Site Requirements Guide

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Site Preparation 1

About this chapter

This chapter describes the tools you need and the system connection, circuit breaker, and outlet requirements for your site.

Topics in this chapter

This chapter discusses the following topics:

Required tools and equipment

Required tools and equipment

Prior to receiving your hardware, make sure that you have the appropriate tools and equipment assembled and ready to use:

- Pallet jack, forklift, or hand truck, depending on what you receive
- #1 and #2 Phillips head screwdrivers and a flathead screwdriver for cable adapters
- ASCII terminal (also referred to as an ANSI terminal) or Serial console
- Null modem cable (optional)

Attention

If the DB-9 to DB-9 straight-through serial cable for an ASCII terminal connection provided with your system is not compatible with your terminal connector, you need a null modem cable.

WARNING

Three people are required to install FAS20xx series systems, FAS900 series systems, GF900 series gateways, FAS6000 series systems, DS4243 and DS4246 disk shelves, and NearStore/VTL storage engines when both power supplies are installed. Two people are required to install all other storage systems and disk shelves safely into a rack or System Cabinet.

Additional tools necessary for DC power connections

If you ordered a DC power version of your controller, you need the following items to fabricate the three-way cables required for DC power connections:

- Wire-stripper
- Soldering tool and pliers (earlier version of the DC power supply)
- 12 AWG to 6 AWG x 3 copper wire (length determined by environment)
- 3/16" flathead screwdriver

For details about your DC power supply, see the DC power supply documentation that came with your DC power supply. You can also find this documentation on the NetApp Support Site at support.netapp.com.

Attention

Do not mix different AC with DC power supplies in your controller.

System connectivity requirements

Types of connectivity

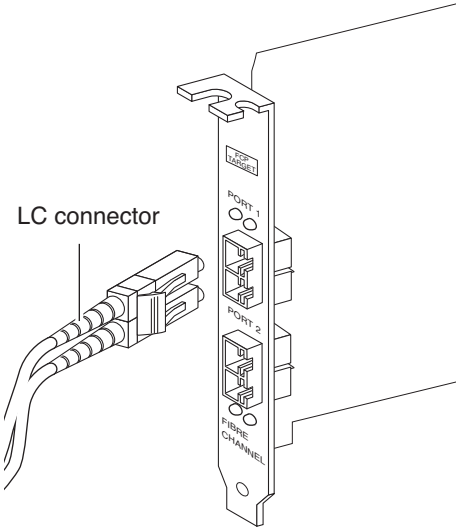
Your system requires the following types of connections:

- Fibre Channel—Connects your controller to disk shelves, Fibre Channel switches, ATTO FibreBridge 6500N, tape backup devices, and to other storage devices. They can connect through the following media:
  - Copper
  - Fiber
- SAS—Connects your appliance to SAS disk shelves and other SAS-based equipment. They can connect through the following media:
  - Copper mini-SAS cable
  - Copper cable with QSFP connectors
  - Fibre optical SAS cable

    The *SAS Storage Cabling and Infrastructure FAQ* at www.netapp.com/us/media/sas-storage-cabling-and-infrastructure.pdf contains information abou fibre optical SAS cables.
- Ethernet—Connects your controller to an Ethernet network through the following media:
  - Copper
  - Fiber

Fibre Channel connectivity

Your controller connects to disk shelves, Fibre Channel switches, ATTO FibreBridge 6500N, tape backup devices, and other storage through onboard ports or adapter ports. The following illustration shows a typical LC connector used to connect Fibre Channel devices:

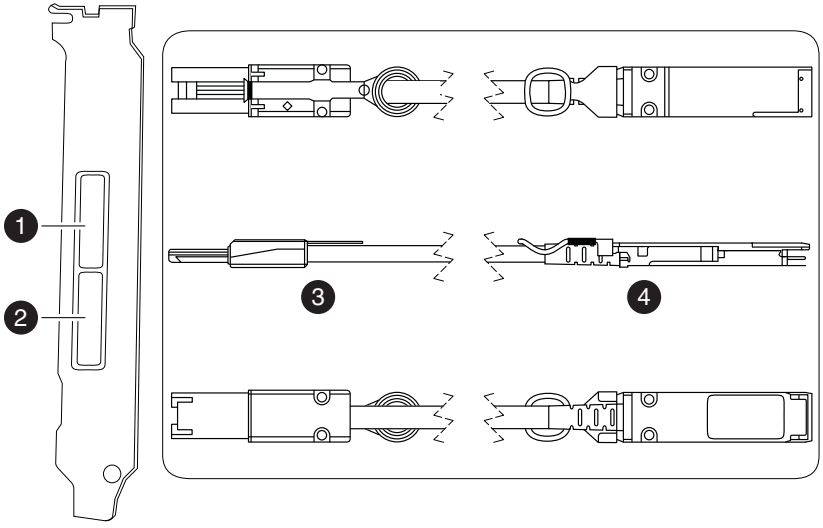


The following table lists maximum distances supported by 50 micron multimode fiber optic cables, with LC or SC connectors, connected to dual-port or quad-port Fibre Channel NICs, or ATTO FibreBridge 6500N:

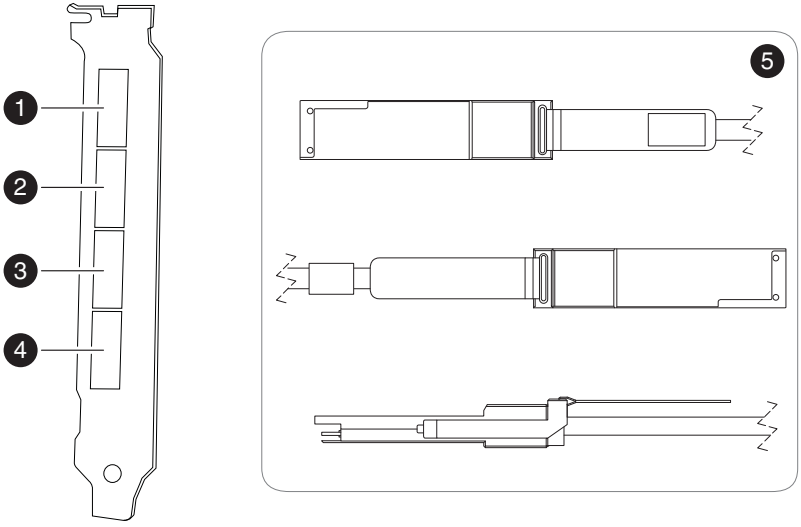
Wavelength (Nanometers)	**Core size (microns)**	**Modal Bandwidth (MHz/km)**	**Distance (Meters)**	**Card (speed)**
850	50	500	500	1 Gb
			300	2 Gb
			150	4 Gb
			50	8 Gb
		2000	860	1 Gb
			500	2 Gb
			270	4 Gb
			150	8 Gb

SAS connectivity

Your controller connects to SAS disk shelves and other SAS-based devices through SAS host bus adapters (HBAs) or onboard ports. The following illustrations show the dual-port SAS HBA with mini-SAS cables, and the quad-port SAS HBA with copper cables with QSPFP connector:



1	Port A
2	Port B
3	QSFP-to-Mini-SAS copper cable—Mini-SAS connector (to X2062A card)
4	QSFP-to-Mini-SAS copper cable—QSFP connector (to disk shelf)



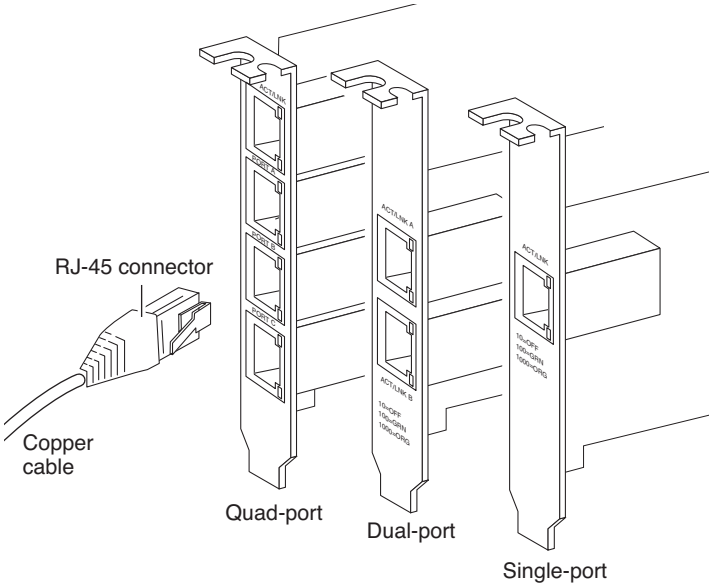
1	Port A
2	Port B
3	Port C
4	Port D
5	SAS QSFP-to-QSFP copper cable

Ethernet connectivity

Your controller connects to a GbE network through either onboard ports or GbE network interface cards (NICs) which support either copper or fiber cabling.

Copper GbE cabling and NICs: The cabling and network requirements are for GbE and 10GbE networks using copper cabling.

10Base-T/100Base-TX/1000Base-TX NICs



Types: Single-port, dual-port, quad-port

Connector type: RJ-45 for all

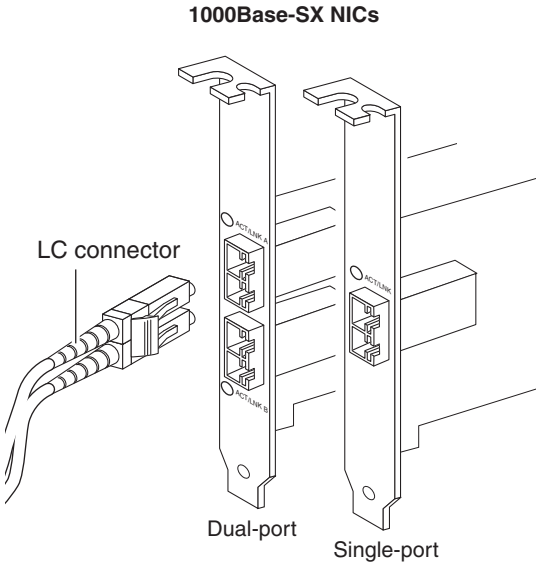
Cable type: Category 5, Category 5E or Category 6 unshielded four-pair cable for 10/100-T/100BASE-TX/1000BASE-TX

Note

Category 5 cables that do not have four-pair wires do not work properly with 10/100-T/100BASE-TX/1000BASE-TX speed networks. Use Category 6 cables for these networks.

Maximum distance: 100m

Fiber GbE cabling and NICs: The following cabling and network requirements are for GbE networks using optical cabling.



The following table lists maximum distances supported by 50 or 62.5 micron multimode fiber optic cables, with LC or LC duplex connectors for the 1000BASE-SX NICs and 10GbE NICs, connected to single-port or dual-port Fibre Channel GbE NICs:

Wavelength (Nanometers) MM laser	Core size (microns)	Modal Bandwidth (MHz/km)	Distance (Meters)	Card type
850	50	500	550	1000BASE-SX
	62.5	160	220	
	62.5	200	275	
	62.5	200	33	10GbE
	50	2,000	300	
	50	4,700	550	

Using older cables with PCI-X and PCIe 10GBASE-SR cards

Do not use less than the recommended 2,000 Mhz/km bandwidth for 10GBASE-SR cards. The following table lists maximum distances supported by some more common cable bandwidths:

Wavelength (Nanometers)	Core size (microns)	Modal Bandwidth (MHz/km)	Distance (Meters)
850	50	2,000	300
		500	82
		400	66
	62.5	200	33
		160	26

Circuit breaker, power outlet balancing, system cabinet power cord plugs, and console pinout requirements

About the requirements

NEMA: If your equipment is mounted in a rack, the total number of circuit breakers required for your equipment is based on the current draw. You should not load a circuit beyond 80 percent of the rated limit for the circuit.

For example, if you have a 20A circuit, you should load it to no more than 16A of draw.

IEC: If your equipment is mounted in a rack, the total number of circuit breakers required for your equipment is based on the current draw.

For example, if you have a 16A circuit, you should load it to no more than 16A of draw.

Attention

Overloading circuit breakers can lead to tripped breakers or power brownouts that can cause system errors.

Balancing the load across PDUs

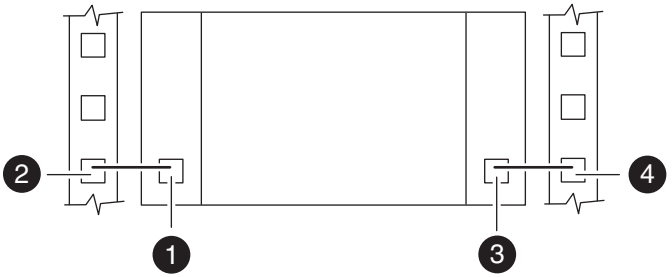
A best practice is to plan how to distribute the total load across the PDU banks prior to plugging your system components into them. You should make each bank load as equal as possible.

Keep the following considerations in mind when planning to balance the load:

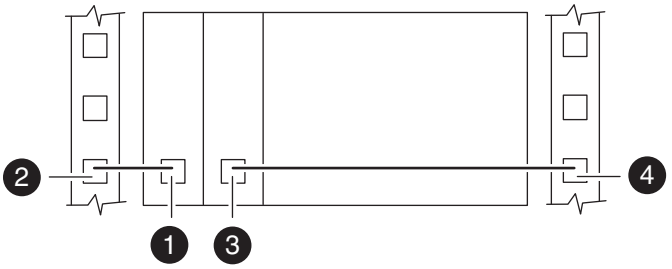
- Balancing the load depends on the number of components being connected and the location of the component power supply units (PSUs), as shown in the following illustrations.
- You should connect the components to different PDUs on opposite sides of the system cabinet, using the illustrations for reference.
- You should plug each component into the PDU outlet directly across from the component, using the illustrations for reference.

Examples of balancing the load with a single component: The following illustrations show three examples of connecting the PSUs of a single component, such as a controller in a single chassis, to the system cabinet PDUs.

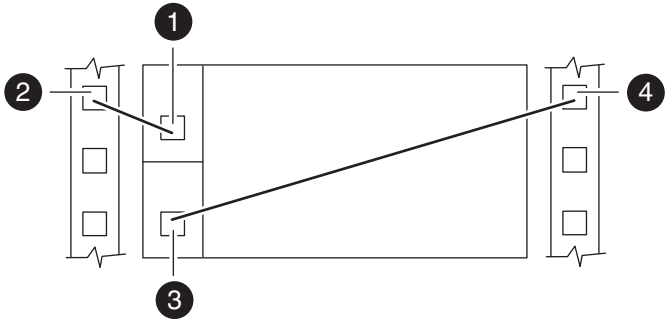
PSUs on opposite sides of the component:



PSUs on the same side of the component:



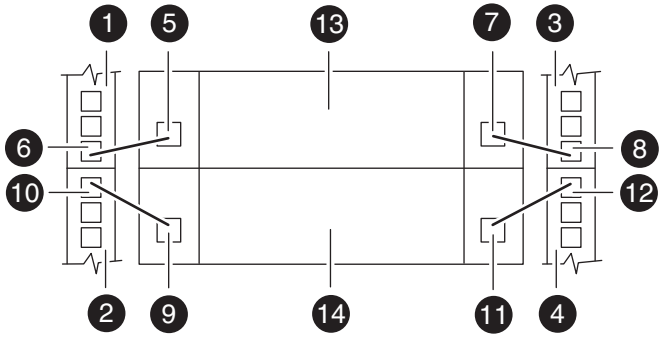
PSUs stacked on the same side of the component:



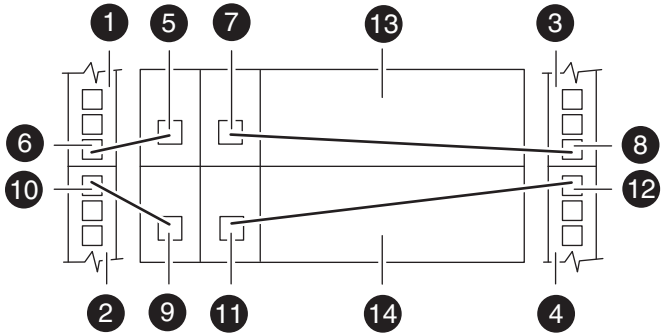
1	PSU 1
2	Left PDU outlet
3	PSU 2
4	Right PDU outlet

Examples of balancing the load with two components: The following illustrations show three examples of connecting the PSUs of two components, such as a component with two controller modules in a single chassis or two components close together, to the system cabinet PDUs.

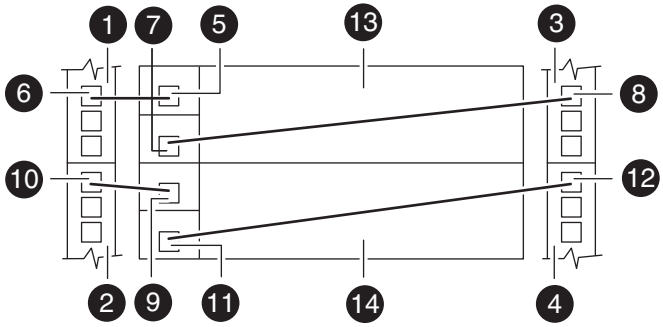
PSUs on opposite sides of the component:



PSUs on the same side of the component:



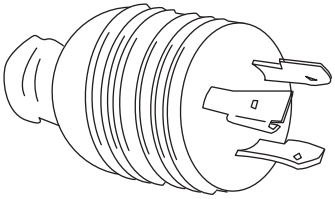
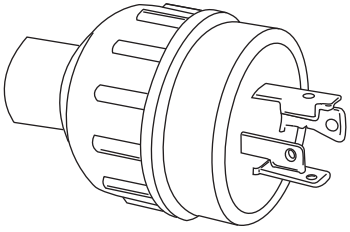
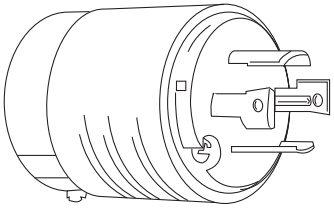
PSUs stacked on the same side of the component:

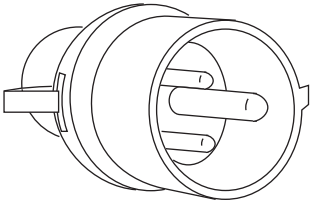
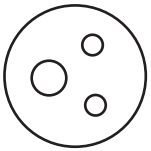
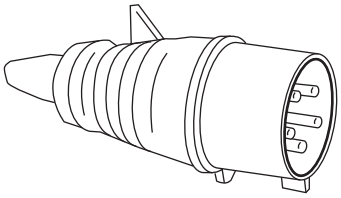
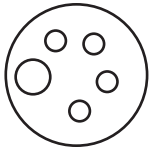
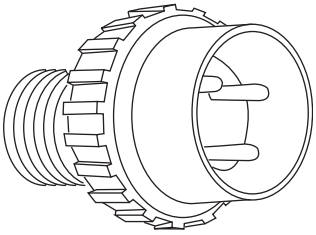
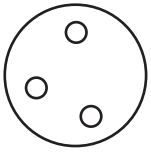


1	Left PDU, bank A
2	Left PDU, bank B
3	Right PDU, bank A
4	Right PDU, bank B
5	PSU 1, component 1
6	Left PDU, bank A outlet
7	PSU 2, component 1
8	Right PDU, bank A outlet
9	PSU 1, component 2
10	Left PDU, bank B outlet
11	PSU 2, component 2
12	Right PDU, bank B outlet
13	Component 1
14	Component 2

System cabinet power cord plugs

The following table lists system cabinet power cord plugs:

Region	Power cord	Plug	Socket view
U.S.A. Canada	NEMA L6-30 North America NEMA L6-20 North America	 **Note** NEMA L6-20 is slightly smaller in dimension than the NEMA L6-30.	
	NEMA L15-30 North America		
	NEMA L21-30 North America		

Region	Power cord	Plug	Socket view
Europe Asia Central America South America	IEC 60309, 32A, blue, P+N+E International IEC 60309, 16A, blue, P+N+E International	 **Note** The 16A plug is slightly smaller than the 32A plug.	
	IEC 60309, 32A, red, 3P+N+E		
Australia New Zealand	AS/NZS3123-20 Australia		

System cabinet PDU power cord length

The length of a system cabinet PDU power cord depends on the PDU type:

- 30A PDU power cords are 10 feet (3.05m)
- 20A PDU power cords are 15 feet (4.57m)

Console port adapter pinout

The following table lists the pinout configuration for the RJ-45 to DB-9 adapter shipped with the systems:

RJ-45	Signal	DB-9 (Male connector)
1 [not connected]		
2 [not connected]		
3 (connected to pin 3 on DB-9)	TXD	3 (connected to pin 3 on RJ-45)
4 (connected to pin 5 on DB-9)	GND	5 (connected to pin 4 on RJ-45)
5 [not connected]		
6 (connected to pin 2 on DB-9)	RXD	2 (connected to pin 6 on RJ-45)
7 [not connected]		[not connected] 1
8 [not connected]		[not connected] 4
		[not connected] 6 through 9

ASCII terminal console wiring

The following table lists the RJ-45 connection pinout for the ASCII terminal console wiring:

Pin number	Signal
1	Connected to pin 8
2	Not connected
3	TXD (from system)
4	GND
5	GND
6	RXD (to system)
7	Not connected
8	Connected to Pin 1

Hardware Characteristics 2

About this chapter

This chapter tabulates hardware characteristics for the following types of hardware:

Storage systems

About this section

This section lists tabulated descriptions of the hardware characteristics, clearance, environmental, and electrical requirements for different systems.

Note

Data for the FAS and V-series platforms are identified by the platform ID without using the FAS or V-series platform prefix. The prefixes are used only when the data is unique to that platform type.

How the measurements are made

These published system measurements are conservative. The following assumptions, conditions, and observations apply to these measurements:

- Line voltage is either 100V AC, 200V AC, or -48V DC.
- Current and power are steady state rms values.
- Heat dissipation in BTU/hour is based on Watts multiplied by 3.4129
- Measurements are taken at room ambient.
- Data is collected for each individual controller, controller module, or disk shelf, not for clustered systems or other combinations. Except for platforms that have two controllers in one chassis.
- Each disk shelf is fully populated with a particular drive type and speed and exercised with multiple threads of a disk stress test program.
- Controllers or controller modules with PCI slots are fully populated and are exercised with test program.
- To account for customer work loads that exceed these conditions, the total system workload is calculated using random read disk_qual to obtain electrical current, power, and heat dissipation values.
- If the system configuration causes fan speed to increase or decrease, the data is collected in that mode.
- Because fan speed can vary for a given set of conditions, the worst case set of numbers is presented.
- Electrical requirements for systems containing performance accelerator, Flash Cache, and Flash Cache 2 modules are measured with the maximum number of these modules installed in the system.

Interpreting the electrical requirements tables

The headings for the electrical requirements tables are defined as follows:

- Worst-case—Power consumption with system running on one PSU, high fan speed, and power distributed over one power cord. DS4xxx disk shelves are an exception, in that they require two PSUs.
- Per PSU—Typical power needs, per PSU, for a system operating under normal conditions.
- System—Typical total power needs for two PSUs in a system operating under normal condition and power distributed over two power cords, or four power cords for DS4243 disk shelves.

Converting watts to volt-amps (VA)

Use the following formula to calculate VA from watts:

VA = *Watts*/PF

PF = 0.95

Watts = Watts listed in the individual tables

Important information about ambient temperature

NetApp systems have variable speed cooling fans. At higher ambient temperatures, the fans will spin faster and consume more power. This may counteract some energy savings anticipated by raising the ambient temperature.

You should operate your system within the NetApp-defined ambient temperature range of 10-40° C. As the temperature increases, the reliability and life expectancy of electronics and hard disk drives decreases.

Important information about your environment

When selecting a location to set up your system, you must ensure that it meets the following general environmental requirements:

- The site is free of dust and dirt.
- There is sufficient room around your system for access to the components and for proper airflow around the system.
- The site meets temperature and humidity requirements for the system.
- The site meets the electrical requirements for your equipment.

For detailed information

For details about specific models of systems, see the following topics:

FAS250 characteristics

The following table lists the characteristics and requirements for your hardware.

Physical characteristics:

Weight	With disk drives	77 lbs (35 kg)
	Empty	50.6 lbs (23 kg)
Rack units		3
Height	Rack-mount	5.25 in. (13.3 cm)
	Tower	20.3 in. (51.6 cm)
Width	Rack-mount	17.6 in. (44.7 cm)
	Tower	10.4 in. (26.4 cm)
Depth	Rack-mount	20 in. (50.8 cm)
	Tower	20 in. (50.8 cm)

Clearance dimensions:

Front—cooling	All versions	6 in. (15.3 cm)
Rear—cooling	Tower	12 in. (30.5 cm)
	Two-post rack	19 in. (48.3 cm)
	Four-post rack	12 in. (30.5 cm)
Front—maintenance	Tower	25 in. (63.5 cm)
	Two-post rack	25 in. (63.5 cm)
	Four-post rack	25 in. (63.5 cm)
Rear—maintenance	Tower	12 in. (30.5 cm)
	Two-post rack	12 in. (30.5 cm)
	Four-post rack	12 in. (30.5 cm)

Environmental requirements:

Operating temperature range	41° F to 104° F (5° C to 40° C)
Non-operating temperature range	-40° F to 140° F (-40° C to 60° C)
Relative humidity	20 to 80% noncondensing
Acoustic level—Normal operating conditions at 23° C at sea level	58 dBA (LpA) Sound power measurement not available
Input power frequency, Hz (AC)	50 to 60
Input power voltage, V RMS (AC) (auto-ranging)	100-120V or 200-240V

Electrical requirements:

Input voltage		**100 to 120V**			**200 to 240V**		
	Drives	**Worst-case, single PSU**	**Typical**		**Worst-case, single PSU**	**Typical**	
			Per PSU	**System, two PSUs**		**Per PSU**	**System, two PSUs**
Input current measured, A	10K	2.84	1.74	1.71	1.36	0.86	1.71
	15K	3.27	2.0	3.99	1.65	1.01	2.01
Input power measured, W	10K	283	172.5	345	270	165	330
	15K	326	198.5	397	326	196	392
Thermal dissipation, BTU/hr	10K	964	589	1,178	919	562.5	1,125
	15K	1,110	677	1,354	1,110	667.5	1,335

FAS270 and GF270c characteristics

The following table lists the characteristics and requirements for your hardware.

Physical characteristic:

Weight	With disk drives	77 lbs (35 kg)
	Empty	50.6 lbs (23 kg)
Rack units		3
Height		5.25 in. (13.3 cm)
Width		17.6 in. (44.8 cm)
Depth		20 in. (50.9 cm)

Clearance dimensions

Front—cooling	All versions—two-post rack and four-post rack	6 in. (15.3 cm)
Rear—cooling		12 in. (30.5cm)
Front—maintenance		25 in. (63.5 cm)
Rear—maintenance		12 in. (30.5 cm)

Environmental requirements:

Operating temperature range	41° F to 104° F (5° C to 40° C)
Non-operating temperature range	-40° F to 149° F (-40° C to 60° C)
Relative humidity	20 to 80% noncondensing
Acoustic level—Normal operating conditions at 23° C at sea level	58 dBA (LpA) Sound power measurement not available
Input power frequency, Hz (AC)	50 to 60

Input power voltage, V RMS (AC) (auto-ranging	100-120V or 200-240V

FAS270 electrical requirements:

Input voltage		**100 to 120V**			**200 to 240V**		
	Drives	**Worst-case, single PSU**	**Typical**		**Worst-case, single PSU**	**Typical**	
			Per PSU	**System, two PSUs**		**Per PSU**	**System, two PSUs**
Input current measured, A	10K	3.12	1.88	3.76	1.52	0.92	1.83
	15K	3.83	2.15	4.30	1.83	1.04	2.07
Input power measured, W	10K	311	187.5	375	299	177.5	355
	15K	382	214.5	429	361	202.5	405
Thermal dissipation, BTU/hr	10K	1,062	639.5	1,279	1,020	606	1,212
	15K	1,302	731.5	1,463	1,230	690	1,380

GF270 electrical requirements:

Input voltage	**100 to 120V**			**200 to 240V**		
	Worst-case, single PSU	**Typical**		**Worst-case, single PSU**	**Typical**	
		Per PSU	**System, two PSUs**		**Per PSU**	**System, two PSUs**
Input power measured, W	218	123	246	210	119	238
Thermal dissipation, BTU/hr	743	420	840	716	405	810

2020 system characteristics

The following table lists the characteristics and requirements for your hardware.

Physical characteristics:

Weight—two controller modules and power supplies	Full (chassis with all disk drives) Empty (no internal disks)	66 lbs (29.9kg) 57 lbs (25.9kg)
Rack units		2
Height		3.5 in. (8.9 cm)
Width		17.6 in. (44.7 cm)
Depth		22.5 in. (57.2 cm)

Clearance dimensions:

Front—cooling	All versions—Two-post rack and four-post rack	6 in. (15.2 cm)
Rear—cooling		12 in. (30.5 cm)
Front of chassis—maintenance		30 in. (76.2 cm)
Rear of chassis—maintenance		36 in. (91.4 cm)

Environmental requirements:

Operating temperature range	50° F to 104° F (10° C to 40° C)
Non-operating temperature range	-40° F to 140° F (-40° C to 60° C)
Relative humidity	20 to 80% noncondensing
Acoustic level—Normal operating conditions at 23° C at sea level	≤ 60 dBA sound pressure (LpA) Sound power measurement not available

Altitude	10,000 ft. operating 40,000 ft. nonoperating
Input power frequency, Hz (AC)	50 to 60
Input power voltage, V RMS (AC) (auto-ranging)	100-120V or 200-240V

Electrical requirements—one controller module:

Input voltage		**100 to 120V**			**200 to 240V**		
	Drives (in GB)	**Worst-case, single PSU**	**Typical**		**Worst-case, single PSU**	**Typical**	
			Per PSU	**System, two PSUs**		**Per PSU**	**System, two PSUs**
Input current measured, A	144 SAS	3.83	1.7	3.39	1.94	0.94	1.87
	300 SAS	4.44	1.95	3.89	2.23	1.08	2.16
	450 SAS	4.44	1.95	3.89	2.23	1.08	2.16
	600 SAS	3.75	1.84	3.68	1.90	0.94	1.87
	250 SATA	3.07	1.47	2.94	1.60	0.79	1.57
	500 SATA	3.22	1.55	3.09	1.68	0.81	1.61
	750 SATA	3.37	1.61	3.22	1.69	0.83	1.66
	1-TB SATA	3.37	1.61	3.22	1.69	0.83	1.66
	2-TB SATA	3.36	1.65	3.29	1.69	0.84	1.68

Input power measured, W	144 SAS	377	165	330	371	174	348
	300 SAS	439	191	381	431	204	407
	450 SAS	439	191	381	431	204	407
	600 SAS	375	182	364	360	178	355
	250 SATA	300	144	287	304	145	289
	500 SATA	319	151	301	322	147	294
	750 SATA	332	158	316	327	152.5	305
	1-TB SATA	332	158	316	327	152.5	305
	2-TB SATA	334	162	324	326	160	320
Thermal dissipation, BTU/hr	144 SAS	1,287	563	1,125	1,264	593	1,185
	300 SAS	1,497	649	1,298	1,470	669	1,338
	450 SAS	1,497	649	1,298	1,470	669	1,338
	600 SAS	1,279	621	1,242	1,228	606	1,211
	250 SATA	1,024	490	979	1,035	494	987
	500 SATA	1,088	514	1,028	1,099	501	1,002
	750 SATA	1,133	539	1,077	1,114	520	1,039
	1-TB SATA	1,133	539	1,077	1,114	520	1,039
	2-TB SATA	1,139	553	1.105	1.112	546	1.092

Electrical requirements—two controller modules:

Input voltage		100 to 120V			200 to 240V		
	Drives (in GB)	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	144 SAS	4.69	2.05	4.09	2.34	1.11	2.22
	300 SAS	4.94	2.38	4.75	2.45	1.19	2.37
	450 SAS	4.94	2.38	4.75	2.45	1.19	2.37
	600 SAS	4.73	2.29	4.57	2.32	1.15	2.29
	250 SATA	3.82	1.86	3.72	1.91	0.93	1.86
	500 SATA	3.94	1.90	3.80	1.97	0.97	1.93
	750 SATA	4.13	1.95	3.89	2.09	0.99	1.98
	1-TB SATA	4.13	1.95	3.89	2.09	0.99	1.98
	2-TB SATA	4.22	2.06	4.12	2.11	1.04	2.08
Input power measured, W	144 SAS	464	200	400	452	210	419
	300 SAS	488	233	465	476	224	448
	450 SAS	488	233	465	476	224	448
	600 SAS	458	229	458	448	216	432
	250 SATA	377	183	365	367	173	345
	500 SATA	389	186	372	381	180	360
	750 SATA	409	191	382	404	186	372
	1-TB SATA	409	191	382	404	186	372
	2-TB SATA	415	201	401	405	195	390

Thermal dissipation, BTU/hr	144 SAS	1,583	683	1,365	1,542	714.5	1,429
	300 SAS	1,665	794	1,587	1,624	715	1,527
	450 SAS	1,665	794	1,587	1,624	715	1,527
	600 SAS	1,562	781	1,562	1,528	737	1,474
	250 SATA	1,287	623	1,245	1,253	589	1,178
	500 SATA	1,328	634	1,268	1,298	614	1,227
	750 SATA	1,395	651	1,302	1,377	634	1,268
	1-TB SATA	1,395	651	1,302	1,377	634	1,268
	2-TB SATA	1,416	684	1,368	1,382	665	1,330

Electrical requirements—one controller module, no disk drives:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	1.67	0.8	1.60	0.9	0.45	0.89
Input power measured, W	165	77	153	160	75	149
Thermal dissipation, BTU/hr	563	261	521	544	253	506

Electrical requirements—two controller modules, no disk drives:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	2.63	1.12	2.23	1.34	0.59	1.18
Input power measured, W	254	108	215	240	104	208
Thermal dissipation, BTU/hr	866	366	731	818	355	709

2040 system characteristics

The following table lists the characteristics and requirements for your hardware.

Physical characteristics:

Weight—two controller modules and power supplies	Full (chassis with all disk drives) Empty (no internal disks)	66 lbs (29.9kg) 57 lbs (25.9kg)
Rack units		2
Height		3.5 in. (8.9 cm)
Width		17.6 in. (44.7 cm)
Depth		22.5 in. (57.2 cm)

Clearance dimensions:

Front—cooling	All versions—Two-post rack and four-post rack	6 in. (15.2 cm)
Rear—cooling		12 in. (30.5 cm)
Front of chassis—maintenance		30 in. (76.2 cm)
Rear of chassis—maintenance		36 in. (91.4 cm)

Environmental requirement:

Operating temperature range	50° F to 104° F (10° C to 40° C)
Non-operating temperature range	-40° F to 140° F (-40° C to 60° C)
Relative humidity	20 to 80% noncondensing
Acoustic level—Normal operating conditions at 23° C at sea level	≤ 60 dBA sound pressure (LpA) Sound power measurement not available
Altitude	10,000 ft. operating 40,000 ft. nonoperating
Input power frequency, Hz (AC)	50 to 60
Input power voltage, V RMS (AC) (auto-ranging)	100-120V or 200-240V

Electrical requirements—one controller module:

Input voltage		100 to 120V			200 to 240V		
	Drives (in GB)	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	300 SAS	4.08	1.98	3.96	2.3	1	2
	450 SAS	3.96	1.92	3.84	1.97	0.97	1.94
	600 SAS	3.87	1.92	3.83	1.91	0.96	1.91
	500 SATA	3.25	1.59	3.17	1.62	0.81	1.62
	750 SATA	3.38	1.64	3.27	1.69	0.84	1.68
	1-TB SATA	3.62	1.77	3.53	1.81	0.90	1.8
	2-TB SATA	3.34	1.61	3.22	1.66	0.84	1.67
Input power measured, W	300 SAS	404	194	387	392	189	378
	450 SAS	391	188	375	379	184	367
	600 SAS	387	188	376	368	181	361
	500 SATA	319	155	310	310	151	301
	750 SATA	333	161	322	324	157	314
	1-TB SATA	357	173	345	347	169	337
	2-TB SATA	329	158	315	319	156	312

Thermal dissipation, BTU/hr	300 SAS	1,378	660	1,320	1,337	645	1,289
	450 SAS	1,333	640	1,279	1,292	626	1,252
	600 SAS	1,319	641	1,282	1,254	616	1,231
	500 SATA	1,088	529	1,057	1,057	513	1,026
	750 SATA	1,136	549	1,098	1,105	536	1,071
	1-TB SATA	1,217	589	1,177	1,183	575	1,149
	2-TB SATA	1,122	537	1,074	1,088	532	1,064

Electrical requirements—two controller modules:

Input voltage		100 to 120V			200 to 240V		
	Drives (in GB)	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	300 SAS	4.85	2.33	4.66	2.39	1.18	2.35
	450 SAS	4.70	2.27	4.53	2.32	1.14	2.28
	600 SAS	4.44	2.16	4.32	2.18	1.09	2.18
	500 SATA	3.95	1.92	3.84	1.97	0.98	1.95
	750 SATA	4.10	1.99	3.98	2.04	1.01	2.01
	1-TB SATA	4.36	2.12	4.23	2.16	1.06	2.12
	2-TB SATA	3.92	1.94	3.88	1.97	0.98	1.96
Input power measured, W	300 SAS	480	229	457	464	224	447
	450 SAS	464	223	445	451	216	432
	600 SAS	440	212	424	425	208	415
	500 SATA	390	188	376	379	184	367
	750 SATA	405	195	389	393	191	381
	1-TB SATA	4.29	207	414	416	202	403
	2-TB SATA	387	189	378	382	186	371

Thermal dissipation, BTU/hr	300 SAS	1,637	779	1,558	1,582	762	1,524
	450 SAS	1,582	759	1,518	1,538	737	1,473
	600 SAS	1,500	723	1,445	1,449	708	1,415
	500 SATA	1,330	641	1,282	1,292	626	1,252
	750 SATA	1,381	664	1,327	1,340	650	1,299
	1-TB SATA	1,463	706	1,412	1,419	687	1,374
	2-TB SATA	1,319	644	1,288	1,302	633	1,265

Electrical requirements—one controller module, no disk drives:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	1.4	0.7	1.4	0.77	0.39	0.78
Input power measured, W	137	67	133	134	65	130
Thermal dissipation, BTU/hr	467	227	454	457	222	443

Electrical requirements—two controller modules, no disk drives:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	1.96	0.98	1.95	1.02	0.52	1.04
Input power measured, W	192	94	187	188	91	182
Thermal dissipation, BTU/hr	655	319	638	641	311	621

2050 system characteristics

The following table lists the characteristics and requirements for your hardware:

Physical characteristics:

Weight—two controller modules and power supplies	Full (chassis with all disk drives) Empty (no internal disks)	110 lbs (49.9 kg) 91 lbs (41.3 kg)
Rack units		4
Height		6.9 in. (17.5 cm)
Width		17.6 in. (44.7 cm)
Depth		22.5 in. (57.2 cm)

Clearance dimensions:

Front—cooling	All versions—Two-post rack and four-post rack	6 in. (15.2 cm)
Rear—cooling		12 in. (30.5 cm)
Front of chassis—maintenance		30 in. (76.2 cm)
Rear of chassis—maintenance		36 in. (91.4 cm)

Environmental requirements:

Operating temperature range	50° F to 104° F (10° C to 40° C)
Non-operating temperature range	-40° F to 140° F (-40° C to 60° C)
Relative humidity	20 to 80% noncondensing
Acoustic level—Normal operating conditions at 23° C at sea level	≤ 60 dBA sound pressure (LpA) Sound power measurement not available
Altitude	10,000 ft. operating 40,000 ft. nonoperating
Input power voltage, V RMS (AC) (auto-ranging)	100-120V or 200-240V

Electrical requirements—one controller module:

Input voltage		**100 to 120V**			**200 to 240V**		
	Drives (in GB)	**Worst-case, single PSU**	**Typical**		**Worst-case, single PSU**	**Typical**	
			Per PSU	**System, two PSUs**		**Per PSU**	**System, two PSUs**
Input current measured, A	144 SAS	5.64	2.38	4.76	2.82	1.33	2.65
	300 SAS	6.62	2.96	5.92	3.27	1.38	2.76
	450 SAS	6.62	2.96	5.92	3.27	1.38	2.76
	250 SATA	4.40	2.02	4.04	2.30	1.04	2.07
	500 SATA	4.64	2.18	4.36	2.33	1.09	2.17
	750 SATA	5.07	2.26	4.51	2.46	1.20	2.40
	1-TB SATA	5.07	2.26	4.51	2.46	1.20	2.40
Input power measured, W	144 SAS	560	233	465	547	251	502
	300 SAS	658	292	583	636	266	523
	450 SAS	658	292	583	636	266	523
	250 SATA	435	197	393	439	193	386
	500 SATA	459	213	425	447	204	408
	750 SATA	504	220	439	474	224	447
	1-TB SATA	504	220	439	474	224	447

Thermal dissipation, BTU/hr	144 SAS	1,909	794	1,587	1,864	855	1,710
	300 SAS	2,243	994	1,988	2,165	891	1,782
	450 SAS	2,243	994	1,988	2,165	891	1,782
	250 SATA	1,482	670	1,339	1,497	659	1,317
	500 SATA	1,564	724	1,448	1,523	696	1,392
	750 SATA	1,718	749	1,497	1,617	762	1,523
	1-TB SATA	1,718	749	1,497	1,617	762	1,523

Electrical requirements—two controller modules:

Input voltage		100 to 120V			200 to 240V		
	Drives (in GB)	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	144 SAS	6.31	2.84	5.68	3.09	1.45	2.89
	300 SAS	7.51	3.34	6.68	3.73	1.71	3.41
	450 SAS	7.51	3.34	6.68	3.73	1.71	3.41
	250 SATA	5.54	2.49	4.98	2.7	1.26	2.52
	500 SATA	5.74	2.84	5.67	2.89	1.33	2.65
	750 SATA	5.91	2.74	5.47	2.97	1.39	2.77
	1-TB SATA	5.91	2.74	5.47	2.97	1.39	2.77
Input power measured, W	144 SAS	628	279	558	600	275	550
	300 SAS	747	330	659	728	328	655
	450 SAS	747	330	659	728	328	655
	250 SATA	549	244	487	518	237	474
	500 SATA	567	277	554	561	252	503
	750 SATA	585	268	536	575	262	524
	1-TB SATA	585	268	536	575	262	524

Thermal dissipation, BTU/hr	144 SAS	2,142	951	1,902	2,044	938	1,876
	300 SAS	2,547	1,124	2,247	2,483	1,116	2,232
	450 SAS	2,547	1,124	2,247	2,483	1,116	2,232
	250 SATA	1,872	831	1,662	1,767	809	1,617
	500 SATA	1,932	946	1,891	1,913	857	1,714
	750 SATA	1,996	914	1,827	1,962	893	1,785
	1-TB SATA	1,996	914	1,827	1,962	893	1,785

Electrical requirements—one controller module, no disk drives:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	2.10	0.90	1.80	1.10	0.50	0.99
Input power measured, W	205	86.5	173	198	84	168
Thermal dissipation, BTU/hr	698	295	589	675	287	574

Electrical requirements—two controller modules, no disk drives:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	2.62	1.19	2.37	1.35	0.62	1.24
Input power measured, W	256	114	227	250	111	222
Thermal dissipation, BTU/hr	874	387	773	851	379	758

2220 characteristics

The following table lists the characteristics and requirements for your hardware:

Physical characteristics:

Weight	1 controller module, 12, 2TB disks	58.2 lbs (26.4 kg)
	2 controller modules, 12, 2TB disks	62.9 lbs (28.5 kg)
Rack units		2
Height		3.44 in. (8.7 cm)
Width		17.6 in. (44.7 cm)
Depth with cable management arm installed		24.1 in. (61.2)

Clearance dimensions:

Front—cooling	All versions—two-post rack and four-post rack	6 in. (15.3 cm)
Rear—cooling and maintenance		30 in. (76.2 cm)
Front—maintenance		30 in. (76.2 cm)

Environmental requirements:

Operating temperature range	50° F to 104° F (10° C to 40° C)
Non-operating temperature range	-40° F to 158° F (-40° C to 70° C)
Relative humidity—noncondensing	20 to 80% operating 5 to 95% nonoperating
Acoustic level—Normal operating conditions at 22° C at sea level	52.0 dBA sound pressure (LpA) 6.5 Bel sound power (LWAd)
Altitude	10,000 ft. operating 40,000 ft. nonoperating

Input power frequency, Hz (AC)	50 to 60
Input power voltage, V RMS (AC) (auto-ranging)	100-120V or 200-240V

Electrical requirements—one controller module, with and without the 10-GbE mezzanine card:

Input voltage		**100V**			**200V**		
	Drives (in GB)	**Worst-case, single PSU**	**Typical**		**Worst-case, single PSU**	**Typical**	
			Per PSU	**System, two PSUs**		**Per PSU**	**System, two PSUs**
Input current measured, A	100	3.26	0.75	1.5	1.61	0.44	0.88
	450	3.72	0.98	1.95	1.81	0.54	1.07
	900	3.76	0.99	1.99	1.82	0.55	1.10
	6x1-TB	3.57	0.92	1.86	1.77	0.52	1.03
	1-TB	4.18	1.3	2.6	2	0.67	1.33
	2-TB	4.26	1.34	2.63	2.14	0.68	1.36
	3-TB	4.32	1.37	2.74	2.14	0.69	1.38
	4-TB encrypted and unencrypted	3.3	1.24	2.48	1.69	0.64	1.27
	4x400-GB SSD and 8x4-TB	3.52	1.47	2.94	1.91	0.83	1.66

Input power measured, W	100	325	74	148	318	73	146
	450	370	96	192	357	95	189
	900	375	99	197	360	97	194
	6x1-TB	356	92	184	349	90	180
	1-TB	417	129	258	396	123	246
	2-TB	425	131	261	423	126	252
	3-TB	431	136	271	423	129	257
	4-TB encrypted and unencrypted	325	120	239	325	118	235
	4x400-GB SSD and 8x4-TB	354	145	289	341	142	283
Thermal dissipation, BTU/hr	100	1,110	253	506	1,086	250	499
	450	1,263	328	656	1.219	323	646
	900	1,280	337	673	1,229	332	663
	6x1-TB	1,215	314	628	1,192	308	615
	1-TB	1,424	441	881	1,352	420	840
	2-TB	1,451	446	891	1,444	431	861
	3-TB	1,471	463	925	1,444	439	878
	4-TB encrypted and unencrypted	1109	408	815	1109	401	802
	4x400-GB SSD and 8x4-TB	1208	493	986	1163	483	966

Electrical requirements—two controller modules, with and without the 10-GbE mezzanine card:

Input voltage		**100V**			**200V**		
	Drives (in GB)	**Worst-case, single PSU**	**Typical**		**Worst-case, single PSU**	**Typical**	
			Per PSU	**System, two PSUs**		**Per PSU**	**System, two PSUs**
Input current measured, A	100	4.13	1.13	2.25	2.01	0.59	1.17
	450	4.58	1.35	2.7	2.21	0.69	1.37
	600	4.58	1.14	2.27	2.23	0.70	1.39
	900 SAS	3.43	1.28	2.56	1.71	0.65	1.3
	1-TB	5.06	1.59	3.17	2.45	0.82	1.63
	1.2-TB SAS (12 drives)	3.45	1.29	2.58	1.73	0.67	1.34
	2-TB	5.16	1.63	3.25	2.50	0.83	1.66
	3-TB	5.31	1.67	3.33	2.59	0.98	1.95
	4-TB encrypted and unencrypted	4.32	1.56	3.12	2.16	0.80	1.59
	200 SSD	2.98	1.08	2.16	1.50	0.58	1.15
	4x200 SSD and 8x3-TB HDD	3.66	1.40	2.79	1.91	0.71	1.42
	4x400-GB SSD and 8x4-TB	3.76	1.40	2.80	1.90	0.73	1.45
	800-GB SSD	2.82	1.06	2.12	1.45	0.57	1.14
	1.6-TB SSD	2.96	0.99	1.98	1.52	0.55	1.10

Input power measured, W	100	411	112	223	398	106	211
	450	457	136	272	445	128	255
	600	457	133	265	440	129	258
	900 SAS	342	139	277	330	120	240
	1-TB	504	105	315	482	155	310
	1.2-TB SAS (12 drives)	344	128	256	333	125	249
	2-TB	515	167	323	495	158	316
	3-TB	529	166	331	513	189	377
	4-TB encrypted and unencrypted	430	155	310	420	152	303
	200 SSD	298	108	216	284	104	208
	4x200 SSD and 8x3-TB HDD	367	140	279	349	134	268
	4x400-GB SSD and 8x4-TB	374	137	273	350	132	263
	800-GB SSD	282	106	211	276	103	206
	1.6-TB SSD	295	96	191	288	97	194

Thermal dissipation, BTU/hr	100	1,403	381	762	1,359	361	721
	450	1,560	465	929	1,519	436	871
	600	1,560	453	905	1,502	441	881
	900 SAS	1,168	473	946	1,127	410	820
	1-TB	1,721	538	1,076	1,646	529	1,058
	1.2-TB SAS (12 drives)	1,176	438	876	1,139	426	852
	2-TB	1,758	552	1,103	1,690	535	1,079
	3-TB	1,806	565	1,130	1,751	644	1,287
	4-TB encrypted and unencrypted	1,468	529	1,058	1,434	518	1,035
	200-GB SSD	1,018	369	738	970	355	710
	4x200 SSD and 8x3-TB HDD	1,253	477	953	1,192	458	915
	4x400-GB SSD and 8x4-TB	1276	466	931	1194	449	897
	800-GB SSD	965	361	721	942	53	106
	1.6-TB SSD	1005	327	653	984	332	663

Electrical requirements: one controller and 12 4-TB encrypted and unencrypted drives:

Input voltage	100V			200V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	3.3	1.24	2.48	1.69	,64	1.27
Input power measured, W	325	120	239	325	118	235
Thermal dissipation, BTU/hr	1109	408	815	1109	401	802

Electrical requirements: one controller with four 400-GB drives and eight 4-TB encrypted and unencrypted drives:

Input voltage	100V			200V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	3.52	1.47	2.94	1.91	.83	1.66
Input power measured, W	354	145	289	341	142	283
Thermal dissipation, BTU/hr	1208	493	986	1163	483	966

Electrical requirements: two controllers with four 400-GB drives and eight 4-TB encrypted and unencrypted drives:

Input voltage	**100V**			**200V**		
	Worst-case, single PSU	**Typical**		**Worst-case, single PSU**	**Typical**	
		Per PSU	**System, two PSUs**		**Per PSU**	**System, two PSUs**
Input current measured, A	3.76	1.4	2.8	1.9	.73	1.45
Input power measured, W	374	137	273	350	132	263
Thermal dissipation, BTU/hr	1276	466	931	1194	449	897

2240-2 characteristics

The following table lists the characteristics and requirements for your hardware:

Physical characteristics:

Weight	1 controller module	50.7 lbs (23 kg)
	2 controller modules	57 lbs (25.4 kg)
Rack units		2
Height		3.34 in. (8.49 cm)
Width (without mount flanges)		17.61 in. (44.72 cm)
Depth (no cable management arms)		19.06 in. (48.4 cm)

Clearance dimensions:

Front—cooling	All versions—two-post rack and four-post rack	6 in. (15.3 cm)
Rear—cooling and maintenance		12 in. (30.5 cm)
Front—maintenance		25 in. (55.9 cm)

Environmental requirements:

Operating temperature range	50° F to 104° F (10° C to 40° C)
Non-operating temperature range	-40° F to 158° F (-40° C to 70° C)
Relative humidity—noncondensing	20 to 80% operating 5 to 95% nonoperating
Acoustic level—Normal operating conditions at 23° C at sea level	51.0 dBA sound pressure (LpA) 6.9 Bel sound power (LWAd)
Altitude	10,000 ft. operating 40,000 ft. nonoperating
Input power frequency, Hz (AC)	50 to 60
Input power voltage, V RMS (AC) (auto-ranging)	100-120V or 200-240V

2240-2 electrical requirements with one controller module with a FC or 10-GbE mezzanine card and either 450-GB or 600-GB disk drives:

Input voltage	100V			200V			215V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	4.11	1.36	2.72	2.01	0.71	1.41	1.87	0.68	1.35
Input power measured, W	409	135	270	397	132	263	397	132	263
Thermal dissipation, BTU/hr	1,396	461	922	1,355	449	898	1,355	449	898

2240-2 electrical requirements with one controller module, no mezzanine card and either 450-GB or 600-GB disk drives:

Input voltage	100V			200V			215V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	3.92	1.35	2.70	1.92	0.7	1.40	1.79	0.67	1.33
Input power measured, W	390	135	269	379	131	262	378	131	261
Thermal dissipation, BTU/hr	1,332	496	919	1,294	448	895	1,291	446	891

2240-2 electrical requirements with two controller modules with a FC or 10-GbE mezzanine card and either 450-GB or 600-GB disk drives:

Input voltage	100V			200V			215V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	5.07	1.81	3.61	2.47	0.89	1.78	2.29	0.82	1.66
Input power measured, W	509	179	357	487	170	340	487	169	338
Thermal dissipation, BTU/hr	1,738	610	1,219	1,663	581	1,161	1,663	577	1,154

2240-2 electrical requirements with two controller modules with a FC or 10-GbE mezzanine card and 900-GB disk drives:

Input voltage	100V			200V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	4.45	1.86	3.71	2.23	0.94	1.88
Input power measured, W	450	185	370	420	180	360
Thermal dissipation, BTU/hr	1,536	632	1,263	1,434	615	1,229

2240-2 electrical requirements with two controller modules, no mezzanine card and either 450-GB or 600-GB disk drives

Input voltage	100V			200V			215V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	4.76	1.8	3.60	2.31	0.88	1.76	2.15	0.82	1.64
Input power measured, W	474	178	356	456	170	339	456	168	336
Thermal dissipation, BTU/hr	1,618	608	1,215	1,557	579	1,157	1,557	274	1,147

2240-2 electrical requirements with two controller modules, no mezzanine card 900-GB disk drives

Input voltage	100V			200V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	4.45	1.86	3.71	2.23	0.94	1.88
Input power measured, W	450	185	370	420	180	360
Thermal dissipation, BTU/hr	1,536	632	1,263	1,434	615	1,229

2240-2 electrical requirements with two controller modules, no mezzanine card 1.2-TB disk drives

Input voltage	100V			200V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	4.78	1.91	3.82	2.36	0.96	1.92
Input power measured, W	477	191	381	462	187	373
Thermal dissipation, BTU/hr	1,632	651	1,302	1,580	373	1,274

2240-2 electrical requirements with two controller modules, no mezzanine card 200-GB SSD disk drives

Input voltage		100V			200V		
	Drives (in GB)	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	200 SSD	3.0	1.36	2.71	1.72	0.70	1.4
	4x200 SSD and 20x900-GB HDD	4.18	1.71	3.41	2.07	0.87	1.73
Input power measured, W	200 SSD	300	135	270	335	134	267
	4x200 SSD and 20x900-GB HDD	420	171	342	408	178	356
Thermal dissipation, BTU/hr	200 SSD	1,024	461	922	1,144	456	912
	4x200 SSD and 20x900-GB HDD	1,434	584	1,168	1,393	608	1,215

2240-2 electrical requirements with two controller modules, no mezzanine card 400-GB SSD disk drives

Input voltage		100V			200V		
	Drives (in GB)	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	4x400GB SSD and 20x1.2TB SAS	4.44	1.82	3.63	2.25	0.90	1.79
	12x400GB SSD	2.93	1.15	2.30	1.46	0.59	1.17
	24x400GB SSD	3.46	1.40	2.80	1.74	0.72	1.43
Input power measured, W	4x400GB SSD and 20x1.2TB SAS	445	180	359	422	171	341
	12x400GB SSD	287	111	222	278	107	213
	24x400GB SSD	345	139	278	331	135	270
Thermal dissipation, BTU/hr	4x400GB SSD and 20x1.2TB SAS	1518	613	1225	1440	582	1163
	12x400GB SSD	979	379	758	948	364	727
	24x400GB SSD	1177	474	948	1129	461	921

2240-2 electrical requirements with two controller modules, no mezzanine card 800-GB SSD disk drives

Input voltage	100V			200V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	3.54	1.4	2.8	1.75	0.72	1.43
Input power measured, W	354	141	281	344	138	276
Thermal dissipation, BTU/hr	1,209	480	960	1,175	471	942

2240-2 electrical requirements with two controller modules, no mezzanine card and 24 1.6-TB-GB SSD disk drives

Input voltage	100V			200V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	2.96	0.99	1.98	1.52	0.55	1.10
Input power measured, W	295	96	191	288	97	194
Thermal dissipation, BTU/hr	1005	327	653	984	332	663

2240-4 characteristics

The following table lists the characteristics and requirements for your hardware:

Physical characteristics:

Weight	1 controller module	102.3 lbs (46.4 kg)
	2 controller modules	107.8 lbs (48.9 kg)
Rack units		4
Height		7 in. (17.8 cm)
Width		19 in. (48 cm)
Depth		24 in. (48 cm)
Depth with cable management		28 in. (71.1 cm)

Clearance dimensions:

Front—cooling	All versions—two-post rack and four-post rack	6 in. (15.2 cm)
Rear—cooling and maintenance		12 in. (30.5 cm)
Front—maintenance		25 in. (55.9 cm)

Environmental requirements:

Operating temperature range	50° F to 104° F (10° C to 40° C)
Non-operating temperature range	-40° F to 158° F (-40° C to 70° C)
Relative humidity—noncondensing	20 to 80% operating 5 to 95% nonoperating
Acoustic level—Normal operating conditions at 23° C at sea level	49.6 dBA sound pressure (LpA) 6.9 Bel sound power (LWAd)
Altitude	10,000 ft. operating 40,000 ft. nonoperating
Input power frequency, Hz (AC)	50 to 60
Input power voltage, V RMS (AC) (auto-ranging)	100-120V or 200-240V

2240-4 electrical requirements with one controller module with a FC or 10-GbE mezzanine card and either 1-TB, 2-TB or 3-TB disk drives:

Input voltage	100V			200V			215V		
	Worst-case, 2+2 PSU	Typical		Worst-case, 2+2 PSU	Typical		Worst-case, 2+2 PSU	Typical	
		Per PSU	System, four PSUs		Per PSU	System, four PSUs		Per PSU	System, four PSUs
Input current measured, A	5.39	1.23	4.93	2.71	0.63	2.53	2.56	0.6	2.41
Input power measured, W	537	123	489	524	119	477	521	119	475
Thermal dissipation, BTU/hr	1,833	417	1,669	1,789	407	1,628	1,779	406	1,622

2240-4 electrical requirements with one controller module, no mezzanine card and either 1-TB or 2-TB disk drives:

Input voltage	100V			200V			215V		
	Worst-case, 2+2 PSU	Typical		Worst-case, 2+2 PSU	Typical		Worst-case, 2+2 PSU	Typical	
		Per PSU	System, four PSUs		Per PSU	System, four PSUs		Per PSU	System, four PSUs
Input current measured, A	5.34	1.21	4.85	2.68	0.63	2.5	2.53	0.59	2.37
Input power measured, W	533	121	482	517	117	468	515	117	466
Thermal dissipation, BTU/hr	1,820	412	1,646	1,765	400	1,598	1,758	398	1,591

2240-4 electrical requirements with one controller module, no mezzanine card and 3-TB disk drives:

Input voltage	100V			200V			215V		
	Worst-case, 2+2 PSU	Typical		Worst-case, 2+2 PSU	Typical		Worst-case, 2+2 PSU	Typical	
		Per PSU	System, four PSUs		Per PSU	System, four PSUs		Per PSU	System, four PSUs
Input current measured, A	5.36	0.49	4.95	2.7	0.63	2.53	2.55	0.6	2.4
Input power measured, W	533	122	489	520	119	476	518	119	475
Thermal dissipation, BTU/hr	1,820	417	1,669	1,775	406	1,625	1,768	406	1,622

2240-4 electrical requirements with one controller module, no mezzanine card and 24 400-GB SSD disk drives:

Input voltage	100V			200V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	3.52	1.42	2.84	1.91	0.83	1.66
Input power measured, W	354	145	289	341	142	283
Thermal dissipation, BTU/hr	1208	493	986	1163	483	966

2240-4 electrical requirements with two controller modules with a FC or 10-GbE mezzanine card and either 1-TB or 2-TB disk drives, or 10-GbE mezzanine card and 3-TB disk drives:

Input voltage	100V			200V			215V		
	Worst-case, 2+2 PSU	Typical		Worst-case, 2+2 PSU	Typical		Worst-case, 2+2 PSU	Typical	
		Per PSU	System, four PSUs		Per PSU	System, four PSUs		Per PSU	System, four PSUs
Input current measured, A	6.0	1.49	5.65	3.02	0.74	2.94	2.82	0.7	2.8
Input power measured, W	597	133	562	584	140	560	578	140	561
Thermal dissipation, BTU/hr	2,038	480	1,919	1,994	478	1,912	1,973	497	1,915

2240-4 electrical requirements with two controller modules with a FC mezzanine card and 3-TB disk drives:

Input voltage	100V			200V			215V		
	Worst-case, 2+2 PSU	Typical		Worst-case, 2+2 PSU	Typical		Worst-case, 2+2 PSU	Typical	
		Per PSU	System, four PSUs		Per PSU	System, four PSUs		Per PSU	System, four PSUs
Input current measured, A	6.02	1.4	5.74	3.03	0.73	2.91	2.84	0.69	2.76
Input power measured, W	599	143	571	586	139	554	581	138	551
Thermal dissipation, BTU/hr	2,045	487	1.949	2,000	473	1,891	1,983	470	1,881

2240-4 electrical requirements with two controller modules, no mezzanine card and either 1-TB or 2-TB disk drives:

Input voltage	100V			200V			215V		
	Worst-case, 2+2 PSU	Typical		Worst-case, 2+2 PSU	Typical		Worst-case, 2+2 PSU	Typical	
		Per PSU	System, four PSUs		Per PSU	System, four PSUs		Per PSU	System, four PSUs
Input current measured, A	5.87	2.76	5.52	2.94	1.40	2.79	2.76	1.33	2.66
Input power measured, W	582	273	545	568	266	531	565	265	529
Thermal dissipation, BTU/hr	1,987	931	1,861	1,939	907	1,813	1,929	903	1,806

2240-4 electrical requirements with two controller modules, no mezzanine card and 3-TB disk drives:

Input voltage	100V			200V			215V		
	Worst-case, 2+2 PSU	Typical		Worst-case, 2+2 PSU	Typical		Worst-case, 2+2 PSU	Typical	
		Per PSU	System, four PSUs		Per PSU	System, four PSUs		Per PSU	System, four PSUs
Input current measured, A	5.97	1.38	5.53	3.01	0.71	2.82	2.83	0.67	2.67
Input power measured, W	595	137	547	581	134	536	578	133	531
Thermal dissipation, BTU/hr	2,031	474	1,867	1,983	458	1,830	1,973	453	1,813

2240-4 electrical requirements with two controller modules and 12 disk drives:

Input voltage	100V			200V			215V		
	Worst-case, 2+2 PSU	Typical		Worst-case, 2+2 PSU	Typical		Worst-case, 2+2 PSU	Typical	
		Per PSU	System, four PSUs		Per PSU	System, four PSUs		Per PSU	System, four PSUs
Input current measured, A	4.4	1.1	4.2	2.24	0.55	2.19	2.13	0.53	2.1
Input power measured, W	441	104	416	428	102	407	426	102	406
Thermal dissipation, BTU/hr	1,506	355	1,420	1,461	348	1,390	1,454	347	1,386

2240-4 electrical requirements with two controller modules and 24 SAS 4-TB encrypted and unencrypted disk drives:

Input voltage	100V			200V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	5.44	2.74	5.48	2.67	0.80	2.69
Input power measured, W	542	272	544	510	256	511
Thermal dissipation, BTU/hr	1,850	929	1,857	1,744	871	1,741

2240-4 electrical requirements with two controller modules, no mezzanine card 200-GB SSD disk drives

Input voltage		100V			200V		
	Drives (in GB)	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	200 SSD	3.94	1.77	3.54	2.06	0.99	1.98
	4x200 SSD and 20x3-TB HDD	5.94	2.53	5.06	2.99	1.29	2.57
Input power measured, W	200 SSD	391	176	352	380	171	342
	4x200 SSD and 20x3-TB HDD	5.89	252	503	570	243	486
Thermal dissipation, BTU/hr	200 SSD	1,335	601	1,202	1,297	584	1,168
	4x200 SSD and 20x3-TB HDD	2,011	859	1,717	1,946	830	1,659

2240-4 electrical requirements with two controller modules, no mezzanine card and 24 400-GB SSD disk drives

Input voltage	100V			200V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	4.06	1.77	3.53	2.71	1.18	2.36
Input power measured, W	406	177	354	392	172	344
Thermal dissipation, BTU/hr	1385	604	1208	1337	587	1174

2520 characteristics

The following table lists the characteristics and requirements for your hardware:

Note
Equipment weight is the heaviest recorded weight for the identified configuration. Actual weight may be less, depending on the type of disk drive in the system.

Physical characteristics:

Weight	1 controller module, 6 disk drives	48.7 lbs (22.1 kg)
	1 controller module, 12 disk drives	54.2 lbs (24.6 kg)
	2 controller modules, 6 disk drives	49.6 lbs (22.5 kg)
	2 controller modules, 12 disk drives	58.6 lbs (26.6 kg)
Rack units		2U
Height		3.44 in. (8.7 cm)
Width with mounting flanges		19.0 in. (48.3 cm)
Depth with cable management arm installed		23.1 in. (58.7 cm)

Clearance dimensions:

Front—cooling	All versions—two-post rack and four-post rack	6 in. (15.3 cm)
Rear—cooling and maintenance		24 in. (61.0 cm)
Front—maintenance		13 in. (33.0 cm)

Environmental requirements:

Operating temperature range	50° F to 104° F (10° C to 40° C)
Non-operating temperature range	-40° F to 158° F (-40° C to 70° C)

Relative humidity—noncondensing	20 to 80% operating 5 to 95% nonoperating
Acoustic level—Normal operating conditions at 22° C at sea level	49.6 dBA sound pressure (LpAm) 6.2 Bel sound power (LWAd)
Altitude	10,000 ft. operating 40,000 ft. nonoperating
Input power frequency, Hz (AC)	50 to 60
Input power voltage, V RMS (AC) (auto-ranging)	100-120V or 200-240V

Electrical requirements—one controller module, 6 disk drives:

Input voltage		100V			200V		
	Drives	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	6-TB	3.13	1.11	2.21	1.58	0.55	1.09
	4x6-TB, 2x200-GB	2.64	0.95	1.89	1.41	0.47	0.94
	4x6-TB, 2x400-GB	2.64	0.95	1.89	1.41	0.47	0.94
Input power measured, W	6-TB	309	110	219	308	106	212
	4x6-TB, 2x200-GB	259	92	184	275	91	181
	4x6-TB, 2x400-GB	259	92	184	275	91	181
Thermal dissipation, BTU/hr	6-TB	1,054	371	743	1,050	362	723
	4x6-TB, 2x200-GB	883	314	627	938	309	617
	4x6-TB, 2x400-GB	883	314	627	938	309	617

Electrical requirements—one controller module, 12 disk drives:

Input voltage		100V			200V		
	Drives	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	1.2-TB	4.02	0.97	1.94	1.95	0.48	0.96
	1.6-TB	3.70	0.88	1.75	1.77	0.44	0.87
	2-TB	4.51	1.23	2.46	2.21	0.60	1.19
	3-TB	4.80	1.22	2.43	2.30	0.59	1.17
	3-TB NL-SAS	4.56	0.98	1.96	2.23	0.60	1.20
	4-TB	4.60	1.18	2.35	2.22	0.60	1.19
	4-TB NL-SAS	4.43	1.13	2.25	2.17	0.62	1.23
	6-TB	3.62	1.38	2.76	1.78	0.69	1.38
	200-GB	3.10	1.20	2.39	1.46	0.56	1.11
	400-GB	3.60	0.87	1.74	1.73	0.43	0.85
	600-GB	4.20	1.09	2.18	2.07	0.55	1.09
	800-GB	3.00	1.17	2.34	1.47	0.57	1.14
	900GB	4.00	0.97	1.94	1.95	0.48	0.95
	8x6-TB, 4x200-GB	3.24	1.22	2.43	1.61	0.62	1.23
	8x6-TB, 4x400-GB	3.24	1.22	2.43	1.61	0.62	1.23
	4x400-GB, 8x1.2-TB	4.30	0.95	1.90	2.11	0.47	0.94
	4x400-GB, 8x600-GB	3.7	0.89	1.77	1.78	0.44	0.88
	4x400-GB, 8x900-GB	3.7	0.89	1.77	1.78	0.88	0.88
	4x400-GB, 8x2-TB	4.17	0.92	1.84	2.06	0.49	0.98

Input power measured, W	1.2-TB	392	95	189	380	94	187
	1.6-TB	350	85	170	337	83	166
	2-TB	444	120	240	430	115	230
	3-TB	469	100	200	449	114	227
	3-TB NL-SAS	469	100	200	449	114	227
	4-TB	450	115	229	433	117	233
	4-TB NL-SAS	450	115	229	433	117	233
	6-TB	357	136	272	338	131	262
	200-GB	298	117	233	284	108	215
	400-GB	350	85	170	337	83	166
	600-GB	416	107	213	404	106	211
	800-GB	293	114	228	286	112	223
	900GB	392	95	189	380	94	187
	8x6-TB, 4x200-GB	320	120	240	306	117	233
	8x6-TB, 4x400-GB	320	120	240	306	117	233
	4x400-GB, 8x1.2-TB	424	93	185	412	92	183
	4x400-GB, 8x600-GB	360	87	173	348	85	170
	4x400-GB, 8x900-GB	360	173	173	348	85	170
	4x400-GB, 8x2-TB	424	93	185	412	92	183

Thermal dissipation, BTU/hr	1.2-TB	1,337	328	644	1,296	319	638
	1.6-TB	1,194	290	580	1,149	114	566
	2-TB	1,514	409	818	1,466	392	784
	3-TB	1,599	341	682	1,531	387	774
	3-TB NL-SAS	1,599	341	682	1,531	387	774
	4-TB	1,535	391	781	1,477	398	795
	4-TB NL-SAS	1,535	391	781	1,477	398	795
	6-TB	1,217	464	928	1,153	447	893
	200-GB	1,016	398	795	968	367	733
	400-GB	1,194	290	580	1,149	283	566
	600-GB	1,419	363	726	1,378	360	720
	800-GB	999	389	777	975	380	760
	900GB	1,337	322	644	1,296	319	638
	8x6-TB, 4x200-GB	1,091	409	818	1,043	398	795
	8x6-TB, 4x400-GB	1,091	409	818	1,043	398	795
	4x400-GB, 8x1.2-TB	1,446	316	631	1,405	312	624
	4x400-GB, 8x600-GB	1,228	295	590	1,187	290	580
	4x400-GB, 8x900-GB	1,228	295	590	1,187	290	580
	4x400-GB, 8x2-TB	1,446	316	631	1,405	206	412

Electrical requirements—two controller modules, 6 disk drives:

Input voltage		100V			200V		
	Drives	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	1.2-TB	4.51	1.04	2.08	2.21	0.52	1.04
	1.6-TB	3.71	0.93	1.85	1.79	0.54	1.07
	2-TB	4.27	1.16	2.32	2.08	0.57	1.13
	3-TB	4.81	1.20	2.39	2.35	0.57	1.14
	4-TB	3.72	1.18	2.35	1.78	0.59	1.17
	6-TB	3.63	1.36	2.71	1.83	0.68	1.35
	4x6-TB, 2x200-GB	3.14	1.20	2.39	1.66	0.60	1.19
	4x6-TB, 2x400-GB	3.14	1.20	2.39	1.66	0.60	1.19
Input power measured, W	1.2-TB	442	102	203	430	101	201
	1.6-TB	378	96	191	366	94	188
	2-TB	413	113	226	405	110	219
	3-TB	471	117	233	458	112	223
	4-TB	362	115	229	347	113	226
	6-TB	359	134	268	352	132	264
	4x6-TB, 2x200-GB	309	117	234	325	116	232
	4x6-TB, 2x400-GB	309	117	234	325	116	232

Thermal dissipation, BTU/hr	1.2-TB	1,505	345	692	1,466	343	685
	1.6-TB	1,289	326	651	1,248	321	641
	2-TB	1,408	386	771	1,381	374	747
	3-TB	1,606	398	795	1,562	380	760
	4-TB	1,234	391	781	1,183	386	771
	6-TB	1,224	547	914	1,200	450	900
	4x6-TB, 2x200-GB	1,054	399	798	1,132	396	791
	4x6-TB, 2x400-GB	1,054	399	798	1,132	396	791

Electrical requirements—two controller modules, 12 disk drives:

Input voltage		100V			200V		
	Drives	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	1.2-TB	4.55	1.23	2.45	2.21	0.61	1.22
	1.6-TB	4.09	1.13	2.26	1.98	0.56	1.11
	2-TB	5.10	1.49	2.97	2.46	0.72	1.43
	3-TB	5.30	1.28	2.94	2.55	0.72	1.43
	3-TB NL-SAS	5.05	1.19	2.37	2.48	0.74	1.47
	4-TB	5.10	1.43	2.86	2.48	0.73	1.45
	4-TB NL-SAS	4.92	1.37	2.74	2.42	0.75	1.49
	6-TB	4.12	1.64	3.27	2.03	0.82	1.63
	200-GB	3.90	1.61	3.21	1.87	0.76	1.51
	400-GB	4.10	1.13	2.26	1.98	0.56	1.11
	600-GB	4.70	1.17	2.33	2.33	0.58	1.15
	800-GB	3.80	1.58	3.16	1.88	0.78	1.55
	900-GB	4.50	1.04	2.08	2.21	0.52	1.03
	4x200-GB, 8x6-TB	3.74	1.47	2.94	1.86	0.74	1.48
	4x400-GB, 8x1.2-TB	4.75	1.16	2.31	2.32	0.58	1.15
	4x400-GB, 8x6-TB	3.74	1.47	2.94	1.86	0.74	1.48
	4x400-GB, 8x600-GB	4.20	1.15	2.29	2.04	0.57	1.13
	4x400-GB, 8x900-GB	4.27	1.18	2.35	2.07	0.58	1.15

Input power measured, W	1.2-TB	442	120	239	430	119	237
	1.6-TB	400	110	220	387	108	216
	2-TB	494	145	290	480	140	280
	3-TB	519	144	287	499	139	277
	3-TB NL-SAS	519	144	287	499	139	277
	4-TB	500	140	279	483	142	283
	4-TB NL-SAS	500	140	279	483	142	283
	6-TB	410	163	326	395	158	316
	200-GB	378	157	313	364	148	295
	400-GB	400	110	220	387	108	216
	600-GB	466	114	227	454	113	225
	800-GB	373	154	308	366	152	303
	900-GB	442	102	203	430	101	201
	4x200-GB, 8x6-TB	372	146	292	363	144	287
	4x400-GB, 8x1.2-TB	464	113	225	452	112	223
	4x400-GB, 8x6-TB	372	146	292	363	144	287
	4x400-GB, 8x600-GB	410	112	223	398	110	220
	4x400-GB, 8x900-GB	416	115	229	404	113	226

Thermal dissipation, BTU/hr	1.2-TB	1,507	408	815	1,466	404	808
	1.6-TB	1,364	375	750	1,320	369	737
	2-TB	1,685	495	989	1,637	478	955
	3-TB	1,770	490	979	1,702	473	945
	3-TB NL-SAS	1,770	490	979	1,702	473	945
	4-TB	1,705	476	951	1,647	483	965
	4-TB NL-SAS	1,705	476	951	1,647	483	965
	6-TB	1,398	556	1,112	1,347	539	1,078
	200-GB	1,289	534	1,067	1,241	503	1,006
	400-GB	1,364	375	750	1,320	369	737
	600-GB	1,589	387	774	1,548	384	767
	800-GB	1,272	525	1,050	1,248	517	1,033
	900-GB	1,507	346	692	1,466	343	685
	4x200-GB, 8x6-TB	1,269	498	996	1,238	490	979
	4x400-GB, 8x1.2-TB	1,582	384	767	1,541	380	760
	4x400-GB, 8x6-TB	1,269	498	996	1,238	490	979
	4x400-GB, 8x600-GB	1,398	380	760	1,357	375	750
	4x400-GB, 8x900-GB	1,419	391	781	1,378	386	771

2552 characteristics

The following table lists the characteristics and requirements for your hardware:

Physical characteristics:

Weight	1 controller module, 12 disk drives	44.4 lbs (20.0 kg)
	1 controller module, 24 disk drives	50.4 lbs (22.9kg)
	2 controller modules, 12 disk drives	49.4 lbs (22.5 kg)
	2 controller modules, 24 disks drives	55.4 lbs (25.2 kg)
Rack units		2U
Height		3.34 in. (8.5 cm)
Width with mounting flanges		19.0 in. (48.3 cm)
Depth with cable management arm installed		23.1 in. (58.7 cm)

Clearance dimensions:

Front—cooling	All versions—two-post rack and four-post rack	6 in. (15.3 cm)
Rear—cooling and maintenance		24 in. (61.0 cm)
Front—maintenance		13 in. (33.0 cm)

Environmental requirements:

Operating temperature range	50° F to 104° F (10° C to 40° C)
Non-operating temperature range	-40° F to 158° F (-40° C to 70° C)
Relative humidity—noncondensing	20 to 80% operating 5 to 95% nonoperating
Acoustic level—Normal operating conditions at 22° C at sea level	49.6 dBA sound pressure (LpAm) 6.2 Bel sound power (LWAd)
Altitude	10,000 ft. operating 40,000 ft. nonoperating
Input power frequency, Hz (AC)	50 to 60

Input power voltage, V RMS (AC) (auto-ranging)	100-120V or 200-240V

Electrical requirements—one controller module:

Input voltage		**100V**			**200V**		
	Drives	**Worst-case, single PSU**	**Typical**		**Worst-case, single PSU**	**Typical**	
			Per PSU	**System, two PSUs**		**Per PSU**	**System, two PSUs**
Input current measured, A	24x1.2-TB	5.40	1.45	2.90	2.62	0.71	1.41
	24x1.6-TB	4.30	1.18	2.35	1,85	0.58	1.16
	24x200-GB	2.70	1.22	2.43	1.52	0.60	1.20
	24x400-GB	4.30	1.15	2.29	2.10	0.56	1.12
	24x600-GB	5.20	1.35	2.70	2.52	0.65	1.30
	24x800-GB	3.40	1.43	2.86	1.69		1.40
	24x900-GB	5.40	1.45	2.90	2.62	0.71	1.41
	12x1.6-TB, 12x1.2-TB	4.60	1.30	2.59	1.97	0.65	1.29
	4x400-GB, 20x1.2-TB	4.72	1.35	2.70	2.30	0.66	1.32
	4x400-GB, 20x900-GB	4.71	1.34	2.68	2.29	0.67	1.33
	6x1.6-TB, 18x1.2-TB	4.30	1.18	2.35	1.85	0.58	1.16

Input power measured, W	24x1.2-TB	531	142	283	511	137	273
	24x1.6-TB	423	115	229	361	113	225
	24x200-GB	260	119	237	295	117	234
	24x400-GB	418	117	223	409	110	220
	24x600-GB	511	132	263	491	127	253
	24-800-GB	338	140	279	330	137	273
	24x900-GB	531	142	283	571	167	333
	12x1.6-TB, 12x1.2-TB	447	127	253	385	125	249
	4x400-GB, 20x1.2-TB	458	132	263	449	130	260
	4x400-GB, 20x900-GB	456	131	261	447	129	258
	6x1.6-TB, 18x1.2-TB	423	115	229	361	113	225
Thermal dissipation, BTU/hr	24x1.2-TB	1,811	483	965	1,743	466	931
	24x1.6-TB	1,442	391	781	1,231	154	767
	24x200-GB	887	404	808	1.006	399	798
	24x400-GB	1,425	380	760	1,395	375	750
	24x600-GB	1,743	449	897	1,674	401	801
	24x800-GB	1,153	476	951	1,125	466	931
	24x900-GB	1,811	483	965	1,947	568	1,136
	12x1.6-TB, 12x1.2-TB	1,524	432	863	1,313	425	849
	4x400-GB, 20x1.2-TB	1,562	449	897	1,531	444	887
	4x400-GB, 20x900-GB	1,555	445	890	1,524	440	880
	6x1.6-TB, 18x1.2-TB	1,442	391	781	1,231	384	767

Electrical requirements—two controller modules:

Input voltage		100V			200V		
	Drives	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	24x1.2-TB	6.07	1.76	3.52	2.92	0.86	1.72
	24x1.6-TB	4.93	1.48	2.96	2.16	0.74	1.47
	24x200-GB	3.20	1.47	2.94	1.77	0.73	1.46
	24x400-GB	4.92	1.45	2.90	2.41	0.73	1.45
	24x600-GB	5.83	1.66	3.31	2.83	0.80	1.59
	24x800-GB	3.70	1.53	3.06	1.81	0.75	1.50
	24x900-GB	6.00	0.26	3.52	2.93	0.86	1.72
	12x1.6-TB, 12x1.2-TB	5.21	1.61	3.21	2.28	0.80	1.60
	4x400-GB, 20x1.2-TB	5.43	1.69	3.38	2.67	0.82	1.64
	4x400-GB, 20x900-GB	5.29	1.65	3.29	2.60	0.82	1.63
	6x1.6-TB, 18x1.2-TB	4.92	1.48	2.96	2.16	0.73	1.45
	12x1.2-TB	5.30	1.39	2.78	2.52	0.65	1.29
	12x1.6-TB	4.49	1.24	2.47	1.91	0.61	1.22
	12x400-GB	4.40	1.21	2.41	2.16	0.60	1.20
	12x600-GB	5.20	1.35	2.70	2.52	0.65	1.29

Input power measured, W	24x1.2-TB	591	172	333	571	167	333
	24x1.6-TB	483	145	289	421	143	285
	24x200-GB	310	144	287	345	142	284
	24x400-GB	478	142	283	469	140	280
	24x600-GB	571	162	323	551	157	313
	24x800-GB	364	149	298	354	147	293
	24x900-GB	591	172	343	571	167	333
	12x1.6-TB, 12x1.2-TB	507	157	313	445	155	309
	4x400-GB, 20x1.2-TB	534	165	330	520	160	320
	4x400-GB, 20x900-GB	516	161	321	507	159	318
	6x1.6-TB, 18x1.2-TB	483	145	289	421	143	285
	12x1.2-TB	519	134	271	499	131	261
	12x1.6-TB	435	121	241	373	119	237
	12x400-GB	430	118	235	421	116	232
	12x600-GB	511	132	263	491	127	253

Thermal dissipation, BTU/hr	24x1.2-TB	2.015	585	1,170	1,947	568	1,136
	24x1.6-TB	1,647	493	985	1,436	486	972
	24x200-GB	1,057	490	979	1,176	484	968
	24x400-GB	1,630	483	965	1,599	478	955
	24x600-GB	1,947	551	1,101	1,879	534	1,067
	24x800-GB	1,241	508	1,016	1,207	500	999
	24x900-GB	2,015	585	1,170	1,947	568	1,136
	12x1.6-TB, 12x1.2-TB	1,729	534	1,067	1,517	527	1,054
	4x400-GB, 20x1.2-TB	1,821	563	1,125	1,773	546	1,091
	4x400-GB, 20x900-GB	1,760	548	1,095	1,729	542	1,084
	6x1.6-TB, 18x1.2-TB	1,647	493	985	1,436	486	972
	12x1.2-TB	1,770	462	924	1,702	445	890
	12x1.6-TB	1,483	411	822	1,272	404	808
	12x400-GB	1,466	401	801	1,436	396	791
	12x600-GB	1,743	449	897	1,674	432	863

2554 characteristics

The following table lists the characteristics and requirements for your hardware:

Physical characteristics:

Weight	1 controller module, 12 disk drives	84 lbs (38.2 kg)
	1 controller module, 24 disk drives	102 lbs (46.4 kg)
	2 controller modules, 12 disks drives	89 lbs (40.5 kg)
	2 controller modules, 24 disks drives	107 lbs (48.6 kg)
Rack units		4U
Height		6.88 in. (17.5 cm)
Width (with mounting flanges)		19.0 in.(48.3 cm)
Depth with cable management arm installed		23.9 in. (60.7 cm)

Clearance dimensions:

Front—cooling	All versions—two-post rack and four-post rack	6 in. (15.3 cm)
Rear—cooling and maintenance		16 in. (40.7 cm)
Front—maintenance		26 in (66.0 cm)

Environmental requirements:

Operating temperature range	50° F to 104° F (10° C to 40° C)
Non-operating temperature range	-40° F to 158° F (-40° C to 70° C)
Relative humidity—noncondensing	20 to 80% operating 5 to 95% nonoperating
Acoustic level—Normal operating conditions at 22° C at sea level	49.6 dBA sound pressure (LpAm) 6.1 Bel sound power (LWAd)
Altitude	10,000 ft. operating 40,000 ft. nonoperating
Input power frequency, Hz (AC)	50 to 60

Input power voltage, V RMS (AC) (auto-ranging)	100-120V or 200-240V

Electrical requirements—one controller module:

Input voltage		100V			200V		
	Drives	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	24x200-GB	3.60	1.64	3.27	1.74	0.79	1.58
	24x400-GB	3.84	1.60	3.19	1.86	0.79	1.58
	4x200-GB, 20x6-TB	5.46	2.39	4.78	2.80	1.22	2.43
	4x400-GB, 20x6-TB	5.46	2.39	4.78	2.80	1.22	2.43
	24x2-TB	5.92	2.15	4.29	2.87	1.06	2.11
	24x3-TB	5.89	2.24	4.48	2.89	1.10	2.19
	24x4-TB	6.20	2.24	4.48	3.10	1.10	2.27
	24x4-TB NL-SAS	6.12	2.16	4.32	3.05	1.15	2.30
	24x6-TB	5.82	2.53	5.05	2.96	1.16	2.51
Input power measured, W	24x200-GB	351	160	319	340	155	309
	24x400-GB	371	156	311	363	153	306
	4x200-GB, 20x6-TB	541	237	474	532	231	462
	4x400-GB, 20x6-TB	541	237	474	532	231	462
	24x2-TB	580	209	418	559	204	408
	24x3-TB	577	219	437	564	212	424
	24x4-TB	618	219	437	605	221	442
	24x4-TB NL-SAS	618	219	437	605	221	442
	24x6-TB	577	250	500	562	239	477

Thermal dissipation, BTU/hr	24x200-GB	1,197	544	1,088	1,159	527	1,054
	24x400-GB	1,265	531	1,061	1,238	522	1,043
	4x200-GB, 20x6-TB	1,616	271	541	1,814	788	1,575
	4x400-GB, 20x6-TB	1,616	271	541	1,814	788	1,575
	24x2-TB	1,978	713	1,425	1.906	696	1,391
	24x3-TB	1,968	745	1,490	1,923	723	1.446
	24x4-TB	2,107	745	1,490	2,063	754	1,507
	24x4-TB NL-SAS	2,107	745	1,490	2,063	754	1,507
	24x6-TB	1,968	853	1,705	1,916	814	1,627

Electrical requirements—two controller modules:

Input voltage		100V			200V		
	Drives	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	24x200-GB	4.10	1.89	3.78	2.01	0.92	1.84
	24x2-TB	6.28	2.36	4.72	3.13	1.23	2.46
	24x3-TB	6.48	2.57	5.13	3.20	1.24	2.48
	24x400-GB	4.43	1.91	3.81	2.17	0.95	1.89
	24x4-TB	6.92	1.04	5.08	3.41	1.30	2.59
	24x4-TB NL-SAS	6.71	2.46	4.91	3.35	1.31	2.61
	24x6-TB	6.54	2.83	5.65	3.27	1.42	2.83
	12x2-TB	5.42	1.90	3.79	2.62	0.93	1.86
	12x3-TB	5.64	2.09	4.17	2.74	1.02	2.04
	12x400-GB	4.08	1.70	3.40	1.98	0.85	1.70
	12x4-TB	5.85	2.03	4.05	2.89	1.02	2.04
	4x200-GB, 20x6-TB	6.18	2.69	5.38	3.11	1.38	2.75
	4x400-GB, 20x6-TB	6.18	2.69	5.38	3.11	2.75	2.75

Input power measured, W	24x200-GB	401	185	369	390	180	359
	24x2-TB	640	239	478	619	234	468
	24x3-TB	637	249	497	624	242	484
	24x400-GB	431	186	371	423	183	366
	24x4-TB	678	249	497	665	251	502
	24x4-TB NL-SAS	678	249	497	665	251	502
	24x6-TB	650	281	562	628	269	538
	12x2-TB	532	185	370	511	180	360
	12x3-TB	547	204	407	534	197	394
	12x400-GB	395	168	335	387	165	330
	12x4-TB	576	198	395	563	200	400
	4x200-GB, 20x6-TB	615	268	535	599	257	513
	4x400-GB, 20x6-TB	615	268	535	599	257	513
Thermal dissipation, BTU/hr	24x200-GB	1,367	629	1,258	1,330	612	1,224
	24x2-TB	2,182	815	1,630	2,111	798	1,596
	24x3-TB	2,172	848	1,695	2,128	825	1,650
	24x400-GB	1,470	633	1,265	1,442	624	1,248
	24x4-TB	2,312	848	1,695	2,268	856	1,712
	24x4-TB NL-SAS	2,312	848	1,695	2,268	856	1,712
	24x6-TB	2,217	958	1,916	2,141	918	1,835
	12x2-TB	1,814	631	1,262	1,743	614	1,228
	12x3-TB	1,865	694	1,388	1,821	672	1,344
	12x400-GB	1,347	706	1,142	1,320	563	1,125
	12x4-TB	1,964	674	1,347	1,920	682	1,364
	4x200-GB, 20x6-TB	2,097	912	1,824	2,043	875	1,749
	4x400-GB, 20x6-TB	2,097	912	1,824	2,043	875	1,749

31xx series systems

31xx series characteristics

The following table lists the characteristics and requirements for your hardware.

Note

There is no Flash Cache 2 support for the 31xx series systems.

Physical characteristics:

Weight—one controller module	102 lbs (46.27 kg)
Weight—two controller modules	121 lbs (54.89 kg)
Rack units	6
Height	10.75 in. (27.3 cm)
Width	17.73 in. (45.0 cm)
Depth	24 in. (60.7 cm)

Clearance dimensions:

Front—cooling	All versions—two-post rack and four-post rack	6 in. (15.2 cm)
Rear—cooling		12 in. (30.5 cm)
Front—maintenance		30 in. (76.2 cm)
Rear—maintenance		36 in. (91.4 cm)

Environmental requirements:

Operating temperature range	50° F to 104° F (10° C to 40° C)
Non-operating temperature range	-40° F to 149° F (-40° C to 65° C)
Relative humidity	20 to 80% noncondensing

Acoustic level—Normal operating conditions at 22° C at sea level	≤ 61 dBA sound pressure (LpA) Sound power measurement not available
Input power frequency, Hz (AC)	50 to 60
Input power voltage, V RMS (AC) (auto-ranging)	100-120V or 200-240V

3140 electrical requirements—one controller module:

Input voltage	**100 to 120V**			**200 to 240V**			**-40 to -60V**		
	Worst-case, single PSU	**Typical**		**Worst-case, single PSU**	**Typical**		**Worst-case, single PSU**	**Typical**	
		Per PSU	**System, two PSUs**		**Per PSU**	**System, two PSUs**		**Per PSU**	**System, two PSUs**
Input current measured, A	3.98	1.89	3.77	1.97	0.97	1.93	8.38	4.88	9.75
Input power measured, W	396	187	373	385	183	366	336	195	389
Thermal dissipation, BTU/hr	1,350	636	1,272	1,313	625	1,249	1,146	664	1,327

3140 electrical requirements—two controller modules:

Input voltage	100 to 120V			200 to 240V			-40 to -60V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	7.38	2.99	5.97	3.60	1.49	2.98	15.27	7.62	15.23
Input power measured, W	736	297	594	712	291	581	612	304	607
Thermal dissipation, BTU/hr	2,509	1,013	2,026	2,427	991	1,981	2,088	1,036	2,071

3140 electrical requirements with two Performance Acceleration modules or Flash Cache modules—one controller module:

Input voltage	100 to 120V			200 to 240V			-40 to -60V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	4.06	1.93	3.86	2.01	0.99	1.98	8.55	5.03	10.05
Input power measured, W	402	192	383	396	190	379	343	201	401
Thermal dissipation, BTU/hr	1,372	654	1,307	1,352	647	1,293	1,170	684	1,368

3140 electrical requirements with four Performance Acceleration modules or Flash Cache modules—two controller modules:

Input voltage	100 to 120V			200 to 240V			-40 to -60V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	7.69	3.29	6.58	3.75	1.58	3.15	15.91	8.02	16.03
Input power measured, W	769	328	655	745	315	630	638	320	639
Thermal dissipation, BTU/hr	2,625	1,117	2,234	2,543	1,075	2,150	2,177	1,090	2,180

3160 electrical requirements—one controller module:

Input voltage	100 to 120V			200 to 240V			-40 to -60V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	4.80	2.25	4.50	2.38	1.16	2.32	10.07	5.90	11.79
Input power measured, W	476	220	440	460	225	450	404	235	470
Thermal dissipation, BTU/hr	1,625	751	1,502	1,570	768	1,535	1,378	802	1,604

3160 electrical requirements—two controller modules:

Input voltage	100 to 120V			200 to 240V			-40 to -60V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	9.25	3.88	7.76	4.40	1.90	3.80	18.78	8.08	16.15
Input power measured, W	916	380	760	860	378	755	752	323	646
Thermal dissipation, BTU/hr	3,126	1,297	2,594	2,935	1,289	2,577	2,566	1,102	2,204

3160 electrical requirements with two Performance Acceleration modules or Flash Cache modules—one controller module:

Input voltage	100 to 120V			200 to 240V			-40 to -60V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	4.90	2.31	4.62	2.44	1.19	2.38	10.33	6.05	12.09
Input power measured, W	487	227	453	478	230	460	414	241	482
Thermal dissipation, BTU/hr	1,662	773	1,546	1,631	785	1,570	1,412	823	1,645

3160 electrical requirements with four Performance Acceleration modules or Flash Cache modules—two controller modules:

Input voltage	100 to 120V			200 to 240V			-40 to -60V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	9.65	4.09	8.17	4.51	1.95	3.90	19.24	9.39	18.78
Input power measured, W	959	405	809	890	388	775	770	376	751
Thermal dissipation, BTU/hr	3,273	1,381	2,761	3,037	1,323	2,645	2,627	1,282	2,563

3170 electrical requirements—one controller module:

Input voltage	100 to 120V			200 to 240V			-40 to -60V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	5.07	2.37	4.74	2.52	1.19	2.38	10.75	6.09	12.18
Input power measured, W	505	235	470	493	230	459	430	243	486
Thermal dissipation, BTU/hr	1,722	801	1,602	1,680	782	1,564	1,467	829	1,658

3170 electrical requirements—two controller modules:

Input voltage	100 to 120V			200 to 240V			-40 to -60V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	9.74	4.07	8.14	4.69	2.02	4.03	20.00	10.34	20.68
Input power measured, W	969	405	810	930	394	788	800	414	827
Thermal dissipation, BTU/hr	3,305	1,381	2,761	3,170	1,343	2,686	2,730	1,411	2,822

3170 electrical requirements with four Performance Acceleration modules or Flash Cache modules—one controller module:

Input voltage	100 to 120V			200 to 240V			-40 to -60V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	5.27	2.49	4.98	2.62	1.25	2.5	20.00	10.34	20.68
Input power measured, W	525	247	494	513	241	482	800	414	827
Thermal dissipation, BTU/hr	1,790	843	1,685	1,749	822	1,644	2,730	1,411	2,822

3170 electrical requirements with eight Performance Acceleration modules or Flash Cache modules—two controller modules:

Input voltage	100 to 120V			200 to 240V			-40 to -60V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	10.54	4.49	8.98	5.08	2.22	4.44	21.67	11.39	22.77
Input power measured, W	1,048	447	894	1,006	434	868	867	456	911
Thermal dissipation, BTU/hr	3,574	1,525	3,049	3,430	1,480	2,960	2,958	1,555	3,109

32xx series systems

32xx series characteristics

The following table lists the characteristics and requirements for your hardware.

Note

Electrical requirements for systems containing performance accelerator, Flash Cache, and Flash Cache 2 modules are measured with the maximum number of these modules installed in the system. The maximum power draw is 25W.

Physical characteristics:

Weight—one controller module	67.3 lbs (30.5 kg)
Weight—two controller modules	79.5 lbs (36.1 kg)
Weight—controller and I/O expansion module	74.5 lbs (33.8 kg)
Rack units	3
Height	5.12 in. (13.0 cm)
Width	17.61 in. (44.7 cm)
Depth	24 in. (60.7 cm)

Clearance dimensions:

Front—cooling	All versions—two-post rack and four-post rack	10 in. (25.4 cm)
Rear—cooling		12 in. (30.5 cm)
Front—maintenance		30 in. (76.2 cm)
Rear—maintenance		30 in. (76.2 cm)

Environmental requirements:

Operating temperature range	50° F to 104° F (10° C to 40° C)
Non-operating temperature range	-40° F to 158° F (-40° C to 70° C)

Relative humidity	20 to 80% noncondensing
Acoustic level—Normal operating conditions at 23° C at sea level	55.4 dBA sound pressure (LpA) 7.1 Bel sound power (LWAd)
Altitude	10,000 ft. operating 40,000 ft. nonoperating
Input power frequency, Hz (AC)	50 to 60
Input power voltage, V RMS (AC) (auto-ranging)	100-120V or 200-240V

3210 electrical requirements with one 256-GB Flash Cache or Flash Cache 2 module—one controller module:

Input voltage	**100 to 120V**			**200 to 240V**			**-40 to -60V**		
	Worst-case, single PSU	**Typical**		**Worst-case, single PSU**	**Typical**		**Worst-case, single PSU**	**Typical**	
		Per PSU	**System, two PSUs**		**Per PSU**	**System, two PSUs**		**Per PSU**	**System, two PSUs**
Input current measured, A	4.22	1.52	3.03	2.11	0.83	1.66	10.45	3.65	7.30
Input power measured, W	421	150	299	411	147	293	418	146	292
Thermal dissipation, BTU/hr	1,437	511	1,021	1,403	500	1,000	1,427	499	997

3210 electrical requirements with one 256-GB Flash Cache or Flash Cache 2 module per controller module—two controller modules:

Input voltage	100 to 120V			200 to 240V			-40 to -60V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	6.27	2.32	4.64	3.11	1.19	2.38	15.8	5.8	11.6
Input power measured, W	626	231	462	612	225	450	632	232	464
Thermal dissipation, BTU/hr	2,137	789	1,577	2,089	768	1,536	2,157	792	1,584

3220 electrical requirements with one 512-GB Flash Cache or Flash Cache 2 module—one controller module:

Input voltage	100 to 120V			200 to 240V			-40 to -60V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	4.31	1.55	3.09	2.41	0.87	1.73	10.7	3.78	7.55
Input power measured, W	431	155	309	421	152	303	428	151	302
Thermal dissipation, BTU/hr	1,437	511	1,021	1,403	500	1,000	1,427	499	997

3220/3240 electrical requirements with a 256-GB or 512-GB Flash Cache or Flash Cache 2 module per controller module—two controller modules:

Input voltage	100 to 120V			200 to 240V			-40 to -60V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	6.37	2.35	4.70	3.15	1.21	2.41	15.9	5.90	11.8
Input power measured, W	635	233	466	620	228	456	636	236	472
Thermal dissipation, BTU/hr	2,168	796	1,591	2,116	779	1,557	1,611	1,086	2,171

Note

The 3220 does not support the 256-GB Flash Cache module

3220/3240 electrical requirements with a 256-GB or 512-GB Flash Cache or Flash Cache 2 module and one I/O expansion module:

Input voltage	100 to 120V			200 to 240V			-40 to -60V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	5.01	1.86	3.71	2.50	0.98	1.96	12.55	4.60	9.2
Input power measured, W	500	184	368	478	180	360	502	184	368
Thermal dissipation, BTU/hr	1,707	628	1,256	1,632	615	1,229	1,714	628	1,256

Note

The 3220 does not support the 256-GB Flash Cache module

3270 electrical requirements with one 512-GB or one 1-TB Flash Cache or Flash Cache 2 module per controller module—two controller modules:

Input voltage	100 to 120V			200 to 240V			-40 to -60V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	7.28	2.78	5.56	3.58	1.42	2.83	18.2	6.95	13.9
Input power measured, W	728	278	552	707	271	541	728	278	556
Thermal dissipation, BTU/hr	2,485	942	1,884	2,413	924	1,847	2,485	949	1,898

3250/3270 electrical requirements with one 512-GB or one 1-TB Flash Cache or Flash Cache 2 module and one I/O expansion module:

Input voltage	100 to 120V			200 to 240V			-40 to -60V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	5.47	2.07	4.14	2.73	1.07	2.13	13.55	5.05	10.1
Input power measured, W	547	204	408	533	199	398	542	202	404
Thermal dissipation, BTU/hr	1,867	697	1,393	1,820	680	1,359	1,850	690	1,379

60xx series systems

60xx series characteristics

The following table lists the characteristics and requirements for your hardware.

Note

There is no Flash Cache 2 support for the 60xx series systems.

Physical characteristics:

Weight	122 lbs (55.34 kg)
Rack units	6
Height	10.32 in. (26.21 cm)
Width	17.53 in. (44.52 cm)
Depth (including cable management tray)	29 in. (73.66 cm)

Clearance dimensions:

Front—cooling	All versions—two-post rack and four-post rack	6 in. (15.2 cm)
Rear—cooling		12 in. (30.5 cm)
Front of chassis—maintenance		25 in. (63.5 cm)
Rear of chassis—maintenance		40 in. (102 cm)

Environmental requirements:

Operating temperature range	50° F to 104° F (10° C to 40° C)
Non-operating temperature range	-40° F to 158° F (-40° C to 70° C)
Relative humidity	20 to 80% noncondensing
Acoustic level—Normal operating conditions at 22° C at sea level	56.5 dBA sound pressure (LpA) Sound power measurement not available

Input power frequency, Hz (AC)	50 to 60
Input power voltage, V RMS (AC) (auto-ranging)	100-120V or 200-240V

6030/FAS6040 electrical requirements:

Input voltage	**100 to 120V**			**200 to 240V**		
	Worst-case, single PSU	**Typical**		**Worst-case, single PSU**	**Typical**	
		Per PSU	**System, two PSUs**		**Per PSU**	**System, two PSUs**
Input current measured, A	9.75	2.87	5.74	4.87	1.57	3.14
Input power measured, W	968	279	557	934	217	541
Thermal dissipation, BTU/hr	3,301	949	1,898	3,185	923	1,845

6030/FAS6040 electrical requirements with four Performance Acceleration modules or Flash Cache modules:

Input voltage	**100 to 120V**			**200 to 240V**		
	Worst-case, single PSU	**Typical**		**Worst-case, single PSU**	**Typical**	
		Per PSU	**System, two PSUs**		**Per PSU**	**System, two PSUs**
Input current measured, A	10.15	3.03	6.05	5.06	1.65	3.29
Input power measured, W	1,009	293	585	969	289	578
Thermal dissipation, BTU/hr	3,440	998	1,996	3,305	985	1,969

6070/FAS6080 electrical requirements:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	11.68	3.63	7.25	5.76	1.96	3.91
Input power measured, W	1,162	352	704	1,115	231	693
Thermal dissipation, BTU/hr	3,961	1,201	2,401	3,804	1,182	2,363

6070/FAS6080 electrical requirements with five Performance Acceleration modules or Flash Cache modules:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	12.11	3.85	7.70	5.97	2.07	4.14
Input power measured, W	1,203	376	752	1,158	368	736
Thermal dissipation, BTU/hr	4,104	1,283	2,566	3,950	1,255	2,509

62xx series systems

62xx series characteristics

The following table lists the characteristics and requirements for your hardware.

Note

Electrical requirements for systems containing performance accelerator, Flash Cache, and Flash Cache 2 modules are measured with the maximum number of these modules installed in the system. The maximum power draw is 25W.

Physical characteristics:

Weight	Single controller module	99.2 lbs (45 kg)
	Controller and I/O expansion module	125.7 lbs (57 kg)
	Two controller modules	130.1 lbs (59 kg)
Rack units		6
Height		10.2 in. (25.86 cm)
Width		17.6 in. (44.68 cm)
Depth (including cable management tray)		29 in. (73.66 cm)

Clearance dimensions:

Front—cooling	All versions—two-post rack and four-post rack	6 in. (15.2 cm)
Rear—cooling		12 in. (30.5 cm)
Front of chassis—maintenance		30 in. (76.2 cm)
Rear of chassis—maintenance		36 in. (91.4 cm)

Environmental requirements:

Operating temperature range	50° F to 104° F (10° C to 40° C)
Non-operating temperature range	-40° F to 158° F (-40° C to 70° C)

Relative humidity	20 to 80% noncondensing
Acoustic level—Normal operating conditions at 23° C at sea level	61.3 dBA sound pressure (LpA) 7.5 Bel sound power (LWAd)
Altitude	10,000 ft. operating 40,000 ft. nonoperating
Input power frequency, Hz (AC)	50 to 60
Input power voltage, V RMS (AC) (auto-ranging)	100-120V or 200-240V

6210 single-controller module electrical requirements:

Input voltage	**100 to 120V**			**200 to 240V**		
	Worst-case, single PSU	**Typical**		**Worst-case, single PSU**	**Typical**	
		Per PSU	**System, two PSUs**		**Per PSU**	**System, two PSUs**
Input current measured, A	5	2.25	4.5	2.5	1.15	2.3
Input power measured, W	490	215	430	480	208	415
Thermal dissipation, BTU/hr	1,673	734	1,468	1,639	709	1,417

6210 two controller modules electrical requirements:

Input voltage	**100 to 120V**			**200 to 240V**		
	Worst-case, single PSU	**Typical**		**Worst-case, single PSU**	**Typical**	
		Per PSU	**System, two PSUs**		**Per PSU**	**System, two PSUs**
Input current measured, A	N/A			4.8	2.05	4.1
Input power measured, W	N/A			930	380	760
Thermal dissipation, BTU/hr	N/A			3,174	1,297	2,594

6220 single-controller module electrical requirements:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	5	2.3	4.5	2.5	1.2	2.3
Input power measured, W	490	215	430	480	208	415
Thermal dissipation, BTU/hr	1,673	734	1,468	1,639	709	1,417

6220 two controller modules electrical requirements:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	N/A			4.8	2.1	4.1
Input power measured, W	N/A			930	380	760
Thermal dissipation, BTU/hr	N/A			3,174	1,297	2,594

6240 controller module and I/O expansion module electrical requirements:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	9.3	3.3	6.6	4.5	1.65	3.3
Input power measured, W	920	312.5	625	875	308	615
Thermal dissipation, BTU/hr	3,140	1,067	2,134	2,987	1,050	2,099

6250 controller module and I/O expansion module electrical requirements:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	9.3	3.3	6.6	4.5	1.65	3.3
Input power measured, W	920	312.5	625	875	308	615
Thermal dissipation, BTU/hr	3,140	1,067	2,134	2,987	1,050	2,099

6280/FAS6290 controller module and I/O expansion module electrical requirements:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	9.6	3.5	6.9	4.7	1.75	3.5
Input power measured, W	950	332.5	665	910	323	645
Thermal dissipation, BTU/hr	3,243	1,135	2,270	3,106	1,101	2,202

80xx series systems

80xx series characteristics

The following table lists the characteristics and requirements for your hardware.

Note

Electrical requirements for systems containing performance accelerator, Flash Cache, and Flash Cache 2 modules are measured with the maximum number of these modules installed in the system. The maximum power draw is 25W.

FAS8020 physical characteristics:

Weight	Single controller module	63.8 lbs (28.6 kg)
	Two controller modules	74.1 lbs (33.6 kg)
Rack units		3
Height		5.12 in. (13.0 cm)
Width		17.6 in. (44.68 cm)
Depth (including cable management tray)		24 in. (60.7 cm)

FAS8020 clearance dimensions:

Front—cooling	All versions—two-post rack and four-post rack	10 in. (25.4 cm)
Rear—cooling		12 in. (30.5 cm)
Front of chassis—maintenance		30 in. (76.2 cm)
Rear of chassis—maintenance		30 in. (76.2 cm)

FAS8040 physical characteristics:

Weight	Single controller module	101 lbs (45.8 kg)
	Two controller modules	119.5 lbs (54.2 kg)
Rack units		6
Height		10.2 in. (25.86 cm)
Width		17.6 in. (44.68 cm)

Depth (including cable management tray)	29 in. (73.66 cm)

FAS8040 clearance dimensions:

Front—cooling	All versions—two-post rack and four-post rack	6 in. (15.2 cm)
Rear—cooling		12 in. (30.5 cm)
Front of chassis—maintenance		30 in. (76.2 cm)
Rear of chassis—maintenance		36 in. (91.4 cm)

FAS8060 physical characteristics:

Weight	Single controller module	102.1 lbs (46.3 kg)
	Two controller modules	121.5 lbs (55.1 kg)
Rack units		6
Height		10.2 in. (25.86 cm)
Width		17.6 in. (44.68 cm)
Depth (including cable management tray)		29 in. (73.66 cm)

FAS8060 clearance dimensions:

Front—cooling	All versions—two-post rack and four-post rack	6 in. (15.2 cm)
Rear—cooling		12 in. (30.5 cm)
Front of chassis—maintenance		30 in. (76.2 cm)
Rear of chassis—maintenance		36 in. (91.4 cm)

Environmental requirements:

Operating temperature range	50° F to 104° F (10° C to 40° C)
Non-operating temperature range	-40° F to 158° F (-40° C to 70° C)
Relative humidity	20 to 80% noncondensing

Acoustic level—Normal operating conditions at 23° C at sea level	61.3 dBA sound pressure (LpA) 7.5 Bel sound power (LWAd)
Altitude	10,000 ft. operating 40,000 ft. nonoperating
Input power frequency, Hz (AC)	50 to 60
Input power voltage, V RMS (AC) (auto-ranging)	100-120V or 200-240V

FAS8080 physical characteristics:

Weight	119.8 lbs (54.34 kg)
Rack units	6
Height	10.2 in. (25.86 cm)
Width	17.6 in. (44.68 cm)
Depth (including cable management tray)	29 in. (73.66 cm)

FAS8080 clearance dimensions:

Front—cooling	All versions—two-post rack and four-post rack	6 in. (15.2 cm)
Rear—cooling		12 in. (30.5 cm)
Front of chassis—maintenance		30 in. (76.2 cm)
Rear of chassis—maintenance		36 in. (91.4 cm)

Environmental requirements:

Operating temperature range	50° F to 104° F (10° C to 40° C)
Non-operating temperature range	-40° F to 158° F (-40° C to 70° C)
Relative humidity	20 to 80% noncondensing
Acoustic level—Normal operating conditions at 23° C at sea level	61.3 dBA sound pressure (LpA) 7.5 Bel sound power (LWAd)

Altitude	10,000 ft. operating 40,000 ft. nonoperating
Input power frequency, Hz (AC)	50 to 60
Input power voltage, V RMS (AC) (auto-ranging)	100-120V or 200-240V

8020 single-controller module electrical requirements:

Input voltage	**100 to 120V**			**200 to 240V**		
	Worst-case, single PSU	**Typical**		**Worst-case, single PSU**	**Typical**	
		Per PSU	**System, two PSUs**		**Per PSU**	**System, two PSUs**
Input current measured, A	3.84	1.39	2.78	1.87	0.70	1.40
Input power measured, W	384	139	278	374	138	276
Thermal dissipation, BTU/hr	1,309	474	948	1,275	471	941

8020 two controller modules electrical requirements:

Input voltage	**100 to 120V**			**200 to 240V**		
	Worst-case, single PSU	**Typical**		**Worst-case, single PSU**	**Typical**	
		Per PSU	**System, two PSUs**		**Per PSU**	**System, two PSUs**
Input current measured, A	5.96	2.22	4.44	2.92	1.08	2.16
Input power measured, W	596	222	444	583	216	432
Thermal dissipation, BTU/hr	2,032	757	1,514	1,988	737	1,473

8040 single-controller module electrical requirements:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	4.42	1.68	3.35	2.17	0.88	1.67
Input power measured, W	442	168	335	434	167	334
Thermal dissipation, BTU/hr	1,507	571	1,142	1,480	570	1,139

8040 two controller modules electrical requirements:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	8.76	3.03	6.05	4.28	1.49	2.98
Input power measured, W	876	303	605	855	298	596
Thermal dissipation, BTU/hr	2,987	2.063	2,063	2,916	1,016	2.032

8060 single-controller module electrical requirements:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	5.07	2.0	4.0	2.51	1.0	1.99
Input power measured, W	507	200	400	501	199	397
Thermal dissipation, BTU/hr	1,729	682	1,364	3,434	1,282	2,564

8060 two controller modules electrical requirements:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	N/A[1]	N/A[1]	N/A[1]	5.04	1.88	3.76
Input power measured, W	N/A[1]	N/A[1]	N/A[1]	1,007	376	752
Thermal dissipation, BTU/hr	N/A[1]	N/A[1]	N/A[1]	3,434	1,282	2,564

1. A single chassis FAS8060 with two controllers only runs at high line (200V). There is no 100V data.

8080 single-controller module with I/O expansion module electrical requirements:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	9.90	3.36	6.72	4.92	1.68	3.36
Input power measured, W	981	328	655	953	323	645
Thermal dissipation, BTU/hr	3,348	1,117	2,234	3252	1,100	2,199

SA systems

About this section

This section lists tabulated descriptions of the hardware characteristics, clearance requirements, environmental requirements, and electrical requirements for SA systems.

For detailed information

For details about specific models of systems, see the following topics:

SA200 system

SA200 system characteristics

The following table lists the characteristics and requirements for your hardware.

Physical characteristics:

Weight	Full (chassis with all disk drives) Empty (chassis-only)	110 lbs (49.9 kg) 91 lbs (41.3 kg)
Rack units		4
Height		6.9 in. (17.5 cm)
Width		17.6 in. (44.7 cm)
Depth		22.5 in. (57.2 cm)

Clearance dimensions:

Front—cooling	All versions—Two-post rack and four-post rack	6 in. (15.2 cm)
Rear—cooling		12 in. (30.5 cm)
Front of chassis—maintenance		30 in. (76.2 cm)
Rear of chassis—maintenance		36 in. (91.4 cm)

Environmental requirements:

Operating temperature range	50° F to 104° F (10° C to 40° C)
Non-operating temperature range	-40° F to 140° F (-40° C to 60° C)
Relative humidity	20 to 80% noncondensing
Acoustic level—Normal operating conditions at 23° C at sea level	≤ 60 dBA sound pressure (LpA) Sound power measurement not available
Input power frequency, Hz (AC)	50 to 60

Input power voltage, V RMS (AC) (auto-ranging)	100-120V or 200-240V

Electrical requirements—one controller module:

Input voltage		**100 to 120V**			**200 to 240V**		
	Drives (in GB)	**Worst-case, single PSU**	**Typical**		**Worst-case, single PSU**	**Typical**	
			Per PSU	**System, two PSUs**		**Per PSU**	**System, two PSUs**
Input current measured, A	144 SAS	5.64	2.38	4.76	2.82	1.33	2.65
	300 SAS	6.62	2.96	5.92	3.27	1.38	2.76
	450 SAS	6.62	2.96	5.92	3.27	1.38	2.76
	250 SATA	4.40	2.02	4.04	2.30	1.04	2.07
	500 SATA	4.64	2.18	4.36	2.33	1.09	2.17
	750 SATA	5.07	2.26	4.51	2.46	1.20	2.40
	1-TB SATA	5.07	2.26	4.51	2.46	1.20	2.40
Input power measured, W	144 SAS	560	233	465	547	251	502
	300 SAS	658	292	583	636	266	523
	450 SAS	658	292	583	636	266	523
	250 SATA	435	197	393	439	193	386
	500 SATA	459	213	425	447	204	408
	750 SATA	504	220	439	474	224	447
	1-TB SATA	504	220	439	474	224	447

Thermal dissipation, BTU/hr	144 SAS	1,909	794	1,587	1,864	855	1,710
	300 SAS	2,243	994	1,988	2,165	891	1,782
	450 SAS	2,243	994	1,988	2,165	891	1,782
	250 SATA	1,482	670	1,339	1,497	659	1,317
	500 SATA	1,564	724	1,448	1,523	696	1,392
	750 SATA	1,718	749	1,497	1,617	762	1,523
	1-TB SATA	1,718	749	1,497	1,617	762	1,523

Electrical requirements—two controller modules:

Input voltage		100 to 120V			200 to 240V		
	Drives (in GB)	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	144 SAS	6.31	2.84	5.68	3.09	1.45	2.89
	300 SAS	7.51	3.34	6.68	3.73	1.71	3.41
	450 SAS	7.51	3.34	6.68	3.73	1.71	3.41
	250 SATA	5.54	2.49	4.98	2.7	1.26	2.52
	500 SATA	5.74	2.84	5.67	2.89	1.33	2.65
	750 SATA	5.91	2.74	5.47	2.97	1.39	2.77
	1 TB SATA	5.91	2.74	5.47	2.97	1.39	2.77
Input power measured, W	144 SAS	628	279	558	600	275	550
	300 SAS	747	330	659	728	328	655
	450 SAS	747	330	659	728	328	655
	250 SATA	549	244	487	518	237	474
	500 SATA	567	277	554	561	252	503
	750 SATA	585	268	536	575	262	524
	1-TB SATA	585	268	536	575	262	524

Thermal dissipation, BTU/hr	144 SAS	2,142	951	1,902	2,044	938	1,876
	300 SAS	2,547	1,124	2,247	2,483	1,116	2,232
	450 SAS	2,547	1,124	2,247	2,483	1,116	2,232
	250 SATA	1,872	831	1,662	1,767	809	1,617
	500 SATA	1,932	946	1,891	1,913	857	1,714
	750 SATA	1,996	914	1,827	1,962	893	1,785
	1-TB SATA	1,996	914	1,827	1,962	893	1,785

Electrical requirements—one controller module, no disk drives:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	2.10	0.90	1.80	1.10	0.50	0.99
Input power measured, W	205	86.5	173	198	84	168
Thermal dissipation, BTU/hr	698	295	589	675	287	574

Electrical requirements—two controller modules, no disk drives:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	2.62	1.19	2.37	1.35	0.62	1.24
Input power measured, W	256	114	227	250	111	222
Thermal dissipation, BTU/hr	874	387	773	851	379	758

SA300 system

SA300 system characteristics

The following table lists the characteristics and requirements for your hardware.

Physical characteristics:

Weight	68 lbs (30.84 kg)
Rack units	3
Height	5.13 in. (13 cm)
Width	17.73 in. (45.0 cm)
Depth	24 in. (60.7 cm)

Clearance dimensions:

Front—cooling	All versions—two-post rack and four-post rack	6 in. (15.2 cm)
Rear—cooling		12 in. (30.5 cm)
Front—maintenance		30 in. (76.2 cm)
Rear—maintenance		36 in. (91.4 cm)

Environmental requirements:

Operating temperature range	50° F to 104° F (10° C to 40° C)
Non-operating temperature range	-40° F to 149° F (-40° C to 65° C)
Relative humidity	20 to 80% noncondensing
Acoustic level—Normal operating conditions at 23° C at sea level	49 dBA sound pressure (LpA) Sound power measurement not available
Input power frequency, Hz (AC)	50 to 60
Input power voltage, V RMS (AC) (auto-ranging)	100-120V or 200-240V

SA300 electrical requirements:

Input voltage	100 to 120V			200 to 240V			-40 to -60V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	4.03	1.85	3.7	2.06	1.05	2.1	10.57	4.7	9.4
Input power measured, W	400	181	362	387	178	355	423	188	376
Thermal dissipation, BTU/hr	1,365	617	1,233	1,320	606	1,212	1,442	642	1,283

SA300 electrical requirements with two Performance Acceleration modules or Flash Cache modules:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	4.51	2.04	4.08	2.29	1.22	2.43
Input power measured, W	449	201	402	438	208	415
Thermal dissipation, BTU/hr	1,530	685	1,369	1,493	707	1,414

SA320 system

SA320 system characteristics

The following table lists the characteristics and requirements for your hardware.

Physical characteristics:

Weight—one controller module	67.3 lbs (30.5 kg)
Weight—two controller modules	79.5 lbs (36.1 kg)
Weight—controller and I/O expansion module	74.5 lbs (33.8 kg)
Rack units	3
Height	5.12 in. (13.0 cm)
Width	17.61 in. (44.7 cm)
Depth	24 in. (60.7 cm)

Clearance dimensions:

Front—cooling	All versions—two-post rack and four-post rack	10 in. (25.4 cm)
Rear—cooling		12 in. (30.5 cm)
Front—maintenance		30 in. (76.2 cm)
Rear—maintenance		30 in. (76.2 cm)

Environmental requirements:

Operating temperature range	50° F to 104° F (10° C to 40° C)
Non-operating temperature range	-40° F to 158° F (-40° C to 70° C)
Relative humidity	20 to 80% noncondensing
Acoustic level—Normal operating conditions at 23° C at sea level	55.4 dBA sound pressure (LpA) 7.1 Bel sound power (LWAd)
Altitude	10,000 ft. operating 40,000 ft. nonoperating
Input power frequency, Hz (AC)	50 to 60
Input power voltage, V RMS (AC) (auto-ranging)	100-120V or 200-240V

SA320 electrical requirements with one 256-GB, one 512-GB, or one 1-TB Flash Cache module and one I/O expansion module:

Input voltage	**100 to 120V**			**200 to 240V**			**-40 to -60V**		
Input current measured, A	5.47	2.07	4.14	2.73	1.07	2.13	13.55	5.05	10.1
Input power measured, W	547	204	408	533	199	398	542	202	404
Thermal dissipation, BTU/hr	1,867	697	1,393	1,820	680	1,359	1,850	690	1,379
Input current measured, A	5.47	2.07	4.14	2.73	1.07	2.13	13.55	5.05	10.1
Input power measured, W	547	204	408	533	199	398	542	202	404

SA600 system

SA600 system characteristics

The following table lists the characteristics and requirements for your hardware:

Physical characteristics:

Weight	122 lbs (55.34 kg)
Rack units	6
Height	10.32 in. (26.21 cm)
Width	17.53 in. (44.52 cm)
Depth (including cable management tray)	29 in. (73.66 cm)

Clearance dimensions:

Front—cooling	All versions—two-post rack and four-post rack	6 in. (15.2 cm)
Rear—cooling		12 in. (30.5 cm)
Front of chassis—maintenance		25 in. (63.5 cm)
Rear of chassis—maintenance		40 in. (102 cm)

Environmental requirements:

Operating temperature range	50° F to 104° F (10° C to 40° C)
Non-operating temperature range	-40° F to 158° F (-40° C to 70° C)
Relative humidity	20 to 80% noncondensing
Acoustic level—Normal operating conditions at 22° C at sea level	56.5 dBA sound pressure (LpA) Sound power measurement not available
Input power frequency, Hz (AC)	50 to 60

SA600 electrical requirements:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	9.72	2.8	5.6	4.84	1.45	2.9
Input power measured, W	966	274	548	928	266	532
Thermal dissipation, BTU/hr	3,293	935	1,870	3,166	908	1,816

SA600 electrical requirements with five Performance Acceleration modules or Flash Cache modules:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	12.11	3.85	7.70	5.97	2.07	4.14
Input power measured, W	1,203	376	752	1,158	368	736
Thermal dissipation, BTU/hr	4,104	1,283	2,566	3,950	1,255	2,509

SA620 system

SA620 system characteristics

The following table lists the characteristics and requirements for your hardware:

Physical characteristics:

Weight	Single controller module	99.2 lbs (45 kg)
	Controller and I/O expansion module	125.7 lbs (57 kg)
	Two controller modules	130.1 lbs (59 kg)
Rack units		6
Height		10.32 in. (26.21 cm)
Width		17.53 in. (44.52 cm)
Depth (including cable management tray)		29 in. (73.66 cm)

Clearance dimensions:

Front—cooling	All versions—two-post rack and four-post rack	6 in. (15.2 cm)
Rear—cooling		12 in. (30.5 cm)
Front of chassis—maintenance		25 in. (63.5 cm)
Rear of chassis—maintenance		40 in. (102 cm)

Environmental requirements:

Operating temperature range	50° F to 104° F (10° C to 40° C)
Non-operating temperature range	-40° F to 158° F (-40° C to 70° C)
Relative humidity	20 to 80% noncondensing
Acoustic level—Normal operating conditions at 23° C at sea level	61.3 dBA sound pressure (LpA) 7.5 Bel sound power (LWAd)

Altitude	10,000 ft. operating 40,000 ft. nonoperating
Input power frequency, Hz (AC)	50 to 60
Input power voltage, V RMS (AC) (auto-ranging)	100-120V or 200-240V

SA620 controller module and I/O expansion module electrical requirements:

Input voltage	**100 to 120V**			**200 to 240V**		
	Worst-case, single PSU	**Typical**		**Worst-case, single PSU**	**Typical**	
		Per PSU	**System, two PSUs**		**Per PSU**	**System, two PSUs**
Input current measured, A	9.6	3.5	6.9	4.7	1.75	3.5
Input power measured, W	950	332.5	665	910	323	645
Thermal dissipation, BTU/hr	3,243	1,135	2,270	3,106	1,101	2,202

NearStore systems

About this section

This section lists tabulated descriptions of the hardware characteristics, clearance requirements, environmental requirements, and electrical requirements for NearStore systems.

For detailed information

For details about specific models of NearStore systems, see “VTL appliances” on page 133.

VTL appliances

VTL appliance characteristics

The following table lists the characteristics and requirements for your hardware:

Physical characteristics:

Weight	Storage engine	75 lbs (34.019 kg)
	DS14mk2 AT	77 lbs (35 kg)
	Fully loaded in system cabinet	999 lbs (453.14 kg)
Rack units	Storage engine	3
	DS14mk2 AT	3
Height	Storage engine	5.13 in. (13 cm)
	DS14mk2 AT	5.25 in. (13.3 cm)
Width	Storage engine	17.68 in. (44.9 cm)
	DS14mk2 AT	17.6 in. (44.8 cm)
Depth	Storage engine	24.33 in. (61.8 cm)
	DS14mk2 AT	21.75 in. (55.2 cm)

Clearance dimensions:

Front	Storage engine and DS14mk2 AT	25 in. (63.5 cm)
Rear—cooling		12 in. (30.5 cm)
Bezel		1.5 in. (3.8 cm)
Rear—maintenance		40 in. (101.6 cm)
Vertical rack space		10.5 in. (26.7 cm)
Vertical rack space between storage engine and disk shelf		1.5 in. (3.8 cm)

Environmental requirements:

Operating temperature maximum range	Storage engine	50° F to 104° F (10° C to 40° C)
	DS14mk2 AT	41° F to 104° F (5° C to 40° C)
Operating temperature recommended range	Storage engine and DS14mk2 AT	68° F to 77° F (20° C to 25° C)
Non-operating temperature range	Storage engine and DS14mk2 AT	-40° F to 140° F (-40° C to 60° C)
Relative humidity	Storage engine	20 to 80% noncondensing
	DS14mk2 AT	
Acoustic level—Normal operating conditions at 23° C at sea level	Storage engine	54 dBA (LpA)
	DS14mk2 AT	58 dBA (LpA)
	Sound power measurements not available.	
Input power frequency, Hz (AC)		50 to 60
Input power voltage, V RMS (AC) (auto-ranging)		100-120V or 200-240V

VTL300/700/1400 electrical requirements:

Input voltage	100 to 120V			200 to 240V			-40 to -60V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	4.03	1.85	3.7	2.06	1.05	2.1	10.57	4.7	9.4
Input power measured, W	400	181	362	387	178	355	423	188	376
Thermal dissipation, BTU/hr	1,365	617	1,233	1,320	606	1,212	1,442	642	1,283

Disk shelves

About this section

This section lists tabulated descriptions of the hardware characteristics, clearance requirements, environmental requirements, and electrical requirements for disk shelves.

Note

NearStore VTL system disk shelf information is listed in the section "Storage systems" on page 18.

For detailed information

For details about specific models of disk shelves, see the following topics:

DS14 series disk shelves

DS14 series characteristics

The following table lists the characteristics and requirements for your hardware.

Note

The DS14 series includes the DS14, DS14mk2 FC, DS14mk4 FC with an ESH, ESH2, or ESH4 (ESH refers to ESH 2 and ESH4), and DS14mk2 AT.

Physical characteristics:

Weight	With disk drives—DS14mk2 FC, DS14mk4	77 lbs (35 kg)
	With disk drives—DS14mk2 AT	68 lbs (30.8 kg)
	Empty	50.06 lbs (23 kg)
Rack units		3
Height		5.25 in. (13.3 cm)
Width		17.6 in. (44.7 cm)
Depth	DS14mk2 FC/DS14mk4 FC	20 in. (50.8 cm)
	DS14mk2 AT	22 in. (55.2 cm)

Clearance dimensions:

Front—cooling	All versions—two-post rack and four-post rack	6 in. (15.3 cm)
Rear—cooling and maintenance		12 in. (30.5 cm)
Front—maintenance		25 in. (55.9 cm)

Environmental requirements:

Operating temperature range	41° F to 104° F—(5° C to 40° C)
Non-operating temperature range	-40° F to 140° F—(-40° C to 60° C)
Relative humidity	20 to 80% noncondensing
Acoustic level—Normal operating conditions at 23° C at sea level	58 dB sound pressure (LpA) Sound power measurement not available
Input power frequency, Hz (AC)	50 to 60
Input power voltage, V RMS (AC) (auto-ranging)	100-120V or 200-240V

DS14mk2 AT 7.2K speed, HE PSU electrical requirements:

Input voltage		100 to 120V			200 to 240V			-40 to -60V		
	Size GB	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	750	2.72	1.24	2.48	1.28	0.61	1.21			N/A
	1-TB	2.51	1.19	2.38	1.22	0.59	1.17			N/A
	2-TB	2.50	1.17	2.34	1.28	0.61	1.21	8.0	3.15	6.3
Input power measured, W	750	271	124	247	254	120	240			N/A
	1-TB	250	119	237	243	117	233			N/A
	2-TB	249	115	230	246	107	214	200	79	157
Thermal dissi-pation, BTU/hr	750	924	421	842	866	410	819			N/A
	1-TB	853	404	808	829	398	795			N/A
	2-TB	849	392	784	839	365	730	682	268	535

DS14mk2 AT 7.2K speed electrical requirements:

Input voltage		100 to 120V			200 to 240V			-40 to -60V		
	Size GB	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	250	2.79	1.36	2.72	1.38	0.70	1.39	7.38	2.84	5.67
	320	2.85	1.56	3.12	1.43	0.78	1.56	7.4	2.82	5.64
	500	2.94	1.45	2.9	1.43	0.74	1.47	8.04	3.11	6.22
	750	3.42	1.61	3.22	1.63	0.53	1.60	8.42	6.63	7.25
	1-TB	3.15	1.55	3.10	1.55	0.78	1.56	8.33	3.24	6.48
Input power measured, W	250	279	136	271	271	132	264	295	114	227
	320	284	155	310	283	152	304	296	113	226
	500	293	144	288	286	142	283	322	125	249
	750	341	161	321	323	155	309	337	145	290
	1-TB	315	154	308	309	150	300	333	130	259
Thermal dissi-pation, BTU/hr	250	953	462	923	923	450	900	1,007	387	773
	320	968	529	1,058	964	518	1,035	1,009	385	769
	500	998	492	983	975	482	964	1,097	424	848
	750	1,163	548	1,095	1,103	527	1,054	1,148	495	989
	1-TB	1,073	525	1,050	1,054	512	1,024	1,136	442	884

DS14mk2 FC 10K speed electrical requirements:

Input voltage		100 to 120V			200 to 240V			-40 to -60V		
	Size GB	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	72	3.31	1.72	3.43	1.61	0.84	1.67	7.61	3.02	6.04
	144	3.56	1.72	3.43	1.75	0.87	1.73	9.23	3.63	7.26
	288	4.0	1.95	3.89	1.96	0.95	1.9	10.54	3.73	7.45
Input power measured, W	72	330	171	342	318	162	323	305	121	242
	144	356	171	342	348	167	334	369	145	290
	288	399	194	387	420	187	374	422	149	298
Thermal dissi-pation, BTU/hr	72	1,125	584	1,167	1,084	552	1,103	1,039	413	825
	144	1,215	584	1,167	1,185	570	1,140	1,259	495	990
	288	1,362	660	1,320	1,433	638	1,275	1,437	508	1,016

DS14mk2 FC 15K speed electrical requirements:

Input voltage		100 to 120V			200 to 240V			-40 to -60V		
	Size GB	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	72	3.41	1.82	3.63	1.67	0.89	1.78	10.04	3.98	7.95
	144	3.96	1.88	3.75	1.93	0.94	1.88	10.40	4.13	8.25
	288	4.43	2.16	4.32	2.23	1.07	2.13	11.98	4.36	8.72
	450	4.43	2.16	4.32	2.23	1.07	2.13			N/A
Input power measured, W	72	340	181	362	331	173	345	402	159	318
	144	395	187	373	383	183	365	416	165	330
	288	443	216	431	443	208	415	479	175	349
	450	443	216	431	443	208	415			N/A
Thermal dissi-pation, BTU/hr	72	1,159	617	1,234	1,129	589	1,178	1,370	543	1,085
	144	1,347	636	1,272	1,245	653	1,305	1,418	563	1,125
	288	1,512	735	1,470	1,512	707	1,414	1,634	595	1,190
	450	1,512	735	1,470	1,512	707	1,414			N/A

DS14mk4 FC 10K speed electrical requirements:

Input voltage		100 to 120V			200 to 240V			-40 to -60V		
	Size GB	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	72	2.81	1.51	3.01	1.38	0.76	1.51	7.57	2.94	5.87
	144	3.44	1.68	3.36	1.68	0.83	1.66	9.11	3.62	7.23
	288	3.89	1.89	3.78	1.90	0.94	1.87	10.24	4.04	8.07
Input power measured, W	72	279	150	299	272	145	290	303	118	235
	144	344	167	334	333	161	321	364	145	289
	288	388	189	377	376	182	364	410	162	323
Thermal dissi-pation, BTU/hr	72	953	510	1,020	926	495	990	1,032	401	801
	144	1,174	570	1,140	1,137	548	1,095	1,242	493	986
	288	1,324	644	1,287	1,283	621	1,242	1,397	551	1,101

DS14mk4 FC 15K speed electrical requirements:

Input voltage		100 to 120V			200 to 240V			-40 to -60V		
	Size GB	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	72	3.42	1.83	3.65	1.66	0.91	1.82	10.22	4.1	8.2
	144	3.54	1.73	3.45	1.73	0.87	1.73	9.49	3.77	7.54
	288	4.52	2.14	4.27	2.23	1.06	2.12	11.73	4.81	9.61
	450	4.52	2.14	4.27	2.23	1.06	2.12			N/A
Input power measured, W	72	342	182	363	329	177	353	409	164	328
	144	354	172	344	343	167	334	380	151	301
	288	451	213	426	443	207	414	469	193	385
	450	451	213	426	443	207	414			N/A
Thermal dissi-pation, BTU/hr	72	1,167	619	1,238	1,122	602	1,204	1,394	559	1,118
	144	1,208	587	1,174	1,170	570	1,140	1,295	514	1,028
	288	1,538	726	1,452	1,512	705	1,410	1,599	656	1,311
	450	1,538	726	1,452	1,512	705	1,410			N/A

DS14mk4 FC 15K speed, HE PSU electrical requirements:

Input voltage		100 to 120V			200 to 240V			-40 to -60V		
	Size GB	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	144	2.82	1.33	2.66	1.36	0.65	1.30			N/A
	288	3.39	1.65	3.29	1.75	0.81	1.61			N/A
	450	3.59	1.65	3.29	1.75	0.81	1.61			N/A
	600	3.44	1.62	3.24	1.70	0.84	1.68	11.4	4.65	9.3
Input power measured, W	144	281	133	265	270	130	259			N/A
	288	358	164	328	349	161	321			N/A
	450	358	164	328	349	161	321			N/A
	600	342	161	321	332	158	316	285	116	232
Thermal dissi-pation, BTU/hr	144	959	452	904	921	442	883			N/A
	288	1,221	560	1,119	1,191	548	1,095			N/A
	450	1,221	560	1,119	1,191	548	1,095			N/A
	600	1,166	547	1,094	1,132	539	1,077	971	396	791

DS2246 series disk shelves

DS2246 series characteristics

The following table lists the characteristics and requirements for your hardware:

Physical characteristics:

Weight	With disk drives	56 lbs (25.4 kg)
	Without disk drives	34 34.6 lbs (15.7 kg)
	Empty	17.4 lbs (7.9 kg)
Rack units		2
Height		3.34 in. (8.49 cm)
Width (without mount flanges)		17.61 in. (44.72 cm)
Depth (no cable management arms)		19.06 in. (48.4 cm)

Clearance dimensions:

Front—cooling	All versions—two-post rack and four-post rack	6 in. (15.3 cm)
Rear—cooling and maintenance		12 in. (30.5 cm)
Front—maintenance		25 in. (55.9 cm)

Environmental requirements:

Operating temperature range		50° F to 104° F (10° C to 40° C)
Non-operating temperature range		-40° F to 158° F (-40° C to 70° C)
Relative humidity	operating	20 to 80% noncondensing
	non-operating	10 to 95% noncondensing

Altitude	operating	0 to 10,000 ft (0 to 3,045 m)
	non-operating	-1,000 to 40,000 ft (-305 to 12,192 m)
Input power frequency, Hz (AC)		50 to 60
Acoustic	SAS drives	Sound pressure measurement not available 6.2 Bel (LWAd) (2 PCMs)
Input power voltage, V RMS (AC) (auto-ranging)		100-120V or 200-240V

Electrical requirements—SAS drives:

Input voltage		**100 to 120V**			**200 to 240V (200V actual)**		
	Size (GB)	**Worst-case, single PSU**	**Typical**		**Worst-case, single PSU**	**Typical**	
			Per PSU	**System, two PSUs**		**Per PSU**	**System, two PSUs**
Input current measured, A	450	4.28	1.38	2.76	2.29	0.79	1.58
	600	4.22	1.39	2.77	2.29	0.82	1.64
	900	4.22	1.39	2.77	2.29	0.82	1.64
	1.2-TB	3.55	1.43	2.85	1.80	0.73	1.46
Input power measured, W	450	428	137	274	420	135	270
	600	422	134	267	418	133	266
	900	422	134	267	418	133	266
	1.2-TB	354	142	283	348	138	276

Thermal dissipation, BTU/hr	450	1,461	468	936	1,434	461	922
	600	1,441	456	912	1,427	454	908
	900	1,441	456	912	1,427	454	908
	1.2-TB	1,209	483	966	1,188	741	942

Electrical requirements—200-GB SSD drives:

Input voltage		**100 to 120V**			**200 to 240V (200V actual)**		
	Qty. in disk shelf	**Worst-case, single PSU**	**Typical**		**Worst-case, single PSU**	**Typical**	
			Per PSU	**System, two PSUs**		**Per PSU**	**System, two PSUs**
Input current measured, A	4	2.53	0.36	0.72	1.26	0.28	0.55
	24	3.41	0.8	1.6	1.67	0.45	0.9
Input power measured, W	4	256	35	69	251	35	70
	24	343	81	161	336	81	162
Thermal dissipation, BTU/hr	4	874	118	236	857	120	239
	24	1,171	275	550	1,147	277	553

Electrical requirements—400 GB SSD drives:

Input voltage		100 to 120V			200 to 240V (200V actual)		
	Qty. in disk shelf	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	4	1.61	.42	.83	.91	.31	.61
	4 + 20 1.2 TB	3.44	1.46	2.92	1.72	.72	1.43
	12	1.97	.60	1.19	1.07	.38	.75
	24	2.4	,88	1.75	1.29	.49	.97
Input power measured, W	4	159	40	79	155	39	77
	4 + 20 1.2 TB	334	139	277	329	135	269
	12	199	57	114	192	58	115
	24	240	87	174	236	84	167
Thermal dis-sipation, BTU/hr	4	543	135	270	529	132	263
	4 + 20 1.2 TB	1139	473	945	1122	459	918
	12	679	195	389	655	197	393
	24	819	297	594	805	285	570

Electrical requirements—800-GB encrypted and unencrypted SSD drives:

Input voltage		100 to 120V			200 to 240V (200V actual)		
	Qty. in disk shelf	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	24	3.54	1.4	2.80	1.75	0.72	1.43
Input current measured, W	24	354	141	281	344	138	276
Thermal dissipation, BTU/hr	24	1,209	480	960	1,175	471	942

Electrical requirements—1.6-TB SSD drives:

Input voltage		100 to 120V			200 to 240V (200V actual)		
	Qty. in disk shelf	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	24	2.34	.82	1.63	1.3	.47	.93
Input current measured, W	24	230	81	161	224	80	159
Thermal dissipation, BTU/hr	24	786	275	550	766	272	543

DS4243 series disk shelves

DS4243 series characteristics

The following table lists the characteristics and requirements for your hardware:

Physical characteristics:

Weight	With disk drives	110 lbs (49.9 kg)
	Without disk drives	53.7 lbs (24.4kg)
	Empty	21.1 lbs (9.6 kg)
Rack units		4
Height		7 in. (17.8 cm)
Width (without mount flanges)		17.7 in. (45 cm)
Depth		24 in. (61 cm)

Clearance dimensions:

Front—cooling	All versions—two-post rack and four-post rack	6 in. (15.3 cm)
Rear—cooling and maintenance		12 in. (30.5 cm)
Front—maintenance		25 in. (55.9 cm)

Environmental requirements:

Operating temperature range		50° F to 104° F (10° C to 40° C)
Non-operating temperature range		-40° F to 158° F (-40° C to 70° C)
Relative humidity	operating	20 to 80% noncondensing
	non-operating	10 to 95% noncondensing
Altitude	operating	0 to 10,000 ft (0 to 3,045 m)
	non-operating	-1,000 to 40,000 ft (-305 to 12,192 m)

Input power frequency, Hz (AC)		50 to 60
Acoustic	SATA drives	Sound pressure measurement not available 6.7 Bel (LWAd) (2 PCMs)
	SAS drives	dBA measurement not available 7.0 Bel (LWAd) (4 PCMs)
Input power voltage, V RMS (AC) (auto-ranging)		100-120V or 200-240V

Electrical requirements—SAS drives:

Input voltage		**100 to 120V**			**200 to 240V (200V actual)**			**200 to 240V (215V actual)**		
	Size (GB)	**Worst-case, two PSUs**	**Typical**		**Worst-case, two PSUs**	**Typical**		**Worst-case, two PSUs**	**Typical**	
			Per PSU pair	**Sys., four PSUs**		**Per PSU pair**	**Sys., four PSUs**		**Per PSU pair**	**Sys., four PSUs**
Total input current measured, A	300	5.5	3.0	6.0	2.8	1.5	3.0	2.6	1.4	2.8
	450	6.00	3.15	6.30	3.00	1.60	3.20	2.80	1.50	3.00
	600	5.98	2.86	5.71	2.99	1.44	2.87			N/A
Total input power measured, W	300	550	300	600	560	300	600	559	301	602
	450	600	315	630	600	320	640	602	323	645
	600	595	284	567	584	274	547			N/A
Total thermal dis-sipation, BTU/hr	300	1,877	1,024	2,048	1,911	1,024	2,048	1,908	1,027	2,055
	450	2,047	1,075	2,150	2,047	1,092	2,184	2,054	1,101	2,201
	600	2,028	917	1,833	1,991	933	1,865			N/A

Electrical requirements—SATA drives:

Input voltage		100 to 120V			200 to 240V (200V actual)			200 to 240V (215V actual)		
	Size (GB)	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	Sys., two PSUs		Per PSU	Sys., two PSUs		Per PSU	Sys., two PSUs
Input current measured, A	500	4.30	2.20	4.40	2.10	1.10	2.20	1.90	1.05	2.10
	1-TB	4.41	2.21	4.42	2.21	1.14	2.27	1.90	1.05	2.10
	2-TB	4.72	2.31	4.62	2.42	1.21	2.42			N/A
	3-TB	4.95	2.30	4.60	2.43	1.19	2.38			
	100-SSD	1.96	0.82	1.63	1.0	0.45	0.9	0.95	0.42	0.84
	100-SSD2	2.38	1.18	2.36	1.38	0.69	1.37			N/A
Input power measured, W	500	430	220	440	420	220	440	409	226	452
	1-TB	439	219	438	429	212	424	409	226	452
	2-TB	469	229	458	470	228	456			N/A
	3-TB	495	228	456	476	224	448			
	100-SSD	196	82	163	200	90	180	205	90	180
	100-SSD2	234	116	232	230	114	228			N/A

Thermal dis-sipation, BTU/hr	500	1,467	751	1,501	1,433	751	1,501	1,395	771	1,542
	1-TB	1,499	748	1,495	1,465	724	1,448	1,395	771	1,542
	2-TB	1,599	781	1,561	1,602	777	1,554	N/A		
	3-TB	1,688	518	1,555	1,624	764	1,528			
	100-GB SSD	669	279	557	683	308	615	700	308	615
	100-GB SSD2	799	396	792	784	390	779	N/A		

Electrical requirements—SATA drives, 6 100-GB or 12 100-GB disk drives:

Input voltage		**100 to 120V**			**200 to 240V (200V actual)**		
			Typical			**Typical**	
	Qty.	**Worst-case, single PSU**	**Per PSU**	**Sys., two PSUs**	**Worst-case, single PSU**	**Per PSU**	**Sys., two PSUs**
Input current measured, A	6	2.13	1.07	2.13	1.36	0.68	1.35
	12	2.32	1.16	2.32	1.28	0.64	1.27
Input power measured, W	6	208	104	208	204	102	204
	12	227	114	227	224	112	223
Thermal dis-sipation, BTU/hr	6	710	355	710	697	349	697
	12	775	388	775	765	381	762

Electrical requirements—SATA drives, 6 100-GB SSD drives with 18 1-TB or 18 3-TB disk drives:

Input voltage		100 to 120V			200 to 240V (200V actual)		
	Size (GB)	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	Sys., two PSUs		Per PSU	Sys., two PSUs
Input current measured, A	1-TB	3.91	1.7	3.41	2.11	0.9	1.84
	3-TB	4.11	1.9	3.72	2.25	1.1	2.14
Input power measured, W	1-TB	386	168	335	388	166	331
	3-TB	406	123	368	418	199	397
Thermal dis-sipation, BTU/hr	1-TB	1,318	572	1,144	1,325	565	1,130
	3-TB	1,386	627	1,256	1,427	678	1,355

DS4246 series disk shelves

DS4246 series characteristics

The following table lists the characteristics and requirements for your hardware:

Physical characteristics:

Weight	With disk drives	110 lbs (49.9 kg)
	Without disk drives	53.7 lbs (24.4kg)
	Empty	21.1 lbs (9.6 kg)
Rack units		4
Height		7 in. (17.8 cm)
Width (without mount flanges)		17.7 in. (45 cm)
Depth		24 in. (61 cm)

Clearance dimensions:

Front—cooling	All versions—two-post rack and four-post rack	6 in. (15.3 cm)
Rear—cooling and maintenance		12 in. (30.5 cm)
Front—maintenance		25 in. (55.9 cm)

Environmental requirements:

Operating temperature range		50° F to 104° F (10° C to 40° C)
Non-operating temperature range		-40° F to 158° F (-40° C to 70° C)
Relative humidity	operating	20 to 80% noncondensing
	non-operating	10 to 95% noncondensing
Altitude	operating	0 to 10,000 ft (0 to 3,045 m)
	non-operating	-1,000 to 40,000 ft (-305 to 12,192 m)

Input power frequency, Hz (AC)		50 to 60
Acoustic	SATA drives	Sound pressure measurement not available 6.7 Bel (LWAd) (2 PCMs)
	SAS drives	dBA measurement not available 7.0 Bel (LWAd) (4 PCMs)
Input power voltage, V RMS (AC) (auto-ranging)		100-120V or 200-240V

Electrical requirements—SATA drives:

Input voltage		100 to 120V			200 to 240V (200V actual)			200 to 240V (215V actual)		
	Size (GB)	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	Sys., two PSUs		Per PSU	Sys., two PSUs		Per PSU	Sys., two PSUs
Input current measured, A	900	3.3	1.40	2.79	1.7	0.7	1.4			N/A
	6x100	2.13	1.07	2.13	1.28	0.64	1.27			
	1-TB	4.41	2.21	4.42	2.21	1.14	2.27	1.90	1.05	2.10
	2-TB	4.72	2.31	4.62	2.42	1.21	2.42			N/A
	3-TB	4.95	2.30	4.60	2.43	1.19	2.38			
Input power measured, W	900	330	139	277	317	133	265			
	6x100	208	104	208	204	102	204			
	1-TB	439	219	438	429	212	424	409	226	452
	2-TB	469	229	458	470	228	456			N/A
	3-TB	495	228	456	476	224	448			
Thermal dis-sipation, BTU/hr	900	1,127	473	946	1,082	453	905			
	6x100	710	355	710	607	349	697			
	1-TB	1,499	748	1,495	1,465	724	1,448	1,395	771	1,542
	2-TB	1,599	781	1,561	1,602	777	1,554			N/A
	3-TB	1,688	518	1,555	1,624	764	1,528			

Electrical requirements—SATA drives, 6-100GB SSD drives with 18 1-TB or 18 3-TB disk drives:

Input voltage		100 to 120V			200 to 240V (200V actual)		
	Size (GB)	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	Sys., two PSUs		Per PSU	Sys., two PSUs
Input current measured, A	1-TB	3.91	1.7	3.41	2.11	0.9	1.84
	3-TB	4.11	1.9	3.72	2.25	1.1	2.14
Input power measured, W	1-TB	386	168	335	388	166	331
	3-TB	406	123	368	418	199	397
Thermal dissipation, BTU/hr	1-TB	1,318	572	1,144	1,325	565	1,130
	3-TB	1,386	627	1,256	1,427	678	1,355

Electrical requirements—4-TB encrypted and unencrypted SAS disk drives:

Input voltage	100 to 120V			200 to 240V (200V actual)		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	Sys., two PSUs		Per PSU	Sys., two PSUs
Input current measured, A	5.16	2.31	4.61	2.61	1.17	2.34
Input power measured, W	512	231	461	496	222	443
Thermal dissipation, BTU/hr	1,748	787	1,574	1,693	752	1,512

Electrical requirements—400-GB SSD drives:

Input voltage		100 to 120V			200 to 240V (200V actual)		
	Qty. in disk shelf	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	4x400 SSD + 20x2-TB	3.50	1.60	3.20	1.67	0.81	1.61
	24x 400 SSD	1.88	0.91	1.81	1.02	0.50	1.00
Input current measured, W	4x400 SSD + 20x2-TB	353	158	315	312	151	302
	24x 400 SSD	185	90	179	183	89	178
Thermal dissipation, BTU/hr	4x400 SSD + 20x2-TB	1024	538	1075	1064	515	1030
	24x 400 SSD	631	306	611	625	304	607

DS4486 series disk shelves

DS4486 series characteristics

The following table lists the characteristics and requirements for your hardware:

Physical characteristics:

Weight	With disk drives	150 lbs (68 kg)
	With four carriers, IOMs, and PSUs	82 lbs (37 kg)
Rack units		4
Height		6.87 in (17.44 cm)
Width		17.6 in (44.7 cm)
Depth from mounting flange to rear chassis bulkhead		27 in (68.6 cm)

Clearance dimensions:

Front—cooling	All versions—four-post rack	6 in. (15.3 cm)
Rear—cooling and maintenance		12 in. (30.5 cm)
Front—maintenance		36 in. (91.4 cm)

Environmental requirements:

Operating temperature range		50° F to 104° F (10° C to 40° C)
Non-operating temperature range		-40° F to 158° F (-40° C to 70° C)
Relative humidity	operating	20 to 80% noncondensing
	non-operating	10 to 95% noncondensing
Altitude	operating	0 to 10,000 ft (0 to 3,045 m)
	non-operating	-1,000 to 40,000 ft (-305 to 12,192 m)
Input power frequency, Hz (AC)		50 to 60
Acoustic—Normal operating conditions at 22° C at sea level		49 dB (LpA) 6.2 Bel (LWAd)
Input power voltage, V RMS (AC) (auto-ranging)		100-120V or 200-240V

Electrical requirements:

Input voltage		100 to 240V (100V actual)			200 to 240V (200V actual)		
	Size (GB)	Worst-case, two PSUs	Typical		Worst-case, two PSUs	Typical	
			Per PSU pair	Sys., four PSUs		Per PSU pair	Sys., four PSUs
Total input current measured, A	3-TB	8.71	3.29	6.57	4.59	1.73	3.46
	4-TB SATA	8.54	3.40	6.79	4.25	1.69	3.38
Total input power measured, W	3-TB	870	329	657	919	346	692
	4-TB SATA	853	339	677	837	329	657
Total thermal dissipation, BTU/hr	3-TB	2,970	1,122	2,243	3,137	1,181	2,362
	4-TB SATA	2,909	1,155	2,309	2,854	1,120	2,240

System cabinets

About this section

This section lists tabulated descriptions of the hardware characteristics, clearance requirements, environmental requirements, and electrical requirements for NetApp System Cabinets.

For detailed information

The following sections describe the system cabinet characteristics.

- "42U system cabinet characteristics" on page 165.
- "42U system cabinet, deep characteristics" on page 166

For details about the supported PDUs, see the following section.

- "Electrical requirements—all system cabinets" on page 168

42U cabinets

42U system cabinet characteristics

The following table lists the characteristics and requirements for the 42U system cabinet:

Note

The system cabinet uses passive air flow for cooling.

Physical characteristics:

Weight	Loaded	Up to 1,500 lbs (Up to 680 kg)
	Empty (no rails installed)	287 lbs (130.2 kg)
PDU weight	20A PDU x 4 PDU per cabinet	7.8 lbs (3.54 kg) per PDU
	30A PDU—single-Phase x 2 PDU per cabinet	13.4 lbs (6.08 kg) per PDU
	30A PDU—single-Phase x 4 PDU per cabinet	7.8 lbs (3.54 kg) per PDU
	3-Phase 30A PDU x 2 PDU per cabinet	17.0 lbs (7.7 kg) per PDU (IEC) 16.7 lbs (7.6 kg) per PDU (NEMA)
Height	Cabinet	78.7 in. (200 cm)
	Crate	85.8 in. (218 cm)
Width	Cabinet	23.6 in. (60 cm)
	Crate	29.8 in. (75.7 cm)
Depth	Cabinet	37.4 in. (95 cm)
	Crate	48 in. (121.9 cm)

Clearance dimensions:

Front	30 in. (76.3 cm)
Rear	30 in. (76.3 cm)
Top	12 in. (30 cm)

Environmental requirements:

Operating temperature maximum range -	32° F to 104° F (0° C to 40° C)
Operating temperature recommended range	68° F to 77° F (20° C to 25° C)
Non-operating temperature range	-40° F to 149° F (-40° C to 65° C)
Relative humidity	10 to 90% noncondensing

42U system cabinet, deep characteristics

The following table lists the characteristics and requirements for the 42U system cabinet, deep:

Note

The system cabinet uses passive air flow for cooling.

Physical characteristics:

Weight	Loaded with system cabinet—ship weight	Up to 1,807 lbs (820 kg)
	Loaded with system cabinet—static weight	Up to 2,307 lbs (1,046 kg)
	Empty	307 lbs (138 kg)

PDU weight	20A PDU x 4 PDU per cabinet	7.8 lbs (3.54 kg) per PDU
	30A PDU—single-Phase x 2 PDU per cabinet	13.4 lbs (6.08 kg) per PDU
	30A PDU—single-Phase x 4 PDU per cabinet	7.8 lbs (3.54 kg) per PDU
	3-Phase 30A PDU x 2 PDU per cabinet	17.0 lbs (7.7 kg) per PDU (IEC) 16.7 lbs (7.6 kg) per PDU (NEMA)
Height	Cabinet	78.7 in. (200 cm)
	Crate	85.8 in. (218 cm)
Width	Cabinet	23.6 in. (60 cm)
	Crate	29.8 in. (75.7 cm)
Depth	Cabinet	44.3 in. (112.5 cm)
	Crate	51 in. (129.5 cm)

Clearance dimensions:

Front	30 in. (76.3 cm)
Rear—recommended **Note** The rear door is split. Actual minimum rear clearance is approximately 1/2 the recommendation.	30 in. (76.3 cm)
Top	12 in. (30 cm)

Environmental requirements:

Operating temperature maximum range	32° F to 104° F (0° C to 40° C)
Operating temperature recommended range	68° F to 77° F (20° C to 25° C)

Non-operating temperature range	-40° F to 149° F (-40° C to 65° C)
Relative humidity	10 to 90% noncondensing

Unpacking space requirements

The following table lists the floor space needed to unpack the system cabinet from the shipping crate:

Shipping crate ramp length	80 in. (203.2 cm)
Clearance beyond the ramp for cabinet mobility	72 in. (182.9 cm)
Rear clearance to remove the crate shell	51 in. (129.5 cm)
Shipping crate height	80 in. (203.2 cm)
Shipping crate width	30 in. (76.2 cm)
Shipping crate pallet depth	57 in. (144.8 cm)
Shipping pallet width	42 in. (106.6 cm)
Shipping pallet and crate height	86 in. (218.4 cm)

Electrical requirements—all system cabinets

The system cabinets can have one of the PDU configurations listed in the following table:

PDU desc.	NetApp part #	Packing list desc.	PDU current capacity in amps—per side (redundant power capacity	Approx. max. available power per cabinet (current limit x line voltage)	BTU/hr. (worst-case)	Per system cabinet side	
						Outlets per side—C13	# of power cords
Single-phase 20A with NEMA power cords	X8711-R6	PDU, 1-Phase, 8 Outlet, 20A, Universal, R6	32	6.7 kW @ 208V	22,717	16	2 per side, detachable input cord; PDU limited to 16A
Single-phase 20A with IEC or Australia power cords			32	7.4 kW @ 230V	25,120		
Single-phase 30A NEMA	X8712-R6	PDU, 1-Phase, 16 Outlet, 30A, NEMA, R6	24	5.0 kW @ 208V	17,038	16	1 per side; tethered units
Single-phase 30A NEMA	X8712B-R6	PDU, 1-Phase, 8 Outlet, 30A, NEMA, R6	48	10.0 kW @ 208V	34,075	16	2 per side; 4 plugs per system cabinet

PDU desc.	NetApp part #	Packing list desc.	PDU current capacity in amps—per side (redundant power capacity	Approx. max. available power per cabinet (current limit x line voltage)	BTU/hr. (worst-case)	Per system cabinet side	
						Outlets per side—C13	# of power cords
Single-phase 30A NEMA	X8712C-R6	PDU, 1-Phase, 12 Outlet, 30A, NEMA, R6	48	10.0 kW @ 208V	34,075	24	2 per side; 4 plugs per system cabinet
Single-phase 32A IEC	X8713-R6	PDU, 1-Phase, 16 Outlet, 30A, IEC, R6	30	6.9 kW @ 230V	23,550	16	1 per side; tethered; limited to 30A by 2x 15A breakers
Single-phase 32A IEC	X8713B-R6	PDU, 1-Phase, 8 Outlet, 30A, IEC, R6	48	11.0 kW @ 230V	37,680	16	2 per side; 4 plugs per cabinet; limited to 24A input/PDU
Single-phase 32A IEC	X8713C-R6	PDU, 1-Phase, 12 Outlet, 30A, IEC, R6	64	14.7 kW @ 230V	50,239	24	2 per side

PDU desc.	NetApp part #	Packing list desc.	PDU current capacity in amps—per side (redundant power capacity	Approx. max. available power per cabinet (current limit x line voltage)	BTU/hr. (worst-case)	Per system cabinet side	
						Outlets per side—C13	# of power cords
3-phase 30A Delta	X8719A-R6	PDU, 3-phase, 24-Outlet, 30A, NEMA, 4-Pin, R6	41.5	8.6 kW @ 208V	29,461	24	1 per side L15-30
	X8720A-R6	PDU, 3-phase, 24-Outlet, 30A, NEMA, 5-Pin, R6					1 per side L21-30
3-phase 32A Wye	X8718A-R6	PDU, 3-phase, 24-Outlet, 32A, IEC, R6	96	22.1 kW @ 230V	75,359	24	1 per side

Note

All PDUs have 200 to 240V input voltage and input frequency of 50/60 Hz.

Note

For complete power redundancy, each PDU must be connected to a dedicated circuit. See “Balancing the load across PDUs” on page 10 for PDU and PSU connection examples.

Switches

About this section

This section lists tabulated descriptions of the hardware characteristics, clearance requirements, environmental requirements, and electrical requirements for switches.

For detailed information

For details about specific models of switches, see the following topics:

- “CN series switches” on page 173
- “Third-party switches” on page 175

CN1601 Ethernet switch characteristics

The following table lists the characteristics and requirements for your hardware:.

Physical characteristics:

Weight	12 lbs (5.45 kg)
Rack units	1
Height	1.69 in (4.3 cm)
Width	17.5 in (44.5 cm)
Depth	20 in (50.8 cm)

Environmental requirements:

Operating temperature range		50° F to 104° F (10° C to 40° C)
Non-operating temperature range		-40° F to 158° F (-40° C to 70° C)
Relative humidity	operating	20 to 80% noncondensing
	non-operating	10 to 95% noncondensing
Input power frequency, Hz (AC)		50 to 60

Electrical requirements:

Input voltage	**100 to 240V (100V actual)**		**200 to 240V (200V actual)**	
	Worst-case	**Typical**	**Worst-case**	**Typical**
Total input current measured, A	0.58	0.58	0.37	0.37
Total input power measured, W	33	33	33	33
Total thermal dissipation, BTU/hr	113	113	113	113

CN1610 Ethernet switch characteristics

The following table lists the characteristics and requirements for your hardware.

Physical characteristics:

Weight	25 lbs (10.2 kg)
Rack units	1
Height	1.69 in (4.3 cm)
Width	17.5 in (44.5 cm)
Depth	20 in (50.8 cm)

Environmental requirements:

Operating temperature range		50° F to 104° F (10° C to 40° C)
Non-operating temperature range		-40° F to 158° F (-40° C to 70° C)
Relative humidity	operating	20 to 80% noncondensing
	non-operating	10 to 95% noncondensing
Input power frequency, Hz (AC)		50 to 60

Electrical requirements:

Input voltage	**100 to 240V (100V actual)**		**200 to 240V (200V actual)**	
	Worst-case	**Typical**	**Worst-case**	**Typical**
Total input current measured, A	1.28	1.43	0.82	0.97
Total input power measured, W	118	128	118	129
Total thermal dissipation, BTU/hr	403	437	403	441

Third-party switches

Where to find information about your switches

See your switch documentation for height, dimensions, weight, clearance, environmental, and electrical requirements.

Feature Update Record A

Feature update history

The following table lists and describes the history of changes made to this manual. When a change is implemented, it applies to the release in which it was implemented and all subsequent releases, unless otherwise specified.

Feature updates	Feature first implemented in	Documentation revision for feature date
Added specifications for ESH4 and DS14mk4 FC disk shelves.	Data ONTAP 6.4.4 or higher and Data ONTAP 6.5.1 or higher	April 2007
Revised power figures for FAS250, FAS270, FAS3000 series systems, and FAS60xx series systems. Removed legacy equipment. Implementation of Feature Update Record (this chapter).	Data ONTAP 7.2.1 or higher	
Added FAS2020 and FAS2050 information	Data ONTAP 7.2.2L1	June 2007
Added diskless FAS2050 information. Added RJ-45 to DB-9 console port adapter and ASCII terminal pinout tables.		September 2007
Added FAS6040 and FAS6080 information. Added information to DS14 disk shelf section for different drive capacities.	Data ONTAP 7.2.4	December 2007
Added diskless FAS2050 single controller module power requirements.	Data ONTAP 7.2.4 or higher	January 2008
Modified PDU information for 42U System Cabinet.		March 2008

Feature updates	Feature first implemented in	Documentation revision for feature date
Added SA systems information. Added power information for PDUs deployed in Europe.	Data ONTAP 7.2.5 or higher and Data ONTAP 7.3 or higher	May 2008
Added FAS31xx and V31xx series system information.		June 2008
Added Performance Acceleration Module I information Removed Inrush data from all platform and disk shelf tables		
Added FAS3160 information.	Data ONTAP 7.2.6	November 2008
Added DC power figures to FAS31xx series systems	N/A	May 2009
Add DS4243 information Add Performance Acceleration Module II (Flash Cache) information	Data ONTAP 7.3.2 Data ONTAP 8.0	August 2009
Modified DS4243 table heading for SAS drives Added PDU load balancing illustrations Updated 30A, 12-outlet PDU information		October 2009
Added HE PSU electrical information Corrected DS4243 environmental data	N/A	March 2010
Added DS2246, FAS32xx, and 42U System Cabinet, Deep information	Data ONTAP 8.0.1	September 2010
Added FAS2020 600 GB and 2-TB disk electrical information Added FAS62xx data	Data ONTAP 8.0.1	November 2010
Corrected FAS32xx power data. Removed FAS/V prefixes to all systems from 30xx onward.	Data ONTAP 8.0.1	February 2011

Feature updates	Feature first implemented in	Documentation revision for feature date
Updated DS2246 electrical information Added 1TB FlashCache information	Data ONTAP 8.0.1	May 2011
Added 3TB Disk information for DS4243 disk shelf Updated Acoustic information for FAS20xx, FAS30xx, FAS3100, FAS32xx, FAS60xx, FAS62xx, DS14, SA2246, and DS4243		July 2011
Added ATTO FibreBridge 6500N information	Data ONTAP 8.1	September 2011
Added 2240-2 information	Data ONTAP 8.1	September 2011
Added 2240-4 information Added 450-GB and 650-GB drive information to 2240-x section	Data ONTAP 8.1	November 2011
Added 2220 information Added DS4486 information Added updated and added new information to 2240-4 section	Data ONTAP 8.1.1	June 2012
FAS3220 and FAS3250 Added additional information to DS4246 section	Data ONTAP 8.1.2	November 2012
Updated FAS2220 physical characteristics Added 200 GB SSD information to DS2246 Added 4TB information to DS4486		January 2013
Added FAS6220 and FSAS6280 data		February 2013

Feature updates	Feature first implemented in	Documentation revision for feature date
Added 200GB SSD information for the FAS2220, FAS2240-2 and FAS2240-4. Added 800GB disk drive information for the FAS2220, FAS2240-2, and DS2246 disk shelves. Added information for 200-GB SSD for DS2246 disk shelf. Added 4-TB disk drive information for DS4246 disk shelves. Added 1.2-TB disk drive information for FAS2240-2 and DS2246 disk shelves.	Data ONTAP 8.1.2	April/May 2013
Added 900-GB disk drive information to FAS2220, FAS2240-2, and DS2246 disk shelves. Added 4-TB disk drive information to FAS2220 and FAS2240-4. Added 1.2-TB SAS disk drive information to FAS2220 for 12 drives and FAS2240-2 for 24 drives.		July 2013
Added note for Flash Cache 2 requirements to FAS32xx and 62xx sections, and added notes to 30xx, 31xx, and 60xx sections stating there is no Flash Cache 2 support for these systems.		August 2013
Added 400-GB SSD information to FAS2220 and FAS2240-2. Added 1.6-TD SSD information to FAS2220 and FAS2240-2. Add 800-GB SSD NSE data to DS2246. Added 400-GB SSD/1.2-TB HDD information to DS2246 and FAS2240-2. Added 400-GB SSD/4-TB HDD dast to DS4246. Added 80xx series data.		January 2014
Added FAS2820/840/8060 information	Data ONTAP 8.2.1	February 2014
Added FAS25xx information	8.2.2	May 2014
Added FAS8080 information and corrections for BURT 830023, added 4-TB disk information to FAS2554.	8.2.2	June 2014

Feature updates	Feature first implemented in	Documentation revision for feature date
Revised FAS2500 data, added additional FAS2500 configurations, updated FAS8020/8040/8060 data, removed residual FAS900 informaion.	8.2.2	August 2014
Revised FAS2500 data; new measurements added, removed FAS3000 data (end of HW support in April 2014)		September 2014

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