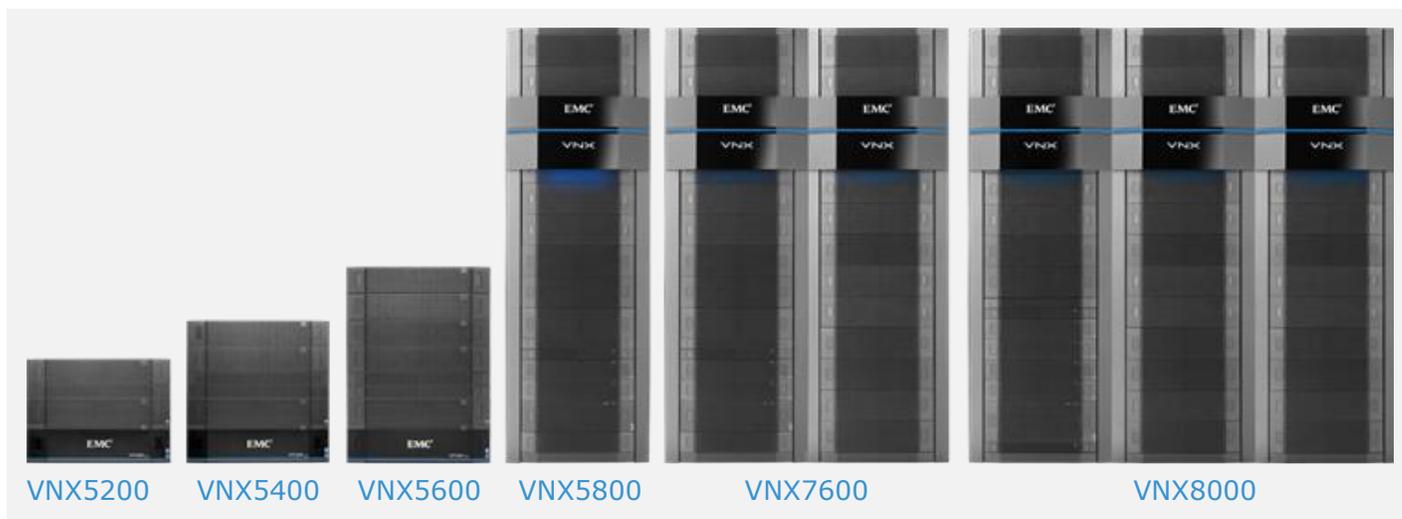


# EMC VNX SERIES UNIFIED STORAGE SYSTEMS



EMC® VNX® series unified storage systems deliver uncompromising scalability and flexibility for the mid-tier while providing market-leading simplicity and efficiency to minimize total cost of ownership.

## Specifications

### ARCHITECTURE

Based on the powerful new family of Intel Xeon E5-2600 (Sandy Bridge) processors, the EMC VNX implements a modular architecture that integrates hardware components for block, file, and object with concurrent support for native NAS, iSCSI, Fibre Channel, and FCoE protocols. The series delivers file (NAS) functionality via two-to-eight Data Movers and block (iSCSI, FCoE, and FC) storage via dual Storage Processors leveraging full 6 Gb SAS disk drive topology. The system leverages the **patented MCx™ multi-core storage software operating environment** that delivers unparalleled performance efficiency. You can choose between block services, file services, or unified services. The unified configuration includes the following rack-mounted enclosures:

- **Block Services:** Disk processor enclosure (includes disk drives) or storage processor enclosure (no drives included) plus standby power system. Capacity for Block or File use cases is added via Disk Array Enclosures (DAEs)
- **File and Unified Services:** One or more Data Mover enclosures and a Control Station to deliver file protocols.



## VNX PHYSICAL SPECIFICATIONS

BLOCK COMPONENTS	VNX5200	VNX5400	VNX5600	VNX5800	VNX7600	VNX8000
<b>Min/Max Drives</b>	4/125	4/250	4/500	4/750	4/1000	4/1500
<b>Max FAST Cache</b>	600GB	1TB	2TB	3TB	4.2TB	4.8TB
<b>Array Enclosure</b>	3U Disk Processor Enclosure (Holds 25x2.5" SAS/Flash drives)					4U Storage Processor Enclosure (No drives)
<b>Drive Enclosure Options (Disk Array Enclosure - DAE)</b>	All models support 2U 25 drive trays for 2.5" SAS/Flash drives All models support 3U 15 drive trays for 3.5" SAS/Flash drives VNX5400 and above support 4U 60 drive trays for 3.5" SAS/Flash drives VNX5400 and above support 3U 120 drive trays for 2.5" SAS/Flash drives					
<b>Standby Power System</b>	Internal batteries, one for each storage processor					2x 2U rack mounted 2.2KW Li-Ion
<b>RAID Options</b>	0/1/10/3/5/6					
<b>CPU/Memory per Array</b>	2 x Intel Xeon E5-2600 4-Core 1.2 GHz /32 GB	2 x Intel Xeon E5-2600 4-Core 1.8 GHz /32 GB	2 x Intel Xeon E5-2600 4-Core 2.4 GHz /48 GB	2 x Intel Xeon E5-2600 6-Core 2.0 GHz /64 GB	2 x Intel Xeon E5-2600 8-Core 2.2GHz /128 GB	4 x Intel Xeon E5-2600 8-Core 2.7GHz /256 GB
<b>Max Block UltraFlex™ IO Modules per Array</b>	6	8	10	10	10	22
<b>Embedded SAS IO Ports per Array</b>	4 x 4 lane 6Gb/s SAS ports (for BE Connection)					NA
<b>Base 6 Gb/s SAS BE Buses per Array</b>	2 x 4 Lane	2 x 4 Lane	2 x 4 Lane	2 x 4 Lane	2 x 4 Lane	8 x 4 Lane
<b>Max 6 Gb/s SAS BE Buses per Array</b>	2 x 4 Lane	2 x 4 Lane	6 x 4 Lane or 2 x 4 Lane + 2 x 8 Lane	6 x 4 Lane or 2 x 4 Lane + 2 x 8 Lane	6 x 4 Lane or 2 x 4 Lane + 2 x 8 Lane	16 x 4 Lane or 8 x 8 Lane
<b>Max Total Ports per Array</b>	28	36	44	44	44	88
<b>Max FC Ports per Array</b>	24	32	40	40	40	72
<b>1 GBaseT iSCSI Max Total Ports per Array</b>	24	32	32	32	32	32
<b>10 GbE iSCSI Max Total Ports per Array</b>	12	16	20	20	20	32
<b>Max FCoE Total Ports per Array</b>	12	16	20	20	20	36
<b>FILE COMPONENTS**</b>						
<b># File Data Movers</b>	1-3	1-4	1-4	2-6	2-8	2-8
<b># Control Stations</b>	1 x 1U Server standard, 2nd x 1U Server optional					
<b>Data Mover: CPU/Memory</b>	Intel Xeon 5600 / 6 GB	Intel Xeon 5600 / 6 GB	Intel Xeon 5600 / 12 GB	Intel Xeon 5600 / 12 GB	Intel Xeon 5600 / 24 GB	Intel Xeon 5600 / 24 GB
<b>Max File UltraFlex IO Modules per</b>	3	3	3	4	4	5

<b>Data Mover***</b>						
<b>Min/Max 2/4/8 Gb/s FC Ports per Data Mover</b>	4	4	4	4	4	4
<b>Max IP Ports per Data Mover</b>	8	8	8	12	12	16
<b>Max 1 GBaseT Ports per Data Mover</b>	8	8	8	12	12	16
<b>Max 10 GbE Ports per Data Mover</b>	4	4	4	6	6	8
<b>Management</b>	LAN 2x 10/100/1000 Copper GbE					
<b>FUNCTIONAL LIMITS</b>						
<b>Max Raw Capacity</b>	500 TB	1,000 TB	2,000 TB	3,000 TB	4,000 TB	6,000 TB
<b>Max SAN Hosts</b>	1,024	1,024	1,024	2,048	4,096	8,192
<b>Max Number of Pools</b>	15	20	40	40	60	60
<b>Max Number of LUNs (Pool)</b>	1,000	1,000	1,100	2,100	3,000	4,000
<b>Max Number of LUNs (Classic)</b>	2048	2048	4096	4096	8192	8192
<b>Max Pool Based LUN Size</b>	256 TB (Virtual Pool LUN)	256 TB (Virtual Pool LUN)	256 TB (Virtual Pool LUN)	256 TB (Virtual Pool LUN)	256 TB (Virtual Pool LUN)	256 TB (Virtual Pool LUN)
<b>Max File System Size</b>	16 TB	16 TB	16 TB	16 TB	16 TB	16 TB
<b>Maximum Usable File Capacity per Data Mover</b>	256 TB	256 TB	256 TB	256 TB	512TB	512 TB
<b>OS Support</b>	Block OS's see EMC E-Lab™ Navigator and NAS Support Matrix on EMC.com					

\* The 60-Drive 4U DAE and the 120-drive 3U DAE are top-loading and require a high-density EMC rack or equivalent.

\*\* The File components are not required when ordering a block-only system.

\*\*\* Includes One UltraFlex IO Module per Data Mover reserved for connection to the captive array.

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## VNX CONNECTIVITY

The VNX series provides flexible connectivity options via UltraFlex IO modules for both the file Data Movers for NAS connectivity and the block storage processors for FC and iSCSI host connectivity (see above table for number of modules supported per blade or SP).

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### ULTRAFLEX IO MODULE OPTIONS (BLOCK)

IO MODULE	DESCRIPTION
<b>Four-Port 16Gb/s Fibre Channel Module</b>	FC module with four ports auto-negotiating to 4/8/16 Gbps; uses optical SFP and OM2/OM3 cabling to connect directly to host HBA or FC switch
<b>Four-Port 8Gb/s Fibre Channel Module</b>	FC module with four ports auto-negotiating to 2/4/8 Gbps; uses optical SFP and OM2/OM3 cabling to connect directly to host HBA or FC switch
<b>Four-Port 1 Gb/s iSCSI Module with TOE</b>	iSCSI module with four 1 GBaseT RJ-45 copper connections to Cat 6 cabling to Ethernet switch; includes TCP offload engine
<b>Two-Port 10 Gb/s Opt iSCSI Module with TOE</b>	iSCSI module with two 10 Gb/s Ethernet ports and choice of SFP+ optical connection or active twinax copper connection to Ethernet switch; includes TCP offload engine
<b>Two-Port 10 GBASE-T iSCSI Module with TOE</b>	iSCSI module with two 10 GBaseT Ethernet ports with copper connection to Ethernet switch; includes TCP offload engine
<b>Two-Port 10 GbE FCoE Module</b>	FCoE module with two 10 Gb/s Ethernet ports and choice of SFP+ optical connection or active twinax copper connection to converged enhanced Ethernet switch
<b>Four-Port 6Gb/s SAS V3.0 Module</b>	SAS module, used for back-end storage (DAE) connectivity to Block Storage Processors. Each SAS port has 4 lanes/port @ 6Gb, delivering 24Gbps nominal throughput and connects to PCI-E Gen3. Can be configured as 4x4x6 or 2x8x6.

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### ULTRAFLEX IO MODULE OPTIONS (FILE)

<b>Four-Port 1 GBASE-T IP Module</b>	10/100/1000 BaseT module with four ports supporting RJ-45 copper connections to Cat 6 cabling to Ethernet switch
<b>Two-Port 10 GbE Opt IP Module</b>	IP module with two 10 Gb/s Ethernet ports and choice of SFP+ optical connection or active twinax copper connection to Ethernet switch
<b>Two-Port 10 GBASE-T IP Module</b>	IP module with two 10 GBaseT Ethernet ports with copper connection to Ethernet switch
<b>Four-Port 8 Gb/s Fibre Channel Module</b>	FC module with four ports auto-negotiating to 2/4/8 Gbps; uses optical SFP and OM2/OM3 cabling to connect directly to captive array and to provide NDMP tape connection

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## MAXIMUM CABLE LENGTHS

Shortwave optical OM2: 50 meters (8 Gb), 100 meters (4 Gb), and 300 meters (2 Gb)

Shortwave optical OM3: 100 meters (16 Gb) 150 meters (8 Gb), 380 meters (4 Gb), and 500 meters (2 Gb)

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## BACK-END (DISK) CONNECTIVITY

Each storage processor connects to one side of each of two, four, eight or sixteen (depending on model) redundant pairs of four-lane x 6 Gb/s Serial Attached SCSI (SAS) buses, providing continuous drive access to hosts in the event of a storage processor or bus fault. VNX models require four "vault" drives (SAS or Near-line SAS) and support a platform specific maximum number of disks (see VNX physical specifications table above). 300 GB per vault drive is consumed by VNX operating environment software and data structures.

## DISK ARRAY ENCLOSURES (DAE)

	15 x 3.5" Drive DAE	60 x 3.5" Drive DAE	25 x 2.5" Drive DAE	120 x 2.5" Drive DAE
<b>Drive Types Supported</b>	FLASH, SAS and NL-SAS			
<b>Drive Mixing</b>	No limitations	No limitations	No limitations	No limitations
<b>Controller Interface</b>	6 Gb SAS	6 Gb SAS	6 Gb SAS	6 Gb SAS

## SOLID STATE DISK DRIVES

Nominal Capacity	100 GB SSD	200 GB SSD	400 GB SSD	800 GB SSD	1.6 TB SSD	3.2 TB SSD
<b>SLC</b>	✓	✓	no	no	no	no
<b>eMLC</b>	no	✓	✓	✓	✓	✓
<b>TLC*</b>	no	no	✓	✓	✓	no
<b>FAST Cache**</b>	✓	✓	✓	no	no	no
<b>FAST VP***</b>	no	✓	✓	✓	✓	no
<b>All-Flash Pool</b>	no	✓	✓	✓	✓	✓
<b>Formatted Capacity (GB)****</b>	91.7	183.4	366.7	733.5	1467.45	2919.96
<b>Supported in 15 drive DAE</b>	✓	✓	✓	✓	✓	no
<b>Supported in 25 drive DAE</b>	✓	✓	✓	✓	✓	✓
<b>Supported in 60 drive DAE</b>	✓	✓	✓	✓	✓	no
<b>Supported in 120 Drive DAE</b>	✓	✓	✓	✓	✓	✓
<b>Interface</b>	6 Gb SAS					

## NOMINAL POWER CONSUMPTION (WATTS)

<b>Operating Mode</b>	4.25	4.25	4.25	4.25	4.25	4.25
<b>Idle Mode</b>	2.0	2.0	2.0	2.0	2.0	2.0

\* 3D NAND TLC SSDs can only be used in an all-flash pool. They are only available in 2.5" form factor in 25-drive and 120-drive DAEs.

\*\* FAST Cache uses SLC SSDs (for implementations of 600GB or less total usable capacity) and 200GB & 400GB eMLC SSDs (for implementations of 800GB or greater total usable capacity).

\*\*\* FAST VP uses eMLC SSDs except for the 3.2TB eMLC SSD.

\*\*\*\* Formatted to 520 bytes/sector, 1 MB = 1,048,576 bytes

## ROTATING DISK DRIVES

Nominal Capacity	300 GB Drive	600 GB Drive	600 GB Drive	900 GB Drive	1.2TB Drive	1 TB Drive	2 TB Drive	3 TB Drive	4 TB Drive
<b>Formatted Capacity (GB)</b>	268.3	536.7	536.7	820.5	1100.5	917.1	1834.3	2751.4	3668.6
<b>Supported in 15 drive DAE</b>	√	√	√	√	√		√	√	√
<b>Supported in 60 drive DAE</b>	√	√	√	√	√		√	√	√
<b>Supported in 25 drive DAE</b>	√	√	√	√	√	√			
<b>Supported in 120 Drive DAE</b>	√	√	√	√	√				
<b>Rotational Speed</b>	15,000 rpm	15,000 rpm	10,000 rpm	10,000 rpm	10,000 rpm	7,200 rpm	7,200 rpm	7,200 rpm	7,200 rpm
<b>Interface</b>	6 Gb SAS	6 Gb SAS	6 Gb SAS	6 Gb SAS	6 Gb SAS	6 Gb SAS	6 Gb SAS	6 Gb SAS	6 Gb SAS
<b>Data Buffer</b>	16 MB min	16 MB min	16 MB min	16 MB min	16 MB min	16 MB min	16 MB min	16 MB min	16 MB min

## ACCESS TIME

<b>Average Read</b>	2.8 msec	3.4 msec	3.7 msec	3.7 msec	3.7 msec	7.7 msec	8.5 msec	8.5 msec	8.5 msec
<b>Average Write</b>	3.3 msec	3.9 msec	4.2 msec	4.2 msec	4.2 msec	8.7 msec	9.5 msec	9.5 msec	9.5 msec
<b>Rotation Latency</b>	2.0 msec	2.0 msec	3.0 msec	3.0 msec	3.0 msec	4.16 msec	4.16 msec	4.16 msec	4.16 msec

## NOMINAL POWER CONSUMPTION (WATTS)

<b>Operating Mode</b>	9.07	12.92	5.6	5.6	5.6	7.44	12.2	12.2	12.2
<b>Idle Mode</b>	5.25	8.74	3.1	3.1	3.1	4.84	8.0	8.0	8.0

## VNX OE PROTOCOLS AND SOFTWARE FACILITIES

The VNX series offers support for a wide variety of protocols and advanced features available via various software suites and packs.

PROTOCOLS AND FACILITIES SUPPORTED		
Access-based Enumeration (ABE) for Microsoft Windows Server 2003	Failsafe Networking	NT LAN Manager (NTLM)
Address Resolution Protocol (ARP)	Internet Control Message Protocol (ICMP)	Object support via EMC Atmos™ Virtual Edition
Automated Volume Management (AVM): file system provisioning	Kerberos Authentication	Portmapper v2
Block Protocols: iSCSI, Fibre Channel (FCP SCSI-3), and FCoE	Lightweight Directory Access Protocol (LDAP)	Restriction of Hazardous Substances (RoHS) compliance
Common Criteria Certification: EAL 2+FLR Assurance Level	LDAP signing for Windows	Routing Information Protocol (RIP) v1-v2
Controller based Data at Rest Encryption (D@RE) <sup>1*</sup>	Link Aggregation (IEEE 802.3ad)	SMI-S v1.6 compatible VNX File client
DFS Distributed File System (Microsoft) as Leaf node or Root Server	MetroSync and MetroSync Manager	Simple Network Management Protocol V1-V3 (SNMP)
Ethernet Trunking	Management Port IPv4 and/or IPv6	Simple Network Time Protocol (SNTP)
File Protocols: NFSv2, v3, v4, and v4.1 with pNFS; CIFS (SMB 1, SMB 2 and SMB 3); FTP (including SFTP and FTPs)	Network Data Management Protocol (NDMP) v1-v4	UNIX archive utilities (tar/cpio)
FileMover API: Open API for automated, transparent data movement between tiers of the storage network	Network Information Service (NIS) Client	Virtual Data Movers for Microsoft Windows clients
Lock Manager (NLM) v1, v3, and v4	Network Status Monitor (NSM) v1	Virtual LAN (IEEE 802.1q)
	Network Time Protocol (NTP) client	

<sup>1</sup> Controller based D@RE has been submitted for FIPS 140-2 validation check status [here](#)

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**VNX5200, VNX5400, VNX5600, VNX5800, VNX7600 AND VNX8000**

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**Unisphere™ Management Suite:**

Simple, intuitive management, monitoring and troubleshooting for VNX

Management Software includes:  
Unisphere element manager (Block / File / Unified)  
Unisphere Central (consolidated dashboard and alerting)  
Unisphere Analyzer (monitoring and troubleshooting)  
Unisphere QoS Manager (Quality of Service)  
VNX Monitoring and Reporting (SRM Lite for VNX)

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**Protocols**

CIFS, NFS, pNFS, FC, FCoE, iSCSI included

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**Base Software (VNX OE)**

Core storage capabilities (connectivity, efficiency and migration) included at no extra cost

*Includes:*  
All Protocols (See above)  
Thin Provisioning  
Fixed Block Deduplication (File and Block Use Cases)  
Block Compression  
File Deduplication and Compression  
SAN Copy  
VDM MetroSync

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**AppSync™**

Self-service application copy management  
Prove protection compliance

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**Storage Analytics**

VMware® vRealize™ Operations for VNX, EMC Adapter for VNX

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**VNX Software Essentials**

FAST Cache and FAST VP  
Optimize performance and cost concurrently with

- Dynamic tiering of data across drives
- Extendable cache for performance boost

Block Storage snaps and clones  
File system snaps  
Continuous data protection for DVR-like recovery for block storage  
Unified storage replication with DVR-like recovery  
Granular file system level replication and recovery  
Integrate WAN deduplication and bandwidth reduction plus

- 15 VM licenses for RecoverPoint for VM
- 5 VPLEX-VE licenses

Disk-based WORM functionality  
Anti-virus integration and alerting

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**Encryption**

Controller-based Data at Rest Encryption (D@RE)

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NOTE: For more details on software licensing, please contact your sales representative

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## VIRTUALIZATION SOLUTIONS

The VNX series offers support for a wide variety of protocol and advanced features available via various software suites and packs including but not limited to:

- EMC Virtual Storage Integrator (VSI) for VMware vSphere™: For provisioning, management, cloning, and deduplication
- Site Recovery Manager (SRM) Integration: Managing failover and failback making disaster recovery rapid and reliable
- Virtualization API Integration: VMWare: VAAI and VASA. Hyper-V: Offloaded Data Transfer (ODX) and Offload Copy for File
- AppSync: Host-based, service oriented management of array-based copies of data
- EMC Storage Integrator (ESI) – For provisioning within the Microsoft management context (Systems Center) for Hyper-V and SharePoint

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## ADDITIONAL OPTIONAL EMC TITLES

- Data Protection Suite: Back Up, Archive and Collaboration software
- EMC VIPR SRM Suite®: VNX integration with EMC Storage management infrastructure
- EMC PowerPath®: path management
- EMC Cloud Tiering Appliance (CTA and CTA/VE): policy-based cloud tiering, file archiving, and migration

# VNX ELECTRICAL SPECIFICATIONS

All power numbers are based on maximum achievable power consumption (all slots full) at 25°C ambient. For configuration specific power specifications please refer to the EMC Capacity Calculator at <https://inside.emc.com/docs/DOC-41397>

## DISK PROCESSOR ENCLOSURES

VNX5200 DPE 25 2.5" 15K drives and six IO modules	VNX5400 DPE 25 2.5" 15K drives and (8) IO modules	VNX5600 DPE 25 2.5" 15K drives and ten IO Modules	VNX5800 DPE 25 2.5" 15K drives and ten IO modules	VNX7600 DPE 25 2.5" 15K drives and ten IO modules	VNX8000 SPE 22 IO modules
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## POWER

	Yes*	Yes*	Yes*	Yes*	
					
<b>AC Line Current (operating maximum)</b>	5.07A max at 200 Vac 9.68 A max at 100Vac	5.07 A max at 200 Vac 9.68 A max at 100Vac	5.12 A max at 200 Vac 9.96 A max at 100Vac	5.17 A max at 200 Vac 10.08 max at 100Vac	5.29 A max at 200 Vac 10.29 max at 100Vac
<b>Power Consumption (operating maximum)</b>	1014 VA (967W) max 200 Vac 986VA (971W) max 100 Vac	1014 VA (967W) max 200Vac 986VA (971W) max 100 Vac	1023 VA (977 W) max 200 Vac 996 VA (980W) max 100 Vac	1034 VA (988 W) max 200 Vac 1008 VA(993W) max 100 Vac	1057 VA (1011 W) max 200Vac 1029VA(1014W) max 100Vac
<b>Power Factor</b>	0.95 min at 200V at full load, low voltage 0.98 min at 100V at full load, low voltage				0.98 min at full load, low voltage
<b>Heat Dissipation (operating maximum)</b>	3.48 x 10 <sup>6</sup> J/hr, (3,300 Btu/hr) max (200V) 3.50 x 10 <sup>6</sup> J/hr, (3,313 Btu/hr) max (100V*)	3.48 x 10 <sup>6</sup> J/hr, (3,300 Btu/hr) max (200V) 3.50 x 10 <sup>6</sup> J/hr, (3,313 Btu/hr) max (100V*)	3.52 x 10 <sup>6</sup> J/hr, (3,334 Btu/hr) max (200V) 3.53 x 10 <sup>6</sup> J/hr, (3,344 Btu/hr) max (100V*)	3.56 x 10 <sup>6</sup> J/hr, (3,371 Btu/hr) max (200V) 3.57 x 10 <sup>6</sup> J/hr, (3,388 Btu/hr) max (100V*)	3.64 x 10 <sup>6</sup> J/hr, (3,450 Btu/hr) max (200V) 3.65 x 10 <sup>6</sup> J/hr, (3,460 Btu/hr) max (100V*)
<b>In-rush Current</b>	45 A max for ½ line cycle, per line cord at 240 Vac				30 A max for ½ line cycle, per line cord at 240 Vac
<b>Startup Surge Current</b>	30 A rms max for 1 ms, at any line voltage				29 A max., prior to HVDC regulation, for 50 ms, during startup or after AC interruption
<b>AC Protection</b>	15 A fuse on each power supply				
<b>AC Inlet Type</b>	IEC320-C14 appliance coupler, per power zone				
<b>Ride-through Time</b>	10 ms min				12 ms min
<b>Current Sharing</b>	± 5 percent of full load, between power supplies				
<b>DIMENSIONS</b>					
<b>Weight kgs/lbs</b>	empty 39.93/83.72	empty 39.93/83.72	empty 39.93/83.72	empty 39.93/83.72	empty 39.93/83.72
<b>Vertical size</b>	3 NEMA units	3 NEMA units	3 NEMA units	3 NEMA units	4 NEMA units
<b>Height cm/inches</b>	13.33/5.25	13.33/5.25	13.33/5.25	13.33/5.25	17.78/7.00
<b>Width cm/inches</b>	44.76/17.62	44.76/17.62	44.76/17.62	44.76/17.62	44.47/17.6
<b>Depth cm/inches</b>	69.92/24.77	69.92/24.77	69.92/24.77	69.92/24.77	81.5/32.1

\*Restrictions apply to the use of Near Line SAS drives

## Disk Array Enclosures

	15x3.5" Disk Array Enclosure	60x3.5" Disk Array Enclosure	25x2.5" Disk Array Enclosure	120x2.5" Disk Array Enclosure
<b>POWER</b>				
<b>AC Line Current (operating maximum)</b>	2.93 A max at 100 Vac, 1.56 A max at 200 Vac	6.0 A max at 200 Vac 12.0 A max at 100 Vac	3.5 A max at 100 Vac, 1.62 A max at 200 Vac	8.06 A max at 200 Vac
<b>Power Consumption (operating maximum)</b>	312 VA (293 W) max	1200 VA (1,130 W) max	325 VA (301 W) max	1611 VA (2160 W) max
<b>Power Factor</b>	0.95 min at full load, low voltage	0.98 min at full load, low voltage	0.98 min at full load, low voltage	0.98 min at full load, low voltage
<b>Heat Dissipation (operating maximum)</b>	1.06 x 10 <sup>6</sup> J/hr, (1,000 Btu/hr) max	4.07 x 10 <sup>6</sup> J/hr, (3,860 Btu/hr) max	1.08 x 10 <sup>6</sup> J/hr, (1,027 Btu/hr) max	5.63 x 10 <sup>6</sup> J/hr, (5337 Btu/hr) max
<b>In-rush Current</b>	50 A max for ½ line cycle, per line cord at 240 Vac  25 A max for ½ line cycle, per line cord at 120 Vac	30 A max for ½ line cycle, per line cord at 240 Vac  15 A max for ½ line cycle, per line cord at 120 Vac	50 A max for ½ line cycle, per line cord at 240 Vac  25 A max for ½ line cycle, per line cord at 120 Vac	30 A max for ½ line cycle, per line cord at 240 V AC
<b>Startup Surge Current</b>	10.6 A rms max for 100 ms, at any line voltage	27 A rms max for 100 ms, at any line voltage	10.6 A rms max for 100 ms, at any line voltage	25 A rms max for 100 ms, at any line voltage
<b>AC Protection</b>	10 A fuse on each power supply, both phases	12 A fuse on each line cord, both phases	10 A fuse on each power supply, both phases	12 A fuse on each power supply, both phases
<b>AC Inlet Type</b>	IEC320-C14 appliance coupler, per power zone	Two IEC320-C14 appliance couplers, per power zone	IEC320-C14 appliance coupler, per power zone	Two IEC320-C14 appliance couplers, per power zone
<b>Ride-through Time</b>	30 ms min	30 ms min	30 ms min	12 ms min per supply
<b>Current Sharing</b>	± 10 percent of full load, between power supplies	± 10 percent of full load, between power supplies	± 10 percent of full load, between power supplies	± 10 percent of full load, between power supplies
<b>WEIGHTS AND DIMENSIONS</b>				
<b>Weight kg/lbs</b>	Empty: 14.5/32 Full: 30.8/68	Empty: 36.7/81 Full: 97/213.3	Empty: 10.0/22.1 Full: 20.23/44.61	Empty 22.7/50 Full: 65.4/144.2
<b>Vertical size</b>	3 NEMA units	4 NEMA units	2 NEMA units	3 NEMA units
<b>Height cm/inches</b>	13.33/5.25	17.78/7.00	8.46/3.40	20/5.2
<b>Width cm/inches</b>	44.45/17.5	44.45/17.5	44.45/17.5	44.74/17.6
<b>Depth cm/inches</b>	35.56/14	110.5/43.5	33.02/13	110.5/43.5

## VNX 8000 Standby Power Supply

<b>POWER</b>	2.2KW 2U SPS (Note all ratings assume fully configured systems)
<b>AC Line Voltage</b>	200 to 240 Vac $\pm$ 10%, single-phase, 47 to 63 Hz
<b>AC Line Current, Internal and Pass-through</b>	0.25 A max at 200 Vac, internal power consumption (Up to 11.25 A max at 200 Vac, pass-through to AC outlets)
<b>Internal Power Consumption</b>	150 VA (135 W) peak in hi-charge mode, 20 VA (12 W) in float charge mode
<b>Power Factor</b>	N/A for pass-through load, internal 10 VA load is 0.60 power factor
<b>Heat Dissipation</b>	$1.08 \times 10^5$ J/hr, (100 Btu/hr) steady state
<b>In-rush Current</b>	15 A max for 1/2 line cycle, per power supply at 240 Vac
<b>AC Protection</b>	20 A circuit breaker
<b>AC Inlet Type</b>	IEC320-C14 appliance coupler with switch
<b>AC Outlet Type</b>	IEC320-C13 appliance coupler, quantity four
<b>Charge Times</b>	6.0 hours max
<b>AC Failure Detect Time</b>	12 ms max
<b>Transfer Time</b>	25 ms max
<b>Dimensions (H/W/L)</b>	3.50 in/16.5 in/28 in or 8.89 cm/41.90 cm/71.12 cm
<b>Weight</b>	29 lb/13.2 Kg

NOTE: Each VNX8000 SPE requires a Standby Power Supply (see the following information)

## CABINETS

	<b>STANDARD 40U CABINET</b>	<b>DENSE 40U CABINET</b>
<b>AC Line Voltage</b>	200 to 240 Vac $\pm$ 10%, single-phase, 47 to 63 Hz	200 to 240 Vac $\pm$ 10%, single-phase, 47 to 63 Hz
<b>Power Configuration</b>	Two power domains (base and extended), each redundant	One, two, three or four power domains, each redundant
<b>Power Inlet Count</b>	Either two (for redundant base configuration) or four (for redundant extended configuration)	Two, four, six, or eight (two per domain)
<b>Plug Types</b>	NEMA L6-30P or IEC309-332 P6 or IP57 (Australia)	NEMA L6-30P or IEC309-332 P6 or IP57 (Australia)
<b>Input Power Capacity</b>	4,800 VA @ 200 Vac, 5,760 VA @ 240 Vac (base configuration) 9,600 VA @ 200 Vac, 11,520 VA @ 240 Vac (extended configuration)	1 Domain: 4,800 VA @ 200 Vac, 5,760 VA @ 240 Vac 2 Domain: 9,600 VA @ 200 Vac, 11,520 VA @ 240 Vac 3 Domain: 14,400 VA @ 200 Vac, 17,280 VA @ 240 Vac 4 Domain: 19,200 VA @ 200 Vac, 23,040 VA @ 240 Vac
<b>AC Protection</b>	30 A site circuit breakers on each power branch	30A site circuit breakers on each power branch (8 max)
<b>40U Cabinet Dimensions</b>	Height - 75 in (190.8 cm); Width - 24.0 in (61.1 cm); Depth - 39.0 in (99.2 cm); Weight Empty - 380 lb (173 kg)	Height - 75 in (190.8 cm); Width - 24.0 in (61.1 cm); Depth - 44 in (111.8 cm); Weight Empty - 435 lb (197.3 kg)

## DATA MOVER ENCLOSURES (DME) AND CONTROL STATIONS

	VNX5200	VNX5400	VNX5600	VNX5800	VNX7600	VNX8000	Control Station
	(1) DME with (2) Data Movers max configuration						1
<b>POWER</b>							
<b>AC Line Voltage</b>	100 to 240 Vac± 10%, single-phase, 47 to 63 Hz						
<b>AC Line Current (operating maximum)</b>	5.3 A max at 100 Vac, 2.7 A max at 200 Vac						1.0 A max at 100 Vac, 0.5 A max at 200 Vac
<b>Power Consumption (operating maximum)</b>	530 VA (485 W) max						100 VA (90 W) max
<b>Power Factor</b>	0.98 min at full load, low voltage						0.90 min at full load, low voltage
<b>Heat Dissipation (operating maximum)</b>	1.76 x 10 <sup>6</sup> J/hr, (1,655 Btu/hr) max						3.24 x 10 <sup>5</sup> J/hr, (310 Btu/hr) max
<b>In-rush Current</b>	15 A max for ½ line cycle, per line cord at 240 Vac 8 A max for ½ line cycle, per line cord at 120 Vac						
<b>Startup Surge Current</b>	27 A rms max for 50 ms, at any line voltage						NA
<b>AC Protection</b>	7.8 A fuse on each power supply, both phases						NA
<b>AC Inlet Type</b>	IEC320-C14 appliance coupler, per power zone						
<b>Ride-through Time</b>	30 ms min						NA
<b>Current Sharing</b>	± 15 percent of full load, between power supplies						NA
<b>DIMENSIONS</b>							
<b>Weight</b>	23.8 kg (52.5 lb) including 2 Data Movers						10.57kg (23.3 lb)
<b>Vertical size</b>	2 NEMA units						1 NEMA unit
<b>Height</b>	8.89 cm (3.50 in)						4.26 cm (1.74 in)
<b>Width</b>	44.45 cm (17.50 in)						44.31 cm (17.4 in)
<b>Depth</b>	61.0 cm (24.0 in)						55.37 cm (21.8in)

## OPERATING ENVIRONMENT (MEETS ASHRAE EQUIPMENT CLASS A3)

<b>Recommended Range Operation</b>	The limits under which equipment will operate the most reliably while still achieving reasonably energy-efficient data center operation.	18°C to 27°C (64.4°F to 80.6°F) at 5.5°C (41.9°F) dew point to 60% relative humidity and 15°C (59°F) dew point
<b>Continuous Allowable Range Operation</b>	Data center economization techniques (e.g. free cooling) may be employed to improve overall data center efficiency. These techniques may cause equipment inlet conditions to fall outside the recommended range but still within the continuously allowable range. Equipment may be operated without any hourly limitations in this range.	10°C to 35°C (50°F to 95°F) at 20% to 80% relative humidity with 21°C (69.8°F) maximum dew point (maximum wet bulb temperature). Derate maximum allowable dry bulb temperature at 1°C per 300m above 950m (1°F per 547 ft above 3117 ft).
<b>Expanded Allowable Range Operation</b>	During certain times of the day or year, equipment inlet conditions may fall outside the continuously allowable range but still within the expanded allowable range. Equipment operation is limited to ≤ 10% of annual operating hours in this range.	5°C to 10°C and 35°C to 40°C (with no direct sunlight on the equipment) at -12°C dew point and 8% to 85% relative humidity with 24°C dew point (maximum wet bulb temperature). Outside the continuously allowable range (10°C to 35°C), the system can operate down to 5°C or up to

### Exceptions to Expanded Allowable Range Operation

When operating in the expanded allowable temperature range, system performance is guaranteed while the system is awaiting or being serviced.

When operating in the expanded allowable temperature range certain enclosure limitations apply.

40°C for a maximum of 10% of its annual operating hours. For temperatures between 35°C and 40°C (95°F to 104°F), de-rate maximum allowable dry bulb temperature by 1°C per 175m above 950m (1°F per 319 ft above 3117 ft).

Due to certain rare operational modes, it is recommended that service be deferred on 60x3.5" and 120x2.5" Disk Array Enclosures (DAE) when temperatures exceed 35°C.

The VNX8000 cannot operate at > 35C if the VNX8000 SPE and more than 9 120x2.5"DAE's are in a single EMC deep rack. At >35 the 120x2.5" DAE is limited to no more than 10 in a single upgrade rack.

### Temperature Gradient

20°C / hour (36°F / hour)

### Altitude

Max Operating

3050m (10,000ft)

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## ELECTROMAGNETIC EMISSIONS AND IMMUNITY

FCC Class A EN55022 Class A

CE Mark VCCI Class A (for Japan)

ICES-003 Class A (for Canada) AS/NZS 3548 Class A (for Australia/New Zealand)

EN55024 Immunity, ITE BSMI Class A (for Taiwan)

## QUALITY AND SAFETY STANDARDS

UL 60950; CSAC 22.2-60950, EN 60950

Manufactured under an ISO 9000-registered quality system

ETSI EN 300 386

## CONTACT US

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