
</tbody>
</table>

Output feature specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online efficiency</td>
<td>93-98% nominal input voltage with 380 VAC input</td>
</tr>
<tr>
<td></td>
<td>87-98% nominal input voltage with 480 VAC input</td>
</tr>
<tr>
<td>Voltage wave shape</td>
<td>Sine wave; 3% THD with typical PFC load</td>
</tr>
<tr>
<td>Surge suppression</td>
<td>High-energy 10,000 A peak</td>
</tr>
<tr>
<td>Noise filtering</td>
<td>Line filter for normal and common mode use</td>
</tr>
</tbody>
</table>
**Spares**

**UPS spare parts list**

To order a spare, visit the Hewlett Packard Enterprise website (http://www.hpe.com/info/hpparts).

To replace parts under warranty, contact a Hewlett Packard Enterprise authorized service representative.

### R12000DF UPS spare parts list

<table>
<thead>
<tr>
<th>Spare kit number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>708041-001</td>
<td>SPS-DF PU R12KDF UPS 1U POD</td>
</tr>
<tr>
<td>769753-001</td>
<td>SPS-DF PU R12KDF UPS 1U W/CARD SLOT</td>
</tr>
<tr>
<td>766461-001</td>
<td>SPS-ASSY, 32A 400V INTL R12KDF IEC309 I/O MOD 1U</td>
</tr>
<tr>
<td>766462-001</td>
<td>SPS-ASSY, 30A 400V NA R12KDF IEC309 POD Mod</td>
</tr>
<tr>
<td>766463-001</td>
<td>SPS-ASSY, 32A 380V CN R12KDF UNTERM I/O MOD 1U</td>
</tr>
<tr>
<td>766464-001</td>
<td>SPS-ASSY, 30A 480V NA R12KDF L22-30 I/O MOD 1U</td>
</tr>
<tr>
<td>766465-001</td>
<td>SPS-ASSY, 30A 480V NA R12KDF IEC309 I/O MOD 1U</td>
</tr>
<tr>
<td>769754-001</td>
<td>SPS-ASSY, 30A 400V NA R12KDF IEC309 I/O MOD 1U</td>
</tr>
</tbody>
</table>

### R18000DF UPS spare parts list

<table>
<thead>
<tr>
<th>Spare kit number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>708042-001</td>
<td>SPS-PU R18KVA UPS 480/415/400V 2U WW</td>
</tr>
<tr>
<td>708043-001</td>
<td>SPS-DF UPS BAT PACK 1U Lilon WW</td>
</tr>
<tr>
<td>750796-001</td>
<td>SPS-DF UPS BATMOD SET (4) 1U Lilon WW*</td>
</tr>
<tr>
<td>708044-001</td>
<td>SPS- DirectFlow UPS BAT PACK 3U VRLA WW</td>
</tr>
<tr>
<td>730376-001</td>
<td>SPS-BAT MODULE, DirectFlow UPS, 3U, VRLA, WW</td>
</tr>
<tr>
<td>709383-001</td>
<td>SPS-32A 400V IL R18000DF IEC309 I/O Mod</td>
</tr>
<tr>
<td>709384-001</td>
<td>SPS-30A 400V NA R18000DF IEC309 I/O Mod (1:1)</td>
</tr>
<tr>
<td>709385-001</td>
<td>SPS-32A 380V CN R18000DF Unterm I/O Mod</td>
</tr>
<tr>
<td>709386-001</td>
<td>SPS-30A 480V NA R18000DF L22-30 I/O Mod</td>
</tr>
<tr>
<td>709387-001</td>
<td>SPS-30A 480V NA R18000DF IEC309 I/O Mod</td>
</tr>
<tr>
<td>749319-001</td>
<td>SPS-30A 400V NA R18000DF IEC309 I/O Mod (1:2)</td>
</tr>
<tr>
<td>708045-001</td>
<td>SPS-DirectFlow 2nd Battery cable</td>
</tr>
<tr>
<td>753237-001</td>
<td>SPS-CBL DB15 CANbus DirectFlow BP</td>
</tr>
<tr>
<td>714590-001</td>
<td>SPS - ASSY RAIL ADJ FIXED 1U BP</td>
</tr>
<tr>
<td>763884-001</td>
<td>SPS - LCD, 2UPU</td>
</tr>
<tr>
<td>693872-001</td>
<td>SPS-ASSY DirectFlow UPS Management</td>
</tr>
</tbody>
</table>

*Two 750796-001 spare kits are required to fill one 1U battery pack.*
Hardware options

For information on the supported hardware options, see the Hewlett Packard Enterprise website (http://www.hpe.com/info/rackandpower).
Electrostatic discharge

Preventing electrostatic discharge

To prevent damaging the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

To prevent electrostatic damage:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

Grounding methods to prevent electrostatic discharge

Several methods are used for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm ± 10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.
- Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, have an authorized reseller install the part.

For more information on static electricity or assistance with product installation, contact an authorized reseller.
Warranty and regulatory information

Warranty information

HPE ProLiant and x86 Servers and Options (http://www.hpe.com/support/ProLiantServers-Warranties)
HPE Enterprise Servers (http://www.hpe.com/support/EnterpriseServers-Warranties)
HPE Storage Products (http://www.hpe.com/support/Storage-Warranties)
HPE Networking Products (http://www.hpe.com/support/Networking-Warranties)

Regulatory information

Safety and regulatory compliance


Turkey RoHS material content declaration

Türkiye Cumhuriyeti: EEE Yönetmeliğine Uygundur

Ukraine RoHS material content declaration

Обладнання відповідає вимогам Технічного регламенту щодо обмеження використання деяких небезпечних речовин в електричному та електронному обладнанні, затвердженого постановою Кабінету Міністрів України від 3 грудня 2008 № 1057
Support and other resources

Accessing Hewlett Packard Enterprise Support

- For live assistance, go to the Contact Hewlett Packard Enterprise Worldwide website (http://www.hpe.com/assistance).
- To access documentation and support services, go to the Hewlett Packard Enterprise Support Center website (http://www.hpe.com/support/hpesc).

Information to collect

- Technical support registration number (if applicable)
- Product name, model or version, and serial number
- Operating system name and version
- Firmware version
- Error messages
- Product-specific reports and logs
- Add-on products or components
- Third-party products or components

Accessing updates

- Some software products provide a mechanism for accessing software updates through the product interface. Review your product documentation to identify the recommended software update method.
- To download product updates, go to either of the following:
  - Hewlett Packard Enterprise Support Center Get connected with updates page (http://www.hpe.com/support/e-updates)
  - Software Depot website (http://www.hpe.com/support/softwaredepot)

**IMPORTANT**: Access to some updates might require product entitlement when accessed through the Hewlett Packard Enterprise Support Center. You must have an HP Passport set up with relevant entitlements.

Websites

- Hewlett Packard Enterprise Information Library (http://www.hpe.com/info/enterprise/docs)
- Hewlett Packard Enterprise Support Center (http://www.hpe.com/support/hpesc)
- Contact Hewlett Packard Enterprise Worldwide (http://www.hpe.com/assistance)
Customer Self Repair

Hewlett Packard Enterprise products are designed with many Customer Self Repair (CSR) parts to minimize repair time and allow for greater flexibility in performing defective parts replacement. If during the diagnosis period Hewlett Packard Enterprise (or Hewlett Packard Enterprise service providers or service partners) identifies that the repair can be accomplished by the use of a CSR part, Hewlett Packard Enterprise will ship that part directly to you for replacement. There are two categories of CSR parts:

- **Mandatory**—Parts for which customer self repair is mandatory. If you request Hewlett Packard Enterprise to replace these parts, you will be charged for the travel and labor costs of this service.

- **Optional**—Parts for which customer self repair is optional. These parts are also designed for customer self repair. If, however, you require that Hewlett Packard Enterprise replace them for you, there may or may not be additional charges, depending on the type of warranty service designated for your product.

**NOTE:** Some Hewlett Packard Enterprise parts are not designed for customer self repair. In order to satisfy the customer warranty, Hewlett Packard Enterprise requires that an authorized service provider replace the part. These parts are identified as "No" in the Illustrated Parts Catalog.

Based on availability and where geography permits, CSR parts will be shipped for next business day delivery. Same day or four-hour delivery may be offered at an additional charge where geography permits. If assistance is required, you can call the Hewlett Packard Enterprise Support Center and a technician will help you over the telephone. Hewlett Packard Enterprise specifies in the materials shipped with a replacement CSR part whether a defective part must be returned to Hewlett Packard Enterprise. In cases where it is required to return the defective part to Hewlett Packard Enterprise, you must ship the defective part back to Hewlett Packard Enterprise within a defined period of time, normally five (5) business days. The defective part must be returned with the associated documentation in the provided shipping material. Failure to return the defective part may result in Hewlett Packard Enterprise billing you for the replacement. With a customer self repair, Hewlett Packard Enterprise will pay all shipping and part return costs and determine the courier/carrier to be used.

For more information about the Hewlett Packard Enterprise CSR program, contact your local service provider. For the North American program, go to the Hewlett Packard Enterprise CSR website (http://www.hpe.com/support/selfrepair).

Réparation par le client (CSR)

Les produits Hewlett Packard Enterprise comportent de nombreuses pièces CSR (Customer Self Repair = réparation par le client) afin de minimiser les délais de réparation et faciliter le remplacement des pièces défectueuses. Si pendant la période de diagnostic, Hewlett Packard Enterprise (ou ses partenaires ou mainteneurs agréés) détermine que la réparation peut être effectuée à l'aide d'une pièce CSR, Hewlett Packard Enterprise vous l'envoie directement. Il existe deux catégories de pièces CSR :
• **Obligatoire**—Pièces pour lesquelles la réparation par le client est obligatoire. Si vous demandez à Hewlett Packard Enterprise de remplacer ces pièces, les coûts de déplacement et main d'œuvre du service vous seront facturés.

• **Facultatif**—Pièces pour lesquelles la réparation par le client est facultative. Ces pièces sont également conçues pour permettre au client d'effectuer lui-même la réparation. Toutefois, si vous demandez à Hewlett Packard Enterprise de remplacer ces pièces, l'intervention peut ou non vous être facturée, selon le type de garantie applicable à votre produit.

**REMARQUE** : Certaines pièces Hewlett Packard Enterprise ne sont pas conçues pour permettre au client d'effectuer lui-même la réparation. Pour que la garantie puisse s'appliquer, Hewlett Packard Enterprise exige que le remplacement de la pièce soit effectué par un Mainteneur Agréé. Ces pièces sont identifiées par la mention "Non" dans le Catalogue illustré.

Les pièces CSR sont livrées le jour ouvré suivant, dans la limite des stocks disponibles et selon votre situation géographique. Si votre situation géographique le permet et que vous demandez une livraison le jour même ou dans les 4 heures, celle-ci vous sera facturée. Pour toute assistance, appelez le Centre d’assistance Hewlett Packard Enterprise pour qu’un technicien vous aide au téléphone. Dans les documents envoyés avec la pièce de rechange CSR, Hewlett Packard Enterprise précise s’il est nécessaire de lui retourner la pièce défectueuse. Si c’est le cas, vous devez le faire dans le délai indiqué, généralement cinq (5) jours ouvrés. La pièce et sa documentation doivent être retournées dans l’emballage fourni. Si vous ne retournez pas la pièce défectueuse, Hewlett Packard Enterprise se réserve le droit de vous facturer les coûts de remplacement. Dans le cas d’une pièce CSR, Hewlett Packard Enterprise supporte l’ensemble des frais d’expédition et de retour, et détermine la société de courses ou le transporteur à utiliser.


**Riparazione da parte del cliente**

Per abbreviare i tempi di riparazione e garantire una maggiore flessibilità nella sostituzione di parti difettose, i prodotti Hewlett Packard Enterprise sono realizzati con numerosi componenti che possono essere riparati direttamente dal cliente (CSR, Customer Self Repair). Se in fase di diagnostica Hewlett Packard Enterprise (o un centro di servizi o di assistenza Hewlett Packard Enterprise) identifica il guasto come riparabile mediante un ricambio CSR, Hewlett Packard Enterprise lo spedirà direttamente al cliente per la sostituzione. Vi sono due categorie di parti CSR:

• **Obbligatorie**—Parti che devono essere necessariamente riparate dal cliente. Se il cliente ne affida la riparazione ad Hewlett Packard Enterprise, deve sostenere le spese di spedizione e di manodopera per il servizio.

• **Opzionali**—Parti la cui riparazione da parte del cliente è facoltativa. Si tratta comunque di componenti progettati per questo scopo. Se tuttavia il cliente ne richiede la sostituzione ad Hewlett Packard Enterprise, potrebbe dover sostenere spese addizionali a seconda del tipo di garanzia previsto per il prodotto.

**NOTA** : alcuni componenti Hewlett Packard Enterprise non sono progettati per la riparazione da parte del cliente. Per rispettare la garanzia, Hewlett Packard Enterprise richiede che queste parti siano sostituite da un centro di assistenza autorizzato. Tali parti sono identificate da un "No" nel Catalogo illustrato dei componenti.

In base alla disponibilità e alla località geografica, le parti CSR vengono spedite con consegna entro il giorno lavorativo seguente. La consegna nel giorno stesso o entro quattro ore è offerta con un supplemento di costo solo in alcune zone. In caso di necessità si può richiedere l’assistenza telefonica di un addetto del centro di supporto tecnico Hewlett Packard Enterprise. Nel materiale fornito con una parte di ricambio CSR, Hewlett Packard Enterprise specifica se il cliente deve restituire dei componenti. Qualora sia richiesta la resa ad Hewlett Packard Enterprise del componente difettoso, lo si deve spedire ad Hewlett Packard Enterprise entro un determinato periodo di tempo, generalmente cinque (5) giorni lavorativi. Il componente difettoso deve essere restituito con la documentazione associata nell’imballo di
Customer Self Repair

Hewlett Packard Enterprise Produkte enthalten viele CSR-Teile (Customer Self Repair), um Reparaturzeiten zu minimieren und höhere Flexibilität beim Austausch defekter Bauteile zu ermöglichen. Wenn Hewlett Packard Enterprise (oder ein Hewlett Packard Enterprise Servicepartner) bei der Diagnose feststellt, dass das Produkt mithilfe eines CSR-Teils repariert werden kann, sendet Ihnen Hewlett Packard Enterprise dieses Bauteil zum Austausch direkt zu. CSR-Teile werden in zwei Kategorien unterteilt:

- **Zwingend**—Teile, für die das Customer Self Repair-Verfahren zwingend vorgegeben ist. Wenn Sie den Austausch dieser Teile von Hewlett Packard Enterprise vornehmen lassen, werden Ihnen die Anfahrt- und Arbeitskosten für diesen Service berechnet.


Reparaciones del propio cliente

Los productos de Hewlett Packard Enterprise incluyen muchos componentes que el propio usuario puede reemplazar (Customer Self Repair, CSR) para minimizar el tiempo de reparación y ofrecer una mayor flexibilidad a la hora de realizar sustituciones de componentes defectuosos. Si, durante la fase de diagnóstico, Hewlett Packard Enterprise (o los proveedores o socios de servicio de Hewlett Packard Enterprise) identifica que una reparación puede llevarse a cabo mediante el uso de un componente CSR, Hewlett Packard Enterprise le enviará dicho componente directamente para que realice su sustitución. Los componentes CSR se clasifican en dos categorías:
Customer Self Repair

Veel onderdelen in Hewlett Packard Enterprise producten zijn door de klant zelf te repareren, waardoor de reparatieduur tot een minimum beperkt kan blijven en de flexibiliteit in het vervangen van defecte onderdelen groter is. Deze onderdelen worden CSR-onderdelen (Customer Self Repair) genoemd. Als Hewlett Packard Enterprise (of een Hewlett Packard Enterprise Service Partner) bij de diagnose vaststelt dat de reparatie kan worden uitgevoerd met een CSR-onderdeel, verzendt Hewlett Packard Enterprise dat onderdeel rechtstreeks naar u, zodat u het defecte onderdeel daarmee kunt vervangen. Er zijn twee categorieën CSR-onderdelen:

- **Verplicht**—Onderdelen waarvoor reparatie door de klant verplicht is. Als u Hewlett Packard Enterprise verzoekt deze onderdelen voor u te vervangen, worden u voor deze service reiskosten en arbeidsloon in rekening gebracht.

- **Optioneel**—Onderdelen waarvoor reparatie door de klant optioneel is. Ook deze onderdelen zijn ontworpen voor reparatie door de klant. Als u echter Hewlett Packard Enterprise verzoekt deze onderdelen voor u te vervangen, kunnen daarvoor extra kosten in rekening worden gebracht, afhankelijk van het type garantieservice voor het product.

OPMERKING: Sommige Hewlett Packard Enterprise onderdelen zijn niet ontwikkeld voor reparatie door de klant. In verband met de garantievoorwaarden moet het onderdeel door een geautoriseerde Service Partner worden vervangen. Deze onderdelen worden in de geïllustreerde onderdelencatalogus aangemerkt met "Nee".

Afhankelijk van de leverbaarheid en de locatie worden CSR-onderdelen verzonden voor levering op de eerstvolgende werkdag. Levering op dezelfde dag of binnen vier uur kan tegen meerkosten worden aangeboden, indien dit mogelijk is gezien de locatie. Indien assistentie is gewenst, belt u het Hewlett Packard Enterprise Support Center om via de telefoon ondersteuning van een technicus te ontvangen.

Neem contact op met een Service Partner voor meer informatie over het Customer Self Repair programma van Hewlett Packard Enterprise. Informatie over Service Partners vindt u op de Hewlett Packard Enterprise website (http://www.hpe.com/support/selfrepair).

Reparo feito pelo cliente

Os produtos da Hewlett Packard Enterprise são projetados com muitas peças para reparo feito pelo cliente (CSR) de modo a minimizar o tempo de reparo e permitir maior flexibilidade na substituição de peças com defeito. Se, durante o período de diagnóstico, a Hewlett Packard Enterprise (ou fornecedores/parceiros da Hewlett Packard Enterprise) concluir que o reparo pode ser efetuado pelo uso de uma peça CSR, a Hewlett Packard Enterprise enviará a peça diretamente ao cliente. Há duas categorias de peças CSR:

- **Obrigatória**—Peças cujo reparo feito pelo cliente é obrigatório. Se desejar que a Hewlett Packard Enterprise substitua essas peças, serão cobradas as despesas de transporte e mão-de-obra do serviço.

- **Opcional**—Peças cujo reparo feito pelo cliente é opcional. Essas peças também são projetadas para o reparo feito pelo cliente. No entanto, se desejar que a Hewlett Packard Enterprise as substitua, pode haver ou não a cobrança de taxa adicional, dependendo do tipo de serviço de garantia destinado ao produto.

**OBSERVAÇÃO:** Algumas peças da Hewlett Packard Enterprise não são projetadas para o reparo feito pelo cliente. A fim de cumprir a garantia do cliente, a Hewlett Packard Enterprise exige que um técnico autorizado substitua a peça. Essas peças estão identificadas com a marca "No" (Não), no catálogo de peças ilustrado.

Conforme a disponibilidade e o local geográfico, as peças CSR serão enviadas no primeiro dia útil após o pedido. Onde as condições geográficas permitirem, a entrega no mesmo dia ou em quatro horas pode ser feita mediante uma taxa adicional. Se precisar de auxílio, entre em contato com o Centro de suporte técnico da Hewlett Packard Enterprise para que um técnico o ajude por telefone. A Hewlett Packard Enterprise especifica nos materiais fornecidos com a peça CSR de reposição se a peça com defeito deve ser devolvida à Hewlett Packard Enterprise. Nos casos em que isso for necessário, é preciso enviar a peça com defeito à Hewlett Packard Enterprise, você deverá enviar a peça com defeito de volta para a Hewlett Packard Enterprise dentro do período de tempo definido, normalmente em 5 (cinco) dias úteis. A peça com defeito deve ser enviada com a documentação correspondente no material de transporte fornecido. Caso não o faça, a Hewlett Packard Enterprise poderá cobrar a reposição. Para as peças de reparo feito pelo cliente, a Hewlett Packard Enterprise paga todas as despesas de transporte e de devolução da peça e determina a transportadora/serviço postal a ser utilizado.

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修理時間を短縮し、故障部品の交換における高い柔軟性を確保するために、Hewlett Packard Enterprise製品には多数のカスタマーサービスリペア（CSR）部品があります。診断の際に、CSR部品を使用すれば修理ができるとHewlett Packard Enterprise（Hewlett Packard EnterpriseまたはHewlett Packard Enterprise正規保守代理店）が判断した場合、Hewlett Packard Enterpriseはその部品を直接、お客様に送付し、お客様に交換していただきます。CSR部品には以下の2種類があります。

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客戶自行維修

Hewlett Packard Enterprise 產品提供許多客戶自行維修 (CSR) 零件，以盡可能縮短維修時間和在更換缺陷部件時提供更大的靈活性。如果在診斷期間 Hewlett Packard Enterprise（或 Hewlett Packard Enterprise 服務供應商或服務合作伙伴）確定可通過使用 CSR 零件完成修復，Hewlett Packard Enterprise 將直接把該部件發送給您進行更換。有兩類 CSR 零件：

- 強制性的 — 要求客戶必須自行維修的零件。如果您請求 Hewlett Packard Enterprise 更換這些零件，則必須為該服務支付差旅費和人工費用。
- 可選的 — 客戶可以選擇是否自行維修的零件，這些部件也是為客戶自行維修設計的。不過，如果您要求 Hewlett Packard Enterprise 为您更换这些部件，则根据为您的产品指定的保修服务类型，Hewlett Packard Enterprise 可能收取或不再收取任何附加费用。

注：某些 Hewlett Packard Enterprise 零件的设计并未考虑客户自行维修。为了满足客户维修的需求，Hewlett Packard Enterprise 要求授权服务提供商更换相关部件。这些部件在部件图谱目录中标记为“否”。

CSR 部件将在下一个工作日发货（取决于备货情况和允许的地理范围）。在允许的地理范围内，可在当天或隔天内发货，但要收取额外费用。如果需要帮助，您可以致电 Hewlett Packard Enterprise 技术支持中心，将会有技术人员通过电话为您提供帮助。Hewlett Packard Enterprise 会在收到的 CSR 部件发货的材料中指出是否必须将有缺陷的部件返还给 Hewlett Packard Enterprise。如果要求将有缺陷的部件返还给 Hewlett Packard Enterprise，则您必须在收到日期内（通常为五 (5) 个工作日在收到此部件之后，将缺陷部件发给 Hewlett Packard Enterprise。有缺陷的部件必须随所发送的返修材料中相关文件一起返还。如果未能将有缺陷的部件，Hewlett Packard Enterprise 可能会要求您支付更換費用。客户自行维修时，Hewlett Packard Enterprise 将承担所有相关运输费用并指定快递商/承运商。

有关 Hewlett Packard Enterprise 客户自行维修计划的详细信息，请与您当地的客户服务提供商联系。有关北美地区的计划，请访问 Hewlett Packard Enterprise 网站 (http://www.hpe.com/support/selfrepair)。

備註：某些 Hewlett Packard Enterprise 零件沒有消費者可自行維修的設計。為符合客戶保固，Hewlett Packard Enterprise 需要授權的服務供應商更換零件。這些零件在顯示的零件目錄中，被標示為「否」。

客戶自行維修

Hewlett Packard Enterprise 產品設計了許多「客戶自行維修」(CSR) 的零件以減少維修時間，並且使得更換缺陷零件時能有更大的彈性。如果在診斷期間，Hewlett Packard Enterprise（或 Hewlett Packard Enterprise 服務供應商或維修夥伴）辨認出其維修工作可以藉由使用 CSR 零件來完成，則 Hewlett Packard Enterprise 將直接寄送該零件給您作更換。CSR 零件分為兩種類別：

- 強制的 — 客戶自行維修所使用的零件是強制性的。如果您要求 Hewlett Packard Enterprise 更換這些零件，Hewlett Packard Enterprise 將會要求您收取此服務所需的額外費用。
- 選購的 — 客戶自行維修所使用的零件是選購的。這些零件也設計用於客戶自行維修之用。不過，如果您的要求 Hewlett Packard Enterprise 您更換，則可能需要也可能不需要貢獻額外的費用。詳細刊登在本小節行情的保固服務類型上。

備註：某些 Hewlett Packard Enterprise 零件沒有消費者可自行維修的設計。為符合客戶保固，Hewlett Packard Enterprise 需要授權的服務供應商更換零件。這些零件在顯示的零件目錄中，被標示為「否」。

基於材料取得及環境允許的情況下，CSR 零件將於下一個工作日可退郵寄送。在允許下當天或四小時內運送，則可能需要額外的費用。若您需要協助，可致電 Hewlett Packard Enterprise 支援中心，會有維修人員透過電話來協助您。不論損壞的零件是否必须退回，Hewlett Packard Enterprise 皆會在收到 CSR 代辦郵件發送補償的材料中註明。若破損的零件退回 Hewlett Packard Enterprise，您必須在指定的一段時間內（通常為五 (5) 個工作日），將損壞的零件寄回 Hewlett Packard Enterprise。損壞的零件必須與寄送資料中隨附的相關技術文件一併退回。如果無法退回損壞的零件，Hewlett Packard Enterprise 可能會向您收取額外費用。針對客戶自行維修情形，Hewlett Packard Enterprise 將負擔所有費用及零件退還費用，並指定使用何家快速/速遞公司。

如需 Hewlett Packard Enterprise 的 CSR 方案詳細資訊，請連絡您當地的服務供應商。至於北美方案，請參閱 Hewlett Packard Enterprise 的 CSR 網站 repair (http://www.hpe.com/support/selfrepair)。
Remote support

Remote support is available with supported devices as part of your warranty or contractual support agreement. It provides intelligent event diagnosis, and automatic, secure submission of hardware event notifications to Hewlett Packard Enterprise, which will initiate a fast and accurate resolution based on your product's service level. Hewlett Packard Enterprise strongly recommends that you register your device for remote support.

For more information and device support details, go to the Insight Remote Support website (http://www.hpe.com/info/insightremotesupport/docs).
Hewlett Packard Enterprise is committed to providing documentation that meets your needs. To help us improve the documentation, send any errors, suggestions, or comments to Documentation Feedback (mailto:docsfeedback@hpe.com). When submitting your feedback, include the document title, part number, edition, and publication date located on the front cover of the document. For online help content, include the product name, product version, help edition, and publication date located on the legal notices page.
Acronyms and abbreviations

DF
DirectFlow

DHCP
Dynamic Host Configuration Protocol

EEPROM
electrical erasable programmable read only memory

FCC
Federal Communications Commission

GMT
Greenwich mean time

HTTPS
hypertext transfer protocol secure sockets

IPv4
Internet Protocol version 4

IPv6
Internet Protocol version 6

MIB
management information base

NTP
network time protocol

OCP
over current protection

OVP
over voltage protection

PFC
power factor corrected
POST
Power-On Self Test

REPO
remote emergency power off

THD
total harmonic distortion

UPS
uninterruptible power system
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