RETIRED: This document has been officially retired, and the base products listed herein are now considered obsolete and are no longer available for sale. Consequently, the information contained within may no longer be current. This document is provided exclusively for reference and informational purposes.

QuickSpecs

Overview

Is backup power creating cost and space issues in your data center racks?

The HPE DirectFlow (DF) Uninterruptible Power System (UPS) is a scalable and modular UPS that provides a high-density backup power solution for Hewlett Packard Enterprise servers and storage. It features a separate power management unit that integrates the major stages of an UPS - charger, inverter and active filter - into a single compact unit that dramatically reduces both size and cost when compared to a traditional UPS. The DirectFlow UPS provides up to 15kVA (3U) or 19.9kVA (5U) of power, utilizing 1U (Lithium-Ion) or 3U (Valve Regulated Lead Acid) battery pack options. HPE's DirectFlow UPS technology creates a highly efficient backup power solution by removing the active front-end AC/DC power conversion steps, delivering an efficiency exceeding 99%. DirectFlow UPS technology also includes integrated Active Current Correction that enables power factor closer to unity in low-load conditions, providing clean power that ultimately lowers your power costs.

Power Unit (1U UPS)

NOTE: #0D1 will appear after the part number on the sales order if HPE factory integration is indicated.

HPE R12000 DirectFlow - 1U Rackmount Uninterruptible Power System G9Y75A

HPE R12000 DirectFlow - POD 1U Rackmount Uninterruptible Power System AF478A

Input/Output Module Options for 1U UPS– Choose one I/O Module per UPS

NOTE: #0D1 will appear after the part number on the sales order if HPE factory integration is indicated.

HPE 32A 400-415 Volt Three Phase INTL R12000 DirectFlow UPS IEC309 Input/Output Module AF488A

HPE 30A 400-415 Volt Three Phase NA R12000 DirectFlow UPS POD IEC309 Input/Output Module AF489A

HPE 32A 380 Volt Three Phase China R12000 DirectFlow UPS Unterminated Input/Output Module AF490A

HPE 30A 480 Volt Three Phase NA R12000 DirectFlow UPS L22-30 Input/Output Module AF491A

HPE 30A 480 Volt Three Phase NA R12000 DirectFlow UPS IEC309 Input/Output Module AF492A

HPE 30A 400-415 Volt Three Phase NA R12000 DirectFlow UPS IEC309 Input/Output Module G9Y76A

NOTE:NOTE: All Input/Output Modules support dual output outlets except the AF484A.

Power Unit (2U UPS)

NOTE: #0D1 will appear after the part number on the sales order if HPE factory integration is indicated.

HPE R18000 DirectFlow - 2U Rackmount Uninterruptible Power System AF479A

Overview

Input/Output Module Options for 2U UPS– Choose one I/O Module per UPS

NOTE: #0D1 will appear after the part number on the sales order if HPE factory integration is indicated.

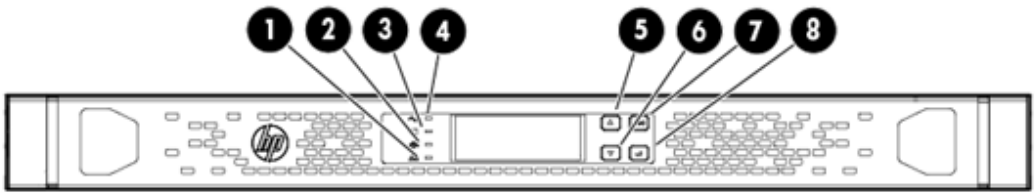
HPE 32A 400-415 Volt Three Phase INTL R18000 DirectFlow UPS IEC309 I/O Module	AF483A
HPE 30A 380 Volt Three Phase China R18000 DirectFlow UPS Unterminated I/O Module	AF485A
HPE 30A 480 Volt Three Phase NA DirectFlow UPS NEMA L22-30 I/O Module	AF486A
HPE 30A 480 Volt Three Phase NA R18000 DirectFlow UPS IEC309 Input/Output Module	AF487A
HPE 30A 400-415V Three Phase NA R18000 DirectFlow UPS IEC309 Input/Output Module	D9Q02A
HPE 30A 400-415V Three Phase NA R18000 DirectFlow UPS 1:1 IEC309 I/O Module NOTE:NOTE: All Input/Output Modules support dual output outlets except the AF484A.	AF484A

Battery Pack Options - Choose up to two Battery Packs per UPS (must be the same)

NOTE: #0D1 will appear after the part number on the sales order if HPE factory integration is indicated.

HPE DirectFlow UPS - 1U Rackmount Lithium-ion Battery Pack	AF480A
HPE DirectFlow UPS - 3U Rackmount VRLA Battery Pack	AF482A

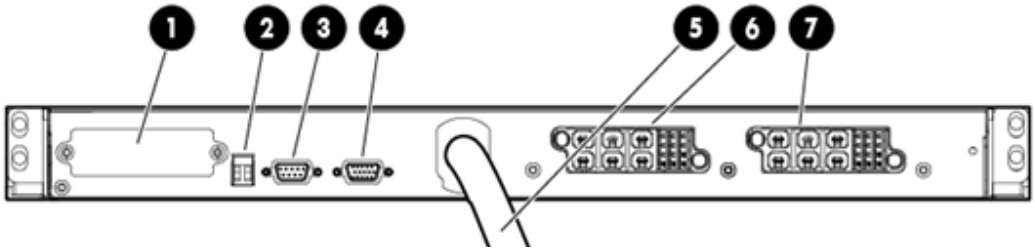
HPE R12000 DirectFlow UPS (front panel)



1	UPS fault LED	5	Up arrow
2	Bypass mode LED	6	Down arrow
3	Battery mode LED	7	Off/ESC/Clear fault button
4	Input LED	8	On/Enter button

HPE R12000 DirectFlow UPS (rear panel)

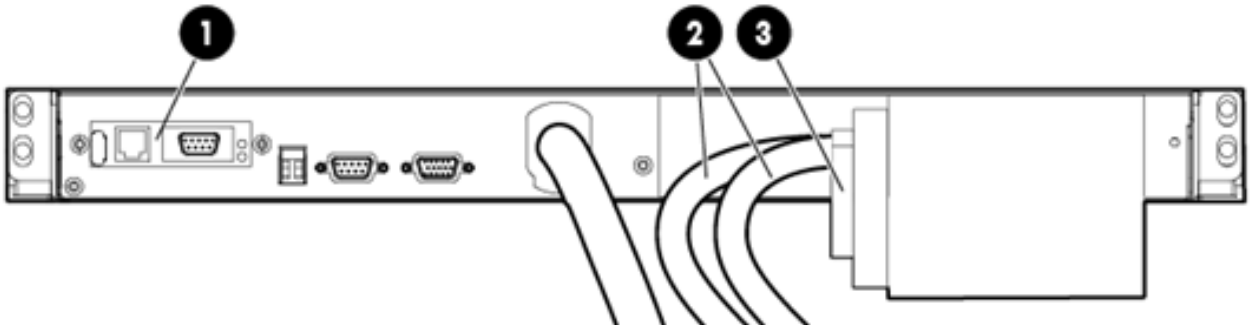
Overview



1	Cover plate for option slot	5	Battery pack power cable
2	REPO port	6	I/O power module connection
3	DB-9 serial port (firmware upgrade)	7	I/O power module connection
4	DB-15 port (CAN Bus cable)		

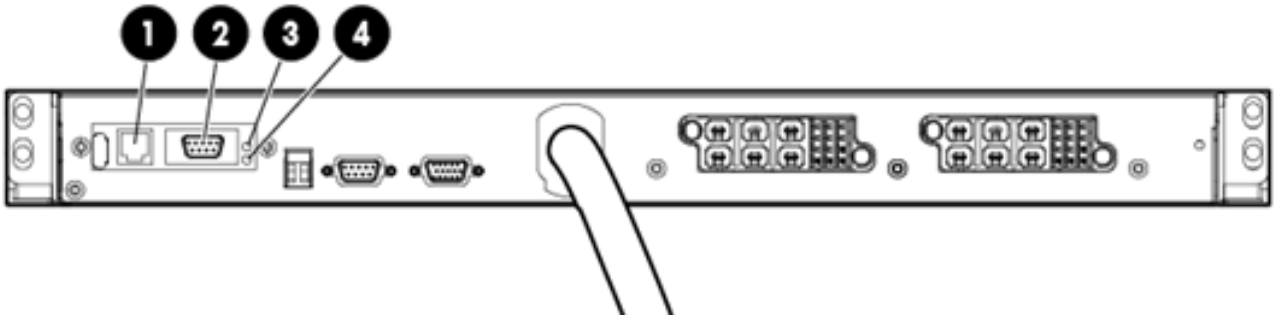
Overview

HPE R12000 DirectFlow UPS
(rear panel with UPS Management Card and I/O Module installed)



1 HPE DirectFlow UPS Management Module card
2 HPE DirectFlow Input/Output Power Module switch
3 HPE DirectFlow Input/Output Power Module connection and cables

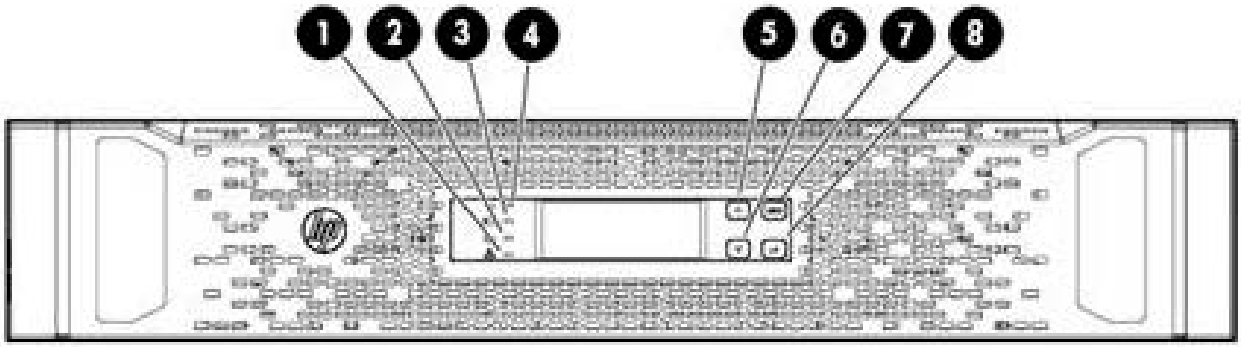
HPE R12000 DirectFlow UPS
(rear panel with UPS Management Card installed, no I/O module)



1 RJ-45 for network or Ethernet communications
2 DB-9 serial port for configuration and flashing card firmware
3 Power LED
4 Health/Alert LED

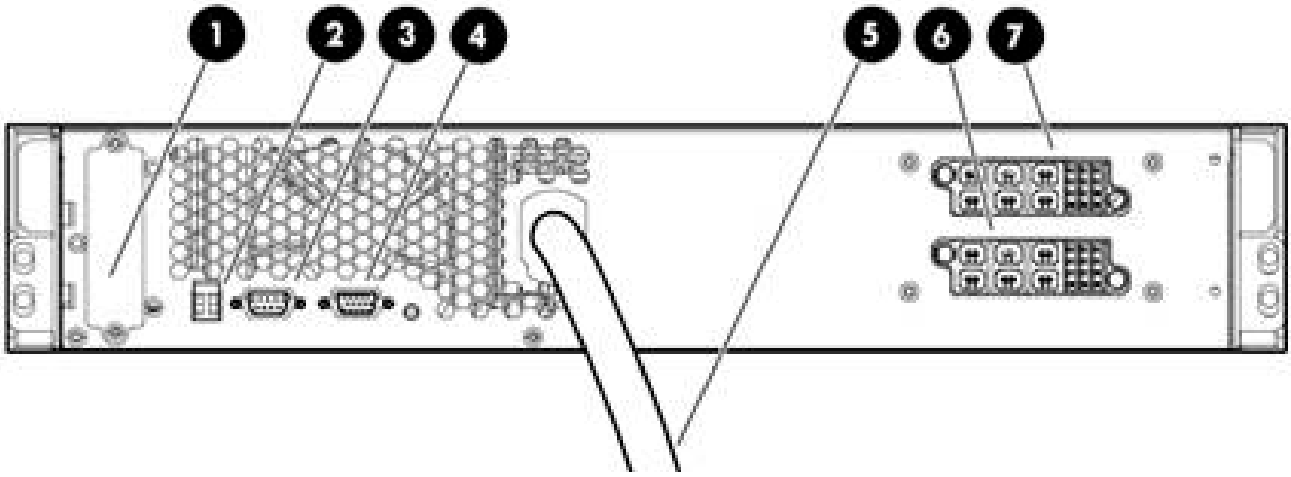
Overview

HPE R18000 DirectFlow UPS (front panel)



1 UPS fault LED
2 Bypass mode LED
3 Battery mode LED
4 Input LED
5 Up arrow
6 Down arrow
7 Off/ESC/Clear fault button
8 On/Enter button

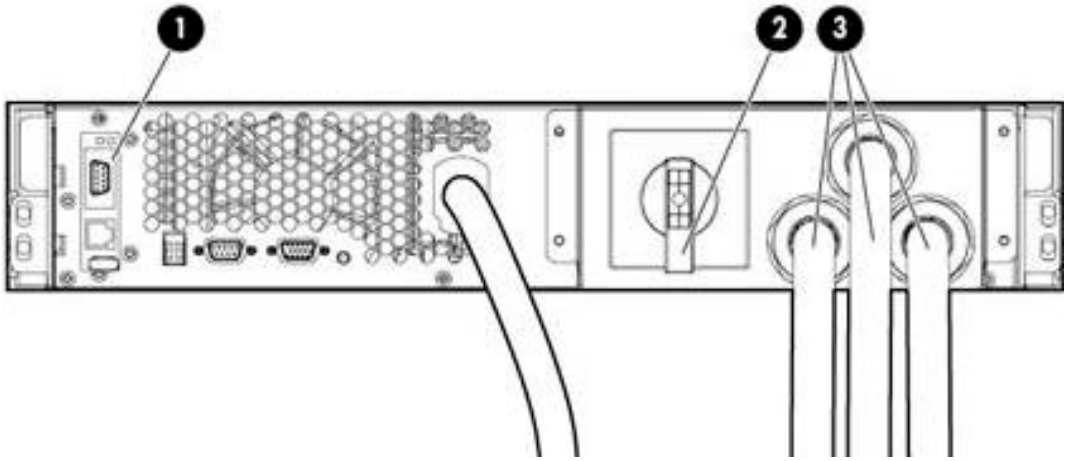
HPE R18000 DirectFlow UPS (rear panel)



1 Cover plate for option slot
2 REPO port
3 DB-9 serial port (firmware upgrade)
4 DB-15 port (CAN Bus cable)
5 Battery pack power cable
6 I/O power module connection
7 I/O power module connection

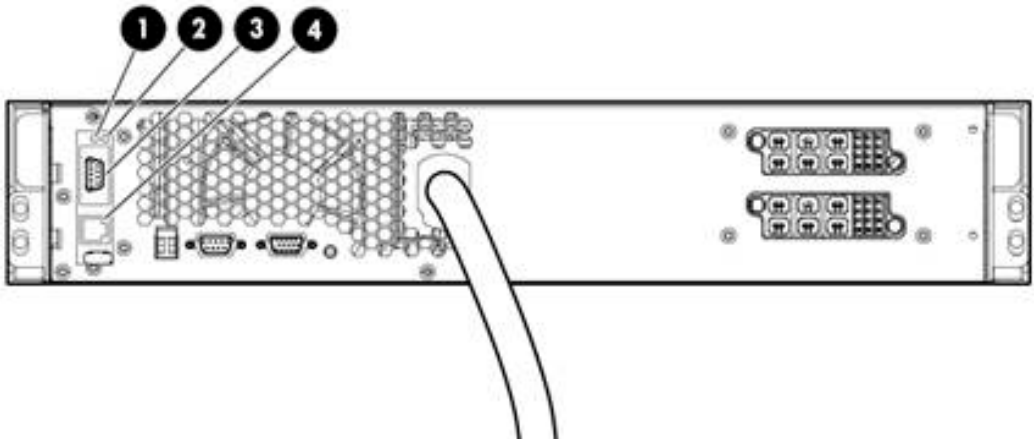
Overview

HPE R18000 DirectFlow UPS
(rear panel with UPS Management Card and I/O Module installed)



1 UPS Management Module card
2 Input/Output Power Module switch
3 Input/Output Power Module connection and cables

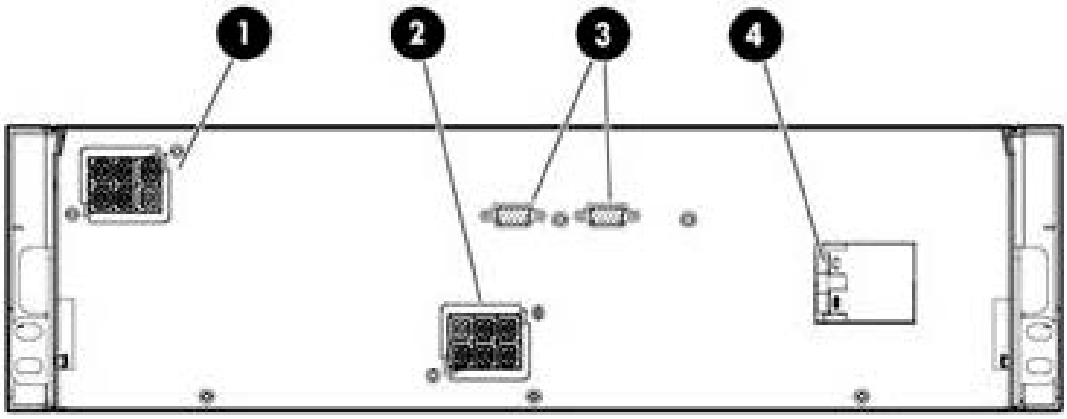
HPE R18000 DirectFlow UPS
(rear panel with UPS Management Card installed, no I/O module)



1 Power LED
2 Health/Alert LED
3 DB-9 serial port (configuration/firmware upgrade)
4 RJ-45 (Network/Ethernet communications)

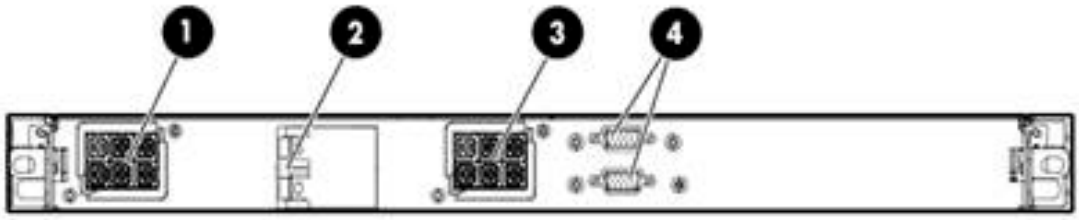
Overview

3U Battery Pack (VRLA)



1 DC to DC power cable connector (power unit)
2 DC to DC power cable connector (battery pack)
3 DB-15 ports (CAN Bus cables for battery pack communication)
4 Circuit breaker switch

1U Battery Pack (Li-ion)



1 DC to DC power cable connector (power unit)
2 Circuit breaker switch
3 DC to DC power cable connector (battery pack)
4 DB-15 ports (CAN Bus cables for battery pack communication)

Standard Features

Key Features and Benefits

Modular And Scalable Design Creates High Density Backup Power Solution

- Separate power management unit that integrates the major stages of an UPS - charger, inverter and active filter - into a single compact unit that dramatically reduces both size and cost when compared to a traditional UPS
- High power density solution that provides up to 19.9kVA in a 5U space and as much as 12kVA in a 2U space
- Increase system runtime by 3x with parallel able 1U (Lithium-Ion) and 3U (Valve Regulated Lead Acid) battery pack options
- Modular input/output modules accommodate different regional input voltage requirements using the same power management unit and battery options worldwide

Highly Efficient Backup Power Solution That Lowers Your Total Cost Of Ownership

- Utilizes an advanced technology that removes the active front-end AC/DC power conversion steps and delivers power efficiency exceeding 99%
- Integrates Active Current Correction (ACC) technology that enables power factor closer to unity in low-load conditions, ultimately lowering the data center power bill
- Utilizes Digital Signal Processing (DSP) technology that continually conditions and regulates power without using the battery, thereby increasing the life of the battery

Flexible Design Allows for Simple Configuration, Management, and Maintenance

- Easy configuration and user-friendly operation supported through an enhanced LCD display and remote web-based management capabilities
- Separation of power management unit and battery creates a distributed backup power solution with no single point of failure
- Hot-swappable power management unit and battery modules that include a Modular Bypass mode that allows loads to be continuously powered while servicing the UPS

High Power Density

Up to 6kVA of power per U of rack space:

- 19.9kVA in 5U space = 2U DirectFlow UPS + 3U VRLA Battery option
- 15kVA in 3U space = 2U DirectFlow UPS + 1U Li-Ion Battery option
- 12kVA in 2U space = 1U DirectFlow UPS + 1U Li-Ion Battery option

Innovative Technology Drives Lower TCO

- HPE DirectFlow technology creates a highly efficient backup power solution by removing the active front-end AC/DC power conversion steps, delivering an efficiency exceeding 99%
- Integrated Active Current Correction technology enables power factor closer to unity in low-load conditions, providing clean power that ultimately lowers your power costs
- Includes HPE exclusive battery management software that helps to extend the service life of the battery

Better Reliability

- Innovative design enables efficient management of unbalanced loads
- Able to detect and handle generator input on programming, making efficient use of available power for load and charging when required
- Programmable runtime limits, input types, and charging output power

Standard Features

HPE Battery Management	The DirectFlow UPS communicates with the battery management system to learn the voltages and states of charge for each battery module. The helps the UPS to better understand the condition and usability of the battery, and informs the user when it is time for the battery to be serviced.
UPS/Battery Monitoring	The DirectFlow UPS provides both a serial communications port (RS232) and CAN bus for local connection to the UPS and battery modules. Remote monitoring is also supported via two methods: • Optional UPS Management Card (internal) • Optional Advanced Power Manager (APM) Kit (external)
Compatibility	Compatible with all HPE V142, 11000G2 and Intelligent Series Racks, as well as with all HPE Power Distribution Units (PDUs), servers, networking and storage products.
Warranty	HPE R12000 and R18000 DirectFlow UPS and I/O Module options: covered by a three year warranty (3/1/1), with the first year including parts and labor. HPE DirectFlow 1U Battery Module (Li-Ion): covered by a four year warranty (4/1/1), with the first year including parts and labor. HPE DirectFlow 3U Battery Module (VRLA): covered by a two year warranty (2/1/1), with the first year including parts and labor.

Service and Support

Service and Support

NOTE: HPE DirectFlow 1U Uninterruptible power system is supported as a part of the HPE Server Infrastructure. No separate HPE Care Packs needs to be purchased. The Support recommendation listed below are only for the 2U UPS.

HPE Technology Services for Industry Standard Servers
HPE Technology Services delivers confidence, reduces risk and helps customers realize agility and stability. Connect to HPE to help prevent problems and solve issues faster. Our support technology lets you to tap into the knowledge of millions of devices and thousands of experts to stay informed and in control, anywhere, any time.

Protect your business beyond warranty with HPE Pointnext operational services
HPE Pointnext operational services enable you to order the right service level, length of coverage and response time as you purchase your new server, giving you full entitlement for the term you select.

Recommended HPE Pointnext operational services for 2U Uninterruptible Power System

Optimized Care

Supports maintaining servers at optimum performance availability

HPE Proactive Care Advanced – Call to Repair, three year Care Pack Service
Achieve a higher return on your product investment with the personal attention from a locally assigned Account Support Manager who delivers recommendations designed to improve availability and performance. Leverage your system's ability to connect to HPE for automated problem detection and rapid critical event management to increase stability and reduce unplanned downtime. This recommendation provides a local customer engineer for onsite hardware repair if required within 6 hours and two-hour callback for supported software. Collaborative call management comes with Proactive Care Advanced or you may choose full support from HPE where we own all cases through to resolution.
https://www.hpe.com/h20195/V2/GetDocument.aspx?docname=4AA5-3259ENW&cc=us&lc=en

Standard Care

Supports maintaining high level of server availability

HPE Proactive Care with 6 hour call-to-repair commitment, three year Care Pack Service
HPE Proactive Care helps prevent problems and stabilize IT by utilizing secure, real-time, predictive analytics and proactive consultations when your products are connected to HPE. This Care Pack Service combines three years' proactive reporting and advice with our highest level reactive coverage and enhanced escalation management, HPE's 24x7, six hour call-to-repair hardware commitment. Hewlett Packard Enterprise is the only leading manufacturer who makes this level of coverage available as a standard service offering for your most valuable servers. Service includes 24x7 collaborative software support for leading industry standard software running on your HPE ProLiant server.
https://www.hpe.com/h20195/v2/GetPDF.aspx/4AA3-8855ENW.pdf

Basic Care

Supports maintaining minimum level of server availability

Foundation Care 24x7, three-year Care Pack Service
HPE Foundation Care 24x7 connects you to HPE 24 hours a day, seven days a week for assistance on resolving issues. Hardware onsite response within four hours if needed; collaborative software included in this Care Pack service provides troubleshooting assistance on industry leading software running on your HPE server. Simplify your support experience and make HPE your first call for hardware or software questions.
https://www.hpe.com/h20195/V2/GetDocument.aspx?docname=4AA4-8876ENW&cc=us&lc=en

Get connected to HPE to Connecting products to Hewlett Packard Enterprise will help prevent problems with 24x7monitoring,

Service and Support

improve your support experience

prefailure alerts, automatic call logging, and parts dispatch, plus current data will be available for the proactive reports that are part of Proactive Care Services. With Connected products, you can have a dashboard to manage your IT anywhere, anytime, from any device.

Parts and materials

Hewlett Packard Enterprise will provide HPE-supported replacement parts and materials necessary to maintain the covered hardware product in operating condition, including parts and materials for available and recommended engineering improvements.

Parts and components that have reached their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual, product quick-specs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by Hewlett Packard Enterprise due to malfunction.

Coverage

Coverage of the UPS battery is not included beyond the term of the UPS warranty; standard warranty terms and conditions apply.

For more information

To learn more on services for HPE ESSN Options, please contact your Hewlett Packard Enterprise sales representative or Hewlett Packard Enterprise Authorized Channel Partner. Or visit: **http://www.hp.com/services/proliant** or **http://www.hp.com/services/bladesystem**

Related Options

HPE DirectFlow UPS Options

NOTE: #0D1 will appear after the part number on the sales order if HPE factory integration is indicated.

HPE DirectFlow UPS Battery Options	HPE DirectFlow UPS - 1U Rackmount Lithium-ion Battery Pack	AF480A
	HPE DirectFlow UPS - 3U Rackmount VRLA Battery Pack NOTE:NOTE: Primary and secondary batteries used in the DirectFlow UPS must be the same type.	AF482A
R12000 1U I/O Module Options	HPE 32A 400-415 Volt Three Phase INTL R12000 DirectFlow UPS IEC309 Input/Output Module	AF488A
	HPE 30A 400-415 Volt Three Phase NA R12000 DirectFlow UPS POD IEC309 Input/Output Module	AF489A
	HPE 32A 380 Volt Three Phase China R12000 DirectFlow UPS Unterminated Input/Output Module	AF490A
	HPE 30A 480 Volt Three Phase NA R12000 DirectFlow UPS L22-30 Input/Output Module	AF491A
	HPE 30A 480 Volt Three Phase NA R12000 DirectFlow UPS IEC309 Input/Output Module	AF492A
	HPE 30A 400-415 Volt Three Phase NA R12000 DirectFlow UPS IEC309 Input/Output Module	G9Y76A
R18000 2U I/O Module Options	HPE 32A 400-415 Volt Three Phase INTL R18000 DirectFlow UPS IEC309 I/O Module	AF483A
	HPE 30A 380 Volt Three Phase China R18000 DirectFlow UPS Unterminated I/O Module	AF485A
	HPE 30A 480 Volt Three Phase NA DirectFlow UPS NEMA L22-30 I/O Module	AF486A
	HPE 30A 480 Volt Three Phase NA R18000 DirectFlow UPS IEC309 Input/Output Module	AF487A
	HPE 30A 400-415V Three Phase NA R18000 DirectFlow UPS IEC309 Input/Output Module	D9Q02A
	HPE 30A 400-415V Three Phase NA R18000 DirectFlow UPS 1:1 IEC309 I/O Module NOTE:NOTE: All Input/Output Modules support dual output outlets except the AF484A.	AF484A
Secondary Battery Cable	HPE WW DirectFlow Secondary Battery Cable NOTE:NOTE: Required when adding a secondary battery to either the R12000 or R18000 DirectFlow UPS.	AF497A

Related Options

UPS Management Card (Internal)	HP DirectFlow UPS Management Card	AF493A
UPS Management Card (External)	HP SL Advanced Power Manager Kit	538084-B21

NOTE: HPE Comm Micro DB9F/DB9M Cable (E2D31A) required when using this external UPS management card.

External UPS Management Cable Kit	HP Communication Micro DB9 Female to DB9 Male Black 3.0m 1-pack Serial Cable	E2D31A

NOTE: Cable kit required when HPE SL Advanced Power Manager Kit (538084-B21) is used with R18000 UPS.

Maximum Output Power

UPS Model	Input/Output Module	Max Power (kVA) - VRLA Battery	Max Power (kVA) Li-Ion Battery
HPE R12000 1U Direct Flow UPS	HPE 32A 400-415 Volt Three Phase INTL R12000 DirectFlow UPS IEC309 Input/Output Module	12000	12000
	HPE 30A 400V NA R12000DF IEC309 POD Mod	12000	12000
	HPE 32A 380 Volt Three Phase China R12000 DirectFlow UPS Unterminated Input/Output Module	12000	12000
	HPE 30A 480 Volt Three Phase NA R12000 DirectFlow UPS L22-30 Input/Output Module	12000	12000
	HPE 30A 480 Volt Three Phase NA R12000 DirectFlow UPS IEC309 Input/Output Module	12000	12000
	HPE 30A 400-415 Volt Three Phase NA R12000 DirectFlow UPS IEC309 Input/Output Module	12000	12000
HPE R18000 2U Direct Flow UPS	HPE 32A 400-415 Volt Three Phase INTL R18000 DirectFlow UPS IEC309 Input/Output Module	19900	15000
	HPE 30A 380 Volt Three Phase China R18000 DirectFlow UPS Unterminated Input/Output Module	19900	15000
	HPE 30A 480 Volt Three Phase NA R18000 DirectFlow UPS L22-30 Input/Output Module	19900	15000
	HPE 30A 480 Volt Three Phase NA R18000 DirectFlow UPS IEC309 Input/Output Module	19900	15000
	HPE 30A 400 Volt Three Phase NA R18000 DirectFlow UPS IEC309 Input/Output Module	19900	15000
	HPE 30A 400-415V Three Phase NA R18000 DirectFlow UPS 1:1 IEC309 Input/Output Module	19900	15000

Estimated Runtime (Minutes)

R12000 Runtime with 3U VRLA Battery Pack			
Load (kVA)	**Load % (3UBP)**	**Minimum Minutes (1 B:P)**	**Minimum Minutes (2 BPs Parallel)**
12	100	4:21	12:53
9	75	6:56	19:04
6	50	11:25	31:32
3	25	29:35	71:22

R18000 Runtime with 3U VRLA Battery Pack			
Load (kVA)	**Load % (3UBP)**	**Minimum Minutes (1 B:P)**	**Minimum Minutes (2 BPs Parallel)**
4.5	25.00	13	42
9	50.00	7	18
12	66.67	4	13
13.5	75.00	4	11
15	83.33	3	10
17.7	98.33	2	8
18	100.00	2	7

R18000 Runtime with 1U Lithium Ion Battery Pack			
Load (kVA)	**Load % (1UBP)**	**Minimum Minutes (1 BP)**	**Minimum Minutes (2 BPs Parallel)**
3.75	25	9	21
7.5	50	5	10
11.25	75	2	6
12	80	2	6
15	100	1	5

NOTE: Runtimes may change based on aging of the batteries and ambient temperature. Runtimes shown here are conservative values based on test results.

Technical Specifications

HPE R12000 DirectFlow 1U UPS

BTU Break Down Based on efficiency of unit on battery	**BTU On Battery with VRLA Battery Option**	AC Mode Efficiency = 0.94 DC Mode Efficiency = 0.91 Output Power = 12000 W AC Mode without charging = 2611.91 BTU/hr Battery Mode = 4047.03 BTU/hr
	BTU On Battery with Li-Ion Battery Option	AC Mode Efficiency = 0.94 DC Mode Efficiency = 0.90 Output Power 12000W AC Mode without charging = 2611.11 BTU/hr. Battery Mode = 4546.67 BTU/hr.
	Battery String Voltage	432V (VRLA), 376V (Li-Ion)
	Battery Type	12V 3.5Ah (VRLA), 4.1V, 1.5Ah (Li-Ion)
	Battery Quantity	4 strings with 9 batteries per string (VRLA) per battery tray, 8 modules in series with 12 2-parallel cells in series (Li-Ion) per battery tray.
Electrical Input	**Voltage Range**	480/415/400/380V +10/-15% (Wye)
	Frequency	50/60 Hz
	Input Plug	I/O module with IEC 309 32P/ IEC 309 32R, IEC 309 20P, IEC 309 20R, NEMA L22 30P/ NEMA L22 30C plug depending on operating voltage. The I/O module has one input plug and one output receptacle.
	Online Efficiency	>94%
	REPO	Remote Emergency Power-Off disables AC power to load
Electrical Output	**Voltage Range**	480/415/400/380V Wye Line to Line (277/240/230/220V Wye Line to Neutral)
	Online Regulation	±5% of nominal voltage
	On-Battery Regulation	±5% of nominal voltage
	Voltage Wave Form	Sine wave
	Connections	I/O module with IEC 309 32P/ IEC 309 32R, IEC 309 20P, IEC 309 20R, NEMA L22 30P/ NEMA L22 30C plug depending on operating voltage. The I/O module has one input plug and one output receptacle.
	Output Protection	Overcurrent and short circuit protection through output current feedback. Inverter and output SCRs, Inverter fuses.
Battery	**Type**	Maintenance-free, sealed, valve-regulated lead acid (VRLA); Lithium-Ion Phosphate (Li-Ion)
	Extended Batteries	Up to two battery packs in parallel supported – must be the same type of battery
	Backup Time	See Estimated Runtime chart
	Recharge Time	<1 hours to 80% usable capacity; <4 hours for complete recharge for Li-Ion; <3 hours to 80% and <24 hours for complete recharge for VRLA batteries
	Battery Voltage	432V (VRLA), 376V (Li-Ion)
	Battery Type	12V 3.5Ah (VRLA), 4.1V, 1.5Ah (Li-Ion)
	Battery Quantity	4 strings with 9 batteries per string (VRLA) per battery tray; 8 modules in series with 12 2-parallel cells in series (Li-Ion) per battery tray.
Maximum Power	**With VRLA Battery** **With Li-Ion Battery**	12000VA 12000VA
Communications	**Serial Ports**	Standard DB-9 port and DB-15 CAN port

Technical Specifications

	Optional	HPE UPS Management Module Card (Internal) HPE Advanced Power Manager (External)
	LCD/LED Indicators	LCD screen with two scroll buttons, one ESC and one RETURN button. 4 LEDs (AC Input On, Battery Mode On, Manual Bypass On, and Fault)
Environmental and Safety	**Operating Temperature**	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8F° per every 1000 ft.) above sea level to a maximum of 3050 m (10,000 ft.), no direct sustained sunlight. Maximum rate of change is 10°C/hr. (18°F/hr.). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 30°C (86°F). **NOTE:** Operating temperature assumes rated load and nominal utility.
	Transit Temperature	-25° to 60° C
	Storage Temperature	-25° to 55° C
	Operating Humidity	5 - 95 %, Non-condensing
	Storage Humidity	5 - 95 %, Non-condensing
	Operating Altitude	10,000 ft. above sea level
	Transit Altitude	30,000 ft. above sea level
	Safety Markings	NA: UL, cUL International: TUV, CE
	Safety Certifications	UL1778, UL60950-1; CSA22.2 No.107.3-05, EN60950-1 IEC62040-1
	EMC Markings	NA/JPN: FCC, VCCI, ICES, CISPR International: CISPR
	Emissions	FCC CFR 47, Part 15 Class A, ; EN62040-2
	REPO Port	Meets NEC code 645-11 intent and UL requirements
Status Indicator	**On/Enter button**	Press the button for 3 seconds to turn the UPS on; press the button to confirm setup or menu entries
	UPS fault LED	Red light indicates a fault; no light indicates proper function
	Bypass mode LED	Green light indicates Bypass mode; no light indicates AC mode
	Battery mode LED	Yellow light indicates Battery mode; flashing indicates low battery
	Input LED	Green light indicates that the power input is adequate
	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
Kit Contents	**Power Unit (UPS)**	HPE R12000 DirectFlow 1U UPS unit; documentation; depth adjustable fixed rack mounting rails, mounting brackets; Front bezel
	I/O Modules	HPE DirectFlow 1U I/O Module; documentation

HPE R18000 DirectFlow 2U UPS

BTU Break Down Based on efficiency of unit on battery	**BTU On Battery with VRLA Battery Option**	AC Mode Efficiency = 0.98 DC Mode Efficiency = 0.91 Output Power = 19944 W AC Mode without charging = 1388 BTU/hr Battery Mode = 6726 BTU/hr
	BTU On Battery with	AC Mode Efficiency = 0.98

Technical Specifications

	Li-Ion Battery Option	DC Mode Efficiency = 0.90 Output Power 15000W AC Mode without charging = 1044 BTU/hr. Battery Mode = 5683 BTU/hr.
	Battery String Voltage	432V (VRLA), 376V (Li-Ion)
	Battery Type	12V 3.5Ah (VRLA), 4.1V, 1.5Ah (Li-Ion)
	Battery Quantity	4 strings with 9 batteries per string (VRLA) per battery tray, 8 modules in series with 12 2-parallel cells in series (Li-Ion) per battery tray.
Electrical Input	**Voltage Range**	480/415/380V +10/-15% (Wye)
	Frequency	50/60 Hz
	Input Plug	I/O module with IEC 309 32P/ IEC 309 32R, IEC 309 20P, IEC 309 20R, NEMA L22 30P/ NEMA L22 30C plug depending on operating voltage. The I/O module has one input plug and one output receptacle.
	Online Efficiency	>97%
	REPO	Remote Emergency Power-Off disables AC power to load
Electrical Output	**Voltage Range**	480/415/380V +10/-15% (Wye)
	Online Regulation	±5% of nominal voltage
	On-Battery Regulation	±5% of nominal voltage
	Voltage Wave Form	Sine wave
	Connections	I/O module with IEC 309 32P/ IEC 309 32R, IEC 309 20P, IEC 309 20R, NEMA L22 30P/ NEMA L22 30C plug depending on operating voltage. The I/O module has one input plug and one output receptacle.
	Output Protection	Overcurrent and short circuit protection through output current feedback. Inverter and output SCRs, Inverter fuses.
Battery	**Type**	Maintenance-free, sealed, valve-regulated lead acid (VRLA); Lithium-Ion Phosphate (Li-Ion)
	Extended Batteries	Up to two battery packs in parallel supported – must be the same type of battery
	Backup Time	See Estimated Runtime chart
	Recharge Time	<1 hours to 80% usable capacity; <4 hours for complete recharge for Li-Ion; <3 hours to 80% and <24 hours for complete recharge for VRLA batteries
	Battery Voltage	432V (VRLA), 376V (Li-Ion)
	Battery Type	12V 3.5Ah (VRLA), 4.1V, 1.5Ah (Li-Ion)
	Battery Quantity	4 strings with 9 batteries per string (VRLA) per battery tray; 8 modules in series with 12 2-parallel cells in series (Li-Ion) per battery tray.
Maximum Power	**With VRLA Battery** **With Li-Ion Battery**	19900VA 15000VA
Communications	**Serial Ports**	Standard DB-9 port and DB-15 CAN port
	Optional	HPE UPS Management Module Card (Internal) HPE Advanced Power Manager (External)
	LCD/LED Indicators	LCD screen with two scroll buttons, one ESC and one RETURN button. 4 LEDs (AC Input On, Battery Mode On, Manual Bypass On, and Fault).
Environmental and Safety	**Operating Temperature**	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8F° per every 1000 ft.) above sea level to a maximum of 3050 m (10,000 ft.), no direct sustained sunlight. Maximum rate of change is 10°C/hr. (18°F/hr.). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 30°C (86°F).

Technical Specifications

		NOTE: Operating temperature assumes rated load and nominal utility.
	Transit Temperature	-25° to 60° C
	Storage Temperature	-25° to 55° C
	Operating Humidity	5 - 95 %, Non-condensing
	Storage Humidity	5 - 95 %, Non-condensing
	Operating Altitude	10,000 ft. above sea level
	Transit Altitude	30,000 ft. above sea level
	Safety Markings	NA: UL, cUL International: TUV, CE
	Safety Certifications	UL1778, UL60950-1; CSA22.2 No.107.3-05, EN60950-1 IEC62040-1
	EMC Markings	NA/JPN: FCC, VCCI, ICES, CISPR International: CISPR
	Emissions	FCC CFR 47, Part 15 Class A, ; EN62040-2
	REPO Port	Meets NEC code 645-11 intent and UL requirements
Status Indicator	**On/Enter button**	Press the button for 3 seconds to turn the UPS on; press the button to confirm setup or menu entries
	UPS fault LED	Red light indicates a fault; no light indicates proper function
	Bypass mode LED	Green light indicates Bypass mode; no light indicates AC mode
	Battery mode LED	Yellow light indicates Battery mode; flashing indicates low battery
	Input LED	Green light indicates that the power input is adequate
	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
Kit Contents	**Power Unit (UPS)**	HPE R18000 DirectFlow 2U UPS unit; documentation; depth adjustable fixed rack mounting rails, mounting brackets; Front bezel
	I/O Modules	HPE DirectFlow 2U I/O Module; documentation
Environment-friendly Products and Approach	**End-of-life Management and Recycling**	Hewlett Packard Enterprise offers end-of-life Hewlett Packard Enterprise product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: **http://www.hp.com/go/green**. To recycle your product, please go to: **http://www.hp.com/go/green** or contact your nearest Hewlett Packard Enterprise sales office. Products returned to Hewlett Packard Enterprise will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard Enterprise web site at: **http://www.hp.com/go/green**. These instructions may be used by recyclers and other WEEE treatment facilities as well as HEWLETT PACKARD ENTERPRISE OEM customers who integrate and re-sell Hewlett Packard Enterprise equipment.

Summary of Changes

Date	Version History	Action	Description of Change
23-Oct-2017	Version 5	Added	Care Pack naming and Service and Support- Parts and Materials updated.
9-Sep-2016	From Version 3 to 4	Changed	Technical Specifications section was revised.
11-Dec-2015	From Version 2 to 3	Changed	Technical Specifications for eh HPE R12000 DirectFlow 1U UPS were revised.
09-Feb-2015	From Version 1 to 2	Changed	Overview, Standard Features, Service and Support, Related Options, Maximum Output Power, Estimated Runtime (Minutes), and Technical Specifications sections were revised. Title was changed from DirectFlow Uninterruptible Power System to HPE DirectFlow Three Phase Uninterruptible Power System.

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