Dell Unity™ All Flash and Unity Hybrid Unity 480/F, Unity 680/F, Unity 880/F Hardware Information Guide

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DELL Technologies

Notes, cautions, and warnings

NOTE: A NOTE indicates important information that helps you make better use of your product.

CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

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Additional resources

As part of an improvement effort, revisions of the software and hardware are periodically released. Therefore, some functions that are described in this document might not be supported by all versions of the software or hardware currently in use. The product release notes provide the most up-to-date information about product features. Contact your technical support professional if a product does not function properly or does not function as described in this document.

Where to get help

Support, product, and licensing information can be obtained as described below.

Product information

For product and feature documentation or release notes, go to Unity Technical Documentation at the Dell Unity Info Hub.

Troubleshooting

For information about products, software updates, licensing, and service, go to Dell Support (registration required). After logging in, locate the appropriate product page.

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DPE component descriptions

Topics:

- 2U, 25-drive DPE component overview
- DPE front view
- DPE rear view
- Storage processor assembly internal components

2U, 25-drive DPE component overview

The 25-drive DPE is two rack units (U), 8.9 cm (3.5 in.) high, 79.2 cm (31.2 in.) deep, and includes slots for twenty-five 2.5-in. drives.

The DPE consists of the following components:

- Drives
- Midplane
- Storage processor assembly
- Power supply module
- EMI shielding

Drives

Each drive consists of one drive in a carrier. The drive carriers are metal and plastic assemblies that provide smooth, reliable contact with the enclosure slot guides and midplane connectors. Each carrier has a handle with a latch and spring clips. The latch holds the drive in place to ensure proper connection with the midplane. Drive activity and fault LEDs are located on the front of the enclosure.

SAS and SAS flash drives are supported. The drives are populated in the system from left to right.

NOTE: The first four drive slots are reserved for system drives, and should not be removed.

You can visually distinguish between drive types by their different latch and handle mechanisms and by type, capacity, and speed labels on each drive. You can add or remove a drive while the DPE is powered on, but you should exercise special care when removing modules while they are in use. Drives are sensitive electronic components.

Midplane

The midplane separates the front-facing drives from the rear-facing SP assemblies. It distributes power and signals to all components in the enclosure. The SP assemblies and drives plug directly into the midplane.

Storage processor assembly

Each DPE contains two SP assemblies. The SP assembly is the intelligent component providing the compute capability of the DPE. Acting as the control center, each SP assembly includes status LEDs.

Storage processor assembly power supply module

Each SP assembly contains a power supply module that connects the system to an exterior power source. Redundant power supplies can keep the entire DPE running if one power supply fails. The power supplies include LEDs to indicate component status. A latch on the module locks it into place to ensure proper connection.

EMI shielding

EMI compliance requires a properly installed electromagnetic interference (EMI) shield in front of the DPE drives. When installed in cabinets that include a front door, the DPE includes a simple EMI shield. Other installations require a front bezel that has a locking latch and integrated EMI shield. Remove the bezel or shield to remove and install the drives.

DPE front view

On the front, the DPE contains the following elements:

- Drives in 2.5 in. carriers
- Status LEDs

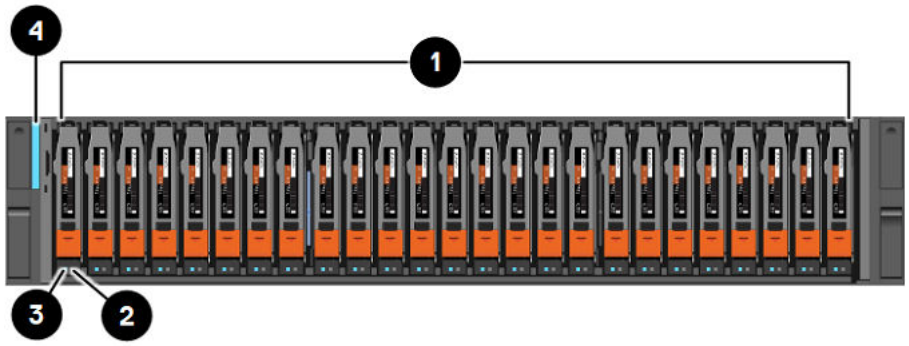

Figure 1. DPE front view

Table 1. DPE component locations

Location	Description
1	SAS or SAS Flash drives
2	Drive fault LED
3	Drive ready/activity LED
4	DPE turn on LED



Figure 2. DPE and drive LEDs

Table 2. DPE and drive LEDs

LED	Location	State	Description
Drive fault	1	Amber	Fault has occurred.
		Off	No fault has occurred, normal operation.
Drive active	2	Blue	Drive activity.
		Off	The drive is powered off.
DPE fault/power	3	Blue	Power is on. No fault has occurred, normal operation.
		Amber	Power is on. Fault has occurred within the enclosure.
		Off	The power is off.

System identification tags

The Product Serial Number Tag (PSNT) and World Wide Name Seed are serialized labels that allow customer support to track nested hardware material in the field.

Product Serial Number Tag

The PSNT for the 25-slot DPE is a black pull-out tag that is located between the drives in slots 16 and 17.

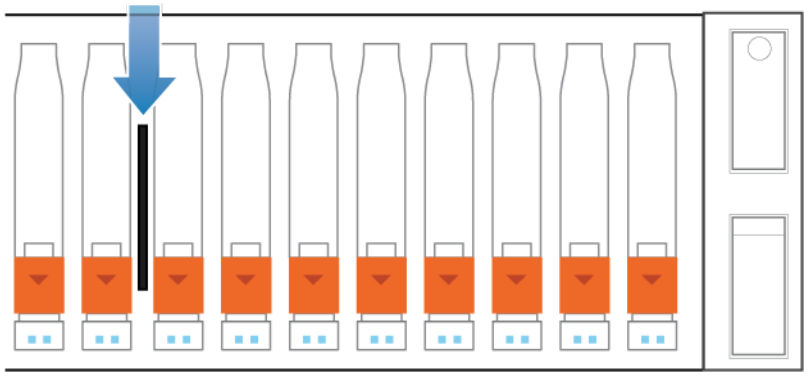

Figure 3. PSNT location

World Wide Name (WWN) Seed Tag

The World Wide Name (WWN) Seed tag is a blue pull-out tag that is located between the drives in slot 7 and 8.

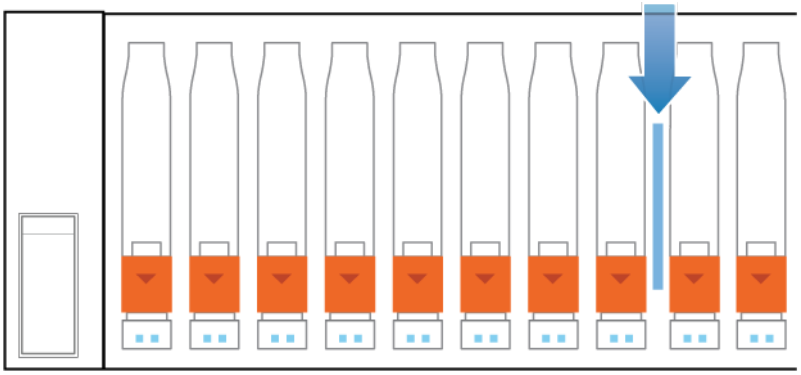

Figure 4. WWN Seed tag location

DPE rear view

On the rear of the DPE are two SP assemblies: SP assembly A and SP assembly B.

Each SP assembly contains the following hardware components:

- One embedded module
- Two optional I/O modules
- One power supply module

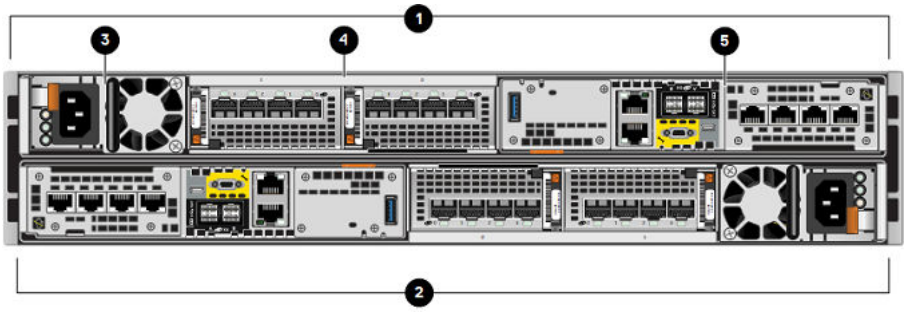

Figure 5. DPE rear view with hardware component locations

Table 3. DPE hardware component locations

Location	Description
1	Storage processor assembly B
2	Storage processor assembly A
3	Power supply module
4	I/O module, slots 0 and 1
5	Embedded module

DPE embedded modules and 4-port cards

About embedded modules

Each SP assembly contains one embedded module that can hold one 4-port card for connectivity.

NOTE: Both SP assemblies must have the same type of embedded modules in the same slots.

The embedded module contains the following components:

- One 4-port card
- One non-maskable interrupt (NMI) button
- Two mini-SAS HD back-end ports
- Two RJ-45 LAN connectors
  - System management port ( )
  - Service port ( )
- One USB 3.0 port
- One mini-USB port (unused)
- One DB9 serial port (service access)

NOTE: The following figure shows the location of these components on the embedded module in SP assembly A. The location of the components in SP assembly B is mirrored.

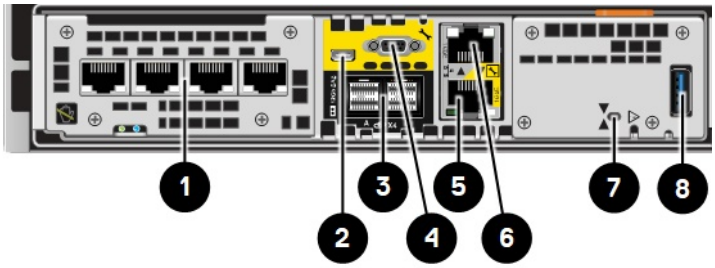

Figure 6. Embedded module rear view with component locations

Table 4. Embedded module component locations

Location	Description
1	4-port card
2	Mini serial port (unused)
3	Mini-SAS HD back-end ports
4	DB9 serial port (unused)
5	RJ-45 LAN connector - service port
6	RJ 45 LAN connector - system management port
7	Non-maskable interrupt (NMI) button
8	USB 3.0 port

About 4-port cards

The 4-port card is an optional component located within the embedded module that serves Ethernet traffic and iSCSI block protocol. There are two supported 4-port cards: the 25GbE 4-port card and the 10GbE BaseT 4-port card.

The 25GbE 4-port card supports 1GbE SFP to RJ45, 10GbE or 25GbE SFP28, 25GbE passive TwinAx, and 10GbE active or passive TwinAx. Depending on the installed SFP or TwinAx cable, the following speeds are supported: 1GbE, 10GbE, and 25GbE. The ports may be configured individually with TwinAx or any of the supported SFPs.

The 10GbE BaseT 4-port card supports speeds of 1GbE and 10 GbE.

Embedded module and 4-port card LED status

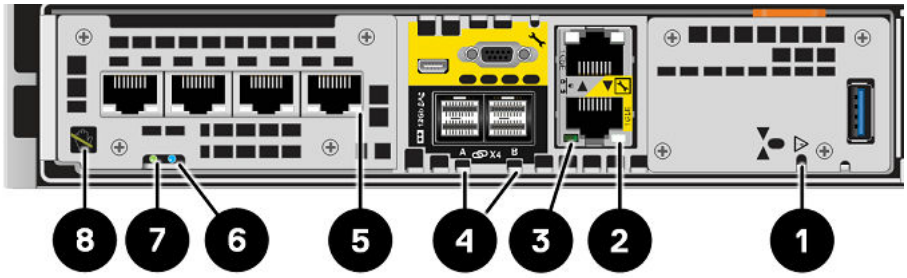

Figure 7. Embedded module LEDs

Table 5. Embedded module LEDs

LED	Location	State	Description
Embedded module fault	1	Amber	Embedded module has faulted.
		Off	No fault has occurred, normal operation.
Ethernet port link	2	Green	Link established.

Table 5. Embedded module LEDs (continued)

LED	Location	State	Description
		Off	No link established.
Ethernet port activity	3	Amber blinking	Port activity.
		Off	No port activity.
SAS port/activity Link	4	Blue	SAS port link is up.
		Off	No link established.
Port link	5	Green	Link up with high speed.
		Amber	Link up with degraded speed.
		Off	Link down.
Node fault	6	Amber	Fault has occurred.
		Blue	Node in Degraded Mode.
		Amber or blue blinking	The system is booting.
		Blue and amber alternating (green for 3 seconds)	System uninitialized. A management IP address has not been assigned.
		Blue and amber alternating at one second intervals	Node in Service Mode.
		Off	No fault has occurred, normal operation.
Storage processor assembly power	7	Green	Node is on (main power).
		Green blinking	Node is initializing a serial over LAN session.
		Off	Node is off.
Unsafe to remove	8	White	Do not remove the node. Improper removal could cause data loss.
		Off	Safe to remove the node or embedded module when the node or embedded module has been properly prepared.

Nonmaskable interrupt (NMI) button

The nonmaskable interrupt (NMI) button is a recessed button located on the embedded module, which is used to reset the system password or force a system reboot.

Use a non-metallic object such as a toothpick or pen to press the recessed button. Press the button for approximately 2 seconds to reset the password. The SP assembly fault LED blinks blue when the password has been successfully reset.

Press the button for 10 or more seconds to force a system reboot.

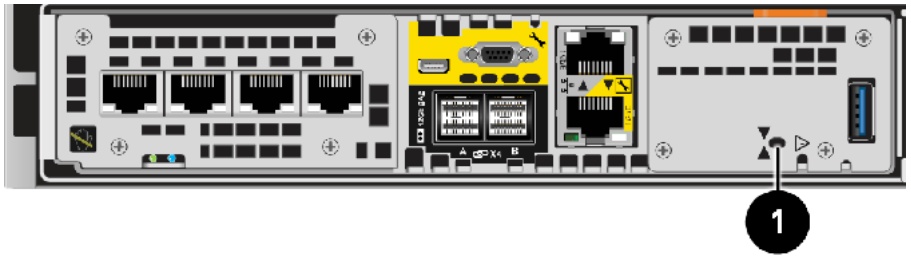

Figure 8. Location of the NMI button on the embedded module

DPE I/O module types

I/O module installation priority

There are two I/O module slots per SP assembly: slot 0 and slot 1. Slot 0 has a 16 lane PCIe channel, and slot 1 has an eight lane PCIe channel.

Populate new I/O modules in the following order to take advantage of the increased speed on slot 0. If two I/O modules are ordered, use the same installation priority for both I/O modules.

1. 4-port 32Gb Fibre Channel I/O module
2. 4-port 25GbE Optical I/O module
3. 4-port 16Gb Fibre Channel I/O module
4. 4-port 10GbE BaseT I/O module
5. 4-port 12Gb SAS backend I/O module

When adding new I/O modules, always install I/O modules in pairs: one module in SP assembly A and one module in SP assembly B. Both SP assemblies must have the same type of I/O modules in the same slots.

I/O module LED status

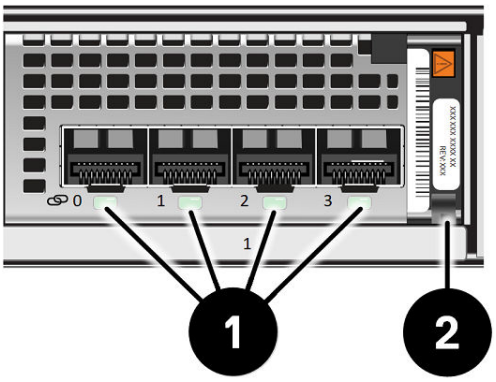

Figure 9. Base enclosure 4-port I/O module LEDs

Table 6. Base enclosure 4-port I/O module LEDs

LED	Location	State	Description
Port link	1	Green or blue	Link up
		Off	Link down
Power fault	2	Green	Power on
		Amber	Power fault

4-port 32Gb Fibre Channel I/O module

The 4-port 32Gb Fibre Channel I/O module is used to serve Fibre Channel block protocol over SAN to hosts for the platform. Each port employs an optical SFP+ connection that supports 16 Gb and 32 Gb SFPs. 16 Gb SFPs support speeds of 4 Gb/s, 8 Gb/s, and 16 Gb/s. 32 Gb SFPs support speeds of 8 Gb/s, 16 Gb/s, and 32 Gb/s.

4-port 25GbE Optical I/O module

The 4-port 25GbE Optical I/O module is an Ethernet I/O module that is used to serve Ethernet network traffic and iSCSI block protocol to hosts for the platform. The I/O module uses an optical 10 Gb or 25 Gb capable SFP+ connection to a host or switch port, and it supports speeds of 1 Gb/s, 10 Gb/s, and 25 Gb/s.

4-port 16Gb Fibre Channel I/O module

The 4-port 16Gb Fibre Channel I/O module comes with four optical ports, one power and fault LED, and a combination link and activity LED for each optical port. This I/O module can interface at speeds of 4 Gb/s, 8 Gb/s, and 16 Gb/s FC for host or initiator layered connections.

NOTE: For the 480/480F, 680/680F, and 880/880F systems. you can upgrade from a 4-port 16Gb Fibre Channel I/O module to a 4-port 32Gb Fibre Channel I/O module . For information on how to perform this procedure, refer to the Dell Unity 480/F, 680/F, and 880/F Field Replacement Guide.

4-port 10GbE BaseT I/O module

The 4-port 10GbE BaseT I/O module can interface at speeds of 1 Gb/s and 10 Gb/s and supports both IP(file) and iSCSI (Block) on the same SP assembly. Ports can be configured as both IP and iSCSI simultaneously. The I/O module comes with four 10-Gb/s RJ-45 ports, one power/fault LED, activity LED, and link LED for each port.

4-port 12Gb SAS backend I/O module

Where supported, the 4-port 12Gb SAS backend I/O module comes with four x4 lane mini-SAS high density (HD) ports, one power and fault LED, and a combination link and activity LED for each port. Install this I/O module into the SP assembly to provide additional SAS buses. Labeled 12 Gb SAS v1.

NOTE: The optional back-end 12-Gb/s SAS module is only supported on Unity 480F, Unity 680F, and Unity 880F systems.

The 4-port 12Gb SAS backend I/O module can also be configured to support x8 lane cabling for the 80-drive DAE by combining ports 0 and 1 as back-end 2, or ports 2 and 3 to create back-end 4. The I/O module can also be configured to support both x4 lane and x8 lane back-ends simultaneously.

NOTE: If the 4-port 12Gb SAS backend I/O module is to be configured for x8 lane cabling, the x8 lane cable must be inserted into the I/O module before persisting it. If the x8 lane cables are not inserted into the I/O module first, all four ports default to x4 lane ports.

DPE power supply

NOTE: The power supply used in your system must meet the system power requirements and must be the same type of power supply to be used in both nodes. Do not mix power supply types.

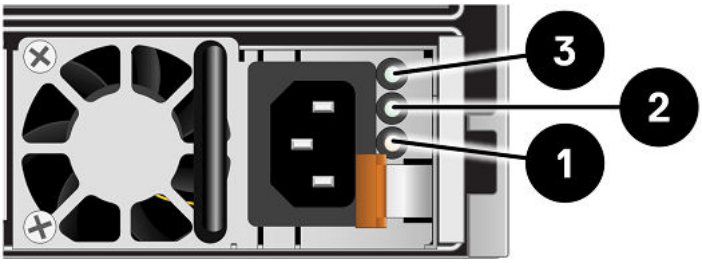

Figure 10. DPE power supply LEDs

Table 7. DPE AC power supply LEDs

LED	Location	State	Description
Fault	1	Solid amber	Power supply or backup fault. Check the cable connection.
		Off	There is no fault.
Supply output status	2	Green	Outputs are normal.
		Off	Outputs are faulted or disabled.

Table 7. DPE AC power supply LEDs (continued)

LED	Location	State	Description
AC power (input)	3	Green	AC power is on.
		Off	AC power is off. Verify the power source.

Storage processor assembly internal components

Included within the SP assembly are the following components:

- Dual inline memory modules (DIMM)
- M.2 SSDs
- Internal battery backup module
- Fan module

Dual inline memory modules

Twenty-four, 288-pin DIMM sockets support up to 12 DDR4 DIMMs, capable of up to 96 GB, 192 GB, or 384 GB of memory, depending on the model.

Internal battery backup module

The SP assembly includes a Lithium-ion (Li-ion) internal battery that powers the associated SP assembly during a power event.

M.2 SSD

Each SP assembly has two slots for M.2 SSD on a M.2 SSD adaptor located between DIMM slots 5/17 and 6/18. One M.2 SSD is used for general system operations, while the other M.2 SSD is used for vaulting.

Fan module

Six redundant fan modules connect to the motherboard within the SP assembly to provide continuous airflow through the front drives and through the rear of the SP assembly to keep the components at optimal operating temperatures.

NOTE: The SP assembly performs a protective thermal shutdown if two cooling modules fault within the same SP assembly.

2

Technical specifications

Topics:

- Technical specifications
- Dimensions and weight
- Power requirements
- Operating environment requirements

Technical specifications

Storage processor assembly specifications

Table 8. Specifications for each model

Parameter (per SP assembly)	Unity 480/480F	Unity 680/680F	Unity 880/880F
CPU	2 x dual-socket Intel CPUs, 32 cores per Array, 1.8GHz	2 x dual-socket Intel CPUs, 48 cores per Array, 2.1GHz	2 x dual-socket Intel CPUs 64 cores per Array, 2.1GHz
Memory	192 GB	384 GB	768 GB
Embedded SAS ports	4 x 4 lane 12Gb/s SAS ports for BE Connection	4 x 4 lane 12Gb/s SAS ports for BE Connection	4 x 4 lane 12Gb/s SAS ports for BE Connection
Optional SAS ports	Four, 4-lane or two, 8-lane 12 Gb/s SAS I/O module	Four, 4-lane or two, 8-lane 12 Gb/s SAS I/O module	Four, 4-lane or two, 8-lane 12 Gb/s SAS I/O module

DAE and drive specifications

Supported DAEs:

- 2U, 25-drive disk-array enclosure
- 3U, 15-drive disk-array enclosure
- 3U, 80-drive disk-array enclosure

Table 9. Drive and DAE support

Parameter	Unity 480/480F	Unity 680/680F	Unity 880/880F
Maximum drives	750	1000	1500
Minimum drives	6	6	6
Array enclosure	A 2U Disk Processor Enclosure (DPE) with twenty five 2.5" drives		
Drive Enclosure (DAE - Disk Array Enclosure)	All-Flash (F) models support 2.5" drives in 2U twenty five drive and 3U eighty drive trays. Hybrid models support 2.5" drives in 2U twenty five drive and 3U eighty drive trays; and 3.5" drives in 3U fifteen drive trays		

Drive counts listed in parentheses next to the maximum amount of DAEs represent the maximum achievable drive count when using the maximum of each DAE, plus the 25 drives on the DPE.

Embedded module specifications

Supported optional 4-port cards:

- 10GbE BaseT 4-port card
- 25GbE 4-port card

The 4-port card can also be left unpopulated.

I/O module specifications

Supported I/O modules:

- 4-port 16Gb Fibre Channel I/O module
- 4-port 25GbE Optical I/O module
- 4-port 10GbE BaseT I/O module
- 4-port 12Gb SAS backend I/O module

Power supply unit specifications

You can use high line power, such as in a rack, or low line power, such as from a wall power outlet, to supply power to the DPE. A step-up transformer, not included, is required for low line power with Unity 880/880F systems.

Table 10. Power specifications per Unity model

Model	High line	Low line
Unity 480/480F	1800 W	1450 W
Unity 680/680F	1800 W	1450 W
Unity 880/880F	1800 W	1800 W (Step-up transformer required)

Dimensions and weight

Table 11. 2U, 25-drive DPE, dimensions and weight

Dimension	Value
Weight (unpopulated)	25.9 kg (54.11 lbs)
Vertical size	2 NEMA units
Height	8.72 cm (3.43 in.)
Width	44.72 cm (17.61 in.)
Depth	79.55 cm (31.32 in.)

NOTE: The weight does not include mounting rails. Allow approximately 2.3-4.5 kg (5-10 lb) for a rail set.

Power requirements

Power consumption values are based on enclosures with all power supplies, drives, embedded modules and I/O modules populated.

To estimate power consumption values for your specific environment, go to the Dell Power Calculator.

Table 12. DPE power requirements, per model

Specification	Unity 480/480F	Unity 680/680F	Unity 880/880F
AC line voltage	100 VAC–240 VAC ± 10%, single phase, 47 Hz–63 Hz	100 VAC–240 VAC ± 10%, single phase, 47 Hz–63 Hz	100 VAC–240 VAC ± 10%, single phase, 47 Hz–63 Hz
AC line current (operating maximum)	10.6 A max at 100 VAC; 5.3 A max at 200 VAC	11.72 A max at 100 VAC; 5.86 A max at 200 VAC	14.41 A max at 100 VAC; 7.2 A max at 200 VAC
Power consumption (operating maximum)	1060 VA (1050 W) max at 100 VAC; 1060 VA (1050 W) max at 200 VAC	1172 VA (1161 W) max at 100 VAC; 1172 VA (1161 W) max at 200 VAC	1440.77 VA (1411.96) max at 100 VAC; 1440.77 VA (1411.96 W) max at 200 VAC
Power factor	0.95 minimum at full load, @ 100/ 200 VAC	0.95 minimum at full load, @ 100/ 200 VAC	0.95 minimum at full load, @ 100/ 200 VAC
Heat dissipation (operating maximum)	3.78 x 10^6 J/hr, (3,581 Btu/hr) max at 100 VAC; 3.78 x 10^6 J/hr, (3,581 Btu/hr) max 200 VAC	4.18 x 10^6 J/hr, (3,960 Btu/hr) max at 100 VAC; 4.18 x 10^6 J/hr, (3,960 Btu/hr) max 200 VAC	5.08 x 10^6 J/hr, (4,818 Btu/hr) max at 100 VAC; 5.08 x 10^6 J/hr, (4,818 Btu/hr) max 200 VAC
In-rush current	45 Apk cold per line cord, at any line voltage	45 Apk cold per line cord, at any line voltage	45 Apk cold per line cord, at any line voltage
Startup surge current	120 Apk hot per line cord, at any line voltage	120 Apk hot per line cord, at any line voltage	120 Apk hot per line cord, at any line voltage
AC protection	20 A fuse on each power supply, single line	20 A fuse on each power supply, single line	20 A fuse on each power supply, single line
AC inlet type (high line power)	IEC320-C14 appliance coupler, per power zone	IEC320-C14 appliance coupler, per power zone	IEC320-C14 appliance coupler, per power zone
AC inlet type (low line power)	IEC320-C20 appliance coupler, per power zone	IEC320-C20 appliance coupler, per power zone	IEC320-C14 appliance coupler, per power zone
Ride-through sharing	10 ms min	10 ms min	10 ms min
Current sharing	± 5 percent of full load, between power supplies	± 5 percent of full load, between power supplies	± 5 percent of full load, between power supplies

Operating environment requirements

Temperature gradient and altitude requirements

Systems and components must not experience changes in temperature and humidity that are likely to cause condensation to form on or in that system or component. Do not exceed the temperature gradient of 20°C/hr (36°F/hr), or the altitude requirement of 3050 m (10,0000 ft).

Recommended range of operation

The recommended range of operation is the limit under which equipment operates the most reliably while still achieving reasonably energy-efficient data center operation.

The recommended range of operation is 18°C–27°C (64.4°F to 80.6°F) at 5.5°C (41.9°F) dew point to 60% relative humidity and 15°C (59°F) dew point.

Continuous allowable range of operation

Data center economization techniques such as free cooling can be employed to improve overall data center efficiency. These techniques can cause equipment inlet conditions to fall outside the recommended range, but still within the continuously allowable range. Equipment can be operated without any hourly limitations in this range.

The continuous allowable range of operation is 10°C–35°C (50°F–95°F) at 20% to 80% relative humidity with 21°C (69.8°F) maximum dew point (maximum wet bulb temperature). De-rate the maximum allowable dry bulb temperature by 1°C per 300 m above 950 m (1°F per 547 ft above 3117 ft).

Expanded allowable range of operation

During certain times of the day or year, equipment inlet conditions can fall outside the continuously allowable range but still within the expanded improbable range. Equipment operation is limited to ≤ 10% of annual operating hours in this range.

The expanded allowable range of operation is 5°C–10°C and 35°C–40°C (with no direct sunlight on the equipment) at -12°C dew point and 8% to 85% relative humidity with 24°C dew point (maximum wet bulb temperature). Outside the continuously allowable range (10°C–35°C), the system can operate down to 5°C or up to 40°C for a maximum of 10% of its annual operating hours. For temperatures 35 °C–40°C (95°F–104°F), de-rate the maximum allowable dry bulb temperature by 1°C per 175 m above 950 m (1°F per 319 ft above 3117 ft).

Exceptions to the expanded allowable range of operation

During certain times of the day or year, equipment inlet conditions can fall outside the continuously allowable range but still within the expanded exceptional range. Equipment operation is limited to ≤ 1% of annual operating hours in this range.

Exceptions to the expanded allowable range of operation are 5°C–10°C and 35°C–40°C (with no direct sunlight on the equipment) at -12°C dew point and 8% to 85% relative humidity with 24°C dew point (maximum wet bulb temperature). Outside the continuously allowable range (10°C–35°C), the system can operate down to 5°C or up to 45°C for a maximum of 1% of its annual operating hours. For temperatures between 35°C and 45°C (95°F–104°F), de-rate the maximum allowable dry bulb temperature by 1°C per 125 m above 950 m (1°F per 228 ft above 3117 ft).

DPE airflow

The DPE uses an adaptive cooling algorithm that increases or decreases fan speed as the unit senses changes to the external ambient temperature. Exhaust increases with ambient temperature and fan speed, and is roughly linear within recommended operating parameters. Note that the information in the table below is typical, and was measured without cabinet front/rear doors that would potentially reduce front-to-back air flow.

Table 13. DPE airflow

Max Airflow CFM	Min Airflow CFM	Max Power Usage (Watts)
106 CFM	40 CFM	850 W

Environmental recovery

If the system exceeds the maximum ambient temperature by approximately 10°C (18°F), the SP assemblies in the system begin an orderly shutdown that saves cached data, and then shut themselves down. Link control cards (LCCs) in each DAE in the system power down drives but remain powered on.

If the system detects that the temperature has dropped to an acceptable level, it restores power to the DPEs and the LCCs restore power to their drives.

Shipping and storage requirements

CAUTION: Systems and components must not experience changes in temperature and humidity that are likely to cause condensation to form on or in that system or component. Do not exceed the shipping and storage temperature gradient of 45°F per hr (25°C per hr).

Table 14. Shipping and storage requirements

Requirement	Description
Ambient temperature	-40° F to 149°F (-40°C to 65°C)

Table 14. Shipping and storage requirements (continued)

Requirement	Description
Temperature gradient	45°F per hr (25°C per hr)
Relative humidity	10% to 90% noncondensing
Elevation	-50 ft to 35,000 ft (-16 m to 10,600 m)
Unpowered storage time	Do not exceed six consecutive months of unpowered storage.

Shock and vibration

Products have been tested to withstand the shock and random vibration levels.

The levels apply to all three axes and should be measured with an accelerometer on the equipment enclosures within the cabinet and shall not exceed any of the values in this table.

Table 15. Platform Response Levels

Platform condition	Response measurement level
Nonoperational shock	25 Gs for 3-milliseconds
Operational shock	6 Gs for 11-milliseconds
Nonoperational random vibration	0.40 Grms at 5-500 Hz for 30 minutes
Operational random vibration	0.21 Grms at a frequency range between 5-500 Hz for 10 minutes

Systems that are mounted on an approved package have completed transportation testing to withstand shock and vibrations in the vertical direction only. The levels shall not exceed the values in this table.

Table 16. Packaged System Measurement Levels

Packaged system condition	Response measurement level
Transportation shock	10 Gs for 12-milliseconds
Transportation random vibration	0.28 Grms at a frequency range between 1-100 Hz for 4 hours

Fire suppressant disclaimer

Fire prevention equipment in the computer room should always be installed as an added safety measure. A fire suppression system is the responsibility of the customer. When selecting appropriate fire suppression equipment and agents for the data center, choose carefully. An insurance underwriter, local fire marshal, and local building inspector are all parties that you should consult during the selection of a fire suppression system that provides the correct level of coverage and protection.

Equipment is designed and manufactured to internal and external standards that require certain environments for reliable operation. We do not make compatibility claims of any kind nor do we provide recommendations on fire suppression systems. It is not recommended to position storage equipment directly in the path of high pressure gas discharge streams or loud fire sirens so as to minimize the forces and vibration adverse to system integrity.

NOTE: The previous information is provided on an “as is” basis and provides no representations, warranties, guarantees or obligations on the part of our company. This information does not modify the scope of any warranty set forth in the terms and conditions of the basic purchasing agreement between the customer and the manufacturer.

Air quality requirements

The products are designed to be consistent with the requirements of the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) Environmental Standard Handbook and the most current revision of Thermal Guidelines for Data Processing Environments, Second Edition, ASHRAE 2009b.

Cabinets are best suited for Class 1 datacom environments, which consist of tightly controlled environmental parameters, including temperature, dew point, relative humidity and air quality. These facilities house mission-critical equipment and are typically fault-tolerant, including the air conditioners.

The data center should maintain a cleanliness level as identified in ISO 14664-1, class 8 for particulate dust and pollution control. The air entering the data center should be filtered with a MERV 11 filter or better. The air within the data center should be continuously filtered with a MERV 8 or better filtration system. In addition, efforts should be maintained to prevent conductive particles, such as zinc whiskers, from entering the facility.

The allowable relative humidity level is 20 to 80% non condensing, however, the recommended operating environment range is 40 to 55%. For data centers with gaseous contamination, such as high sulfur content, lower temperatures and humidity are recommended to minimize the risk of hardware corrosion and degradation. In general, the humidity fluctuations within the data center should be minimized. It is also recommended that the data center be positively pressured and have air curtains on entry ways to prevent outside air contaminants and humidity from entering the facility.

For facilities below 40% relative humidity, it is recommended to use grounding straps when contacting the equipment to avoid the risk of Electrostatic discharge (ESD), which can harm electronic equipment.

As part of an ongoing monitoring process for the corrosiveness of the environment, it is recommended to place copper and silver coupons (per ISA 71.04-1985, Section 6.1 Reactivity), in airstreams representative of those in the data center. The monthly reactivity rate of the coupons should be less than 300 Angstroms. When monitored reactivity rate is exceeded, the coupon should be analyzed for material species and a corrective mitigation process put in place.

Storage time (unpowered) recommendation: do not exceed 6 consecutive months of unpowered storage.