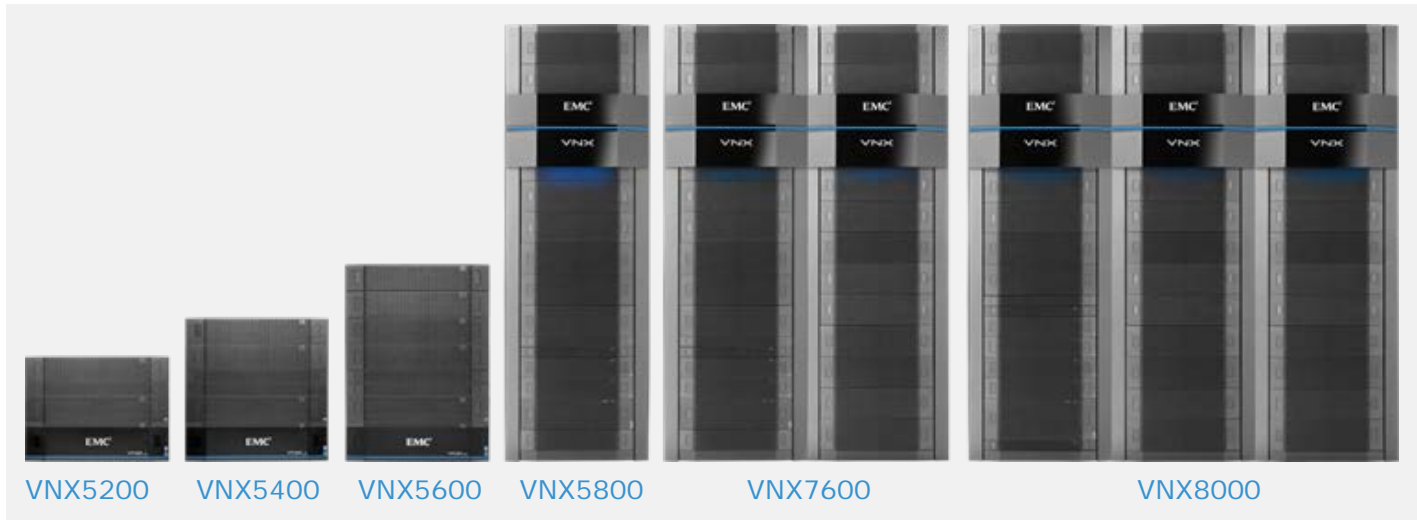


EMC VNX SERIES UNIFIED STORAGE SYSTEMS



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)



REDEFINE

SPECIFICATION SHEET

The EMC logo, featuring the text "EMC" with a superscript "2" and a registered trademark symbol.

- **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
Min/Max Drives	4/125	4/250	4/500	4/750	4/1000	4/1500
Max FAST Cache	600GB	1TB	2TB	3TB	4.2TB	4.2TB
Array Enclosure	3U Disk Processor Enclosure (Holds 25x2.5" SAS/Flash drives)					4U Storage Processor Enclosure (No drives)
Drive Enclosure Options (Disk Array Enclosure - DAE)	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					
Standby Power System	Internal batteries, one for each storage processor					2x 2U rack mounted 2.2KW Li-Ion
RAID Options	0/1/10/3/5/6					
CPU/Memory per Array	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
Max Block UltraFlex™ IO Modules per Array	6	8	10	10	10	22
Embedded SAS IO Ports per Array	4 x 4 lane 6Gb/s SAS ports (for BE Connection)					NA
Base 6 Gb/s SAS BE Buses per Array	2 x 4 Lane	2 x 4 Lane	2 x 4 Lane	2 x 4 Lane	2 x 4 Lane	8 x 4 Lane
Max 6 Gb/s SAS BE Buses per Array	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
Max Total Ports per Array	28	36	44	44	44	88
2/4/8 Gb/s FC Max Ports per Array	24	32	40	40	40	72
1 GBaseT iSCSI Max Total Ports per Array	24	32	32	32	32	32
10 GbE iSCSI Max Total Ports per Array	12	16	20	20	20	32
Max FCoE Total Ports per Array	12	16	20	20	20	36
FILE COMPONENTS**						
# File Data Movers	1-3	1-4	1-4	2-6	2-8	2-8
# Control Stations	1 x 1U Server standard, 2nd x 1U Server optional					

Data Mover: CPU/Memory	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
Max File UltraFlex IO Modules per Data Mover***	3	3	3	4	4	5
Min/Max 2/4/8 Gb/s FC Ports per Data Mover	4	4	4	4	4	4
Max IP Ports per Data Mover	8	8	8	12	12	16
Max 1 GBaseT Ports per Data Mover	8	8	8	12	12	16
Max 10 GbE Ports per Data Mover	4	4	4	6	6	8
Management	LAN 2x 10/100/1000 Copper GbE					
FUNCTIONAL LIMITS						
Max Raw Capacity	500 TB	1,000 TB	2,000 TB	3,000 TB	4,000 TB	6,000 TB
Max SAN Hosts	1,024	1,024	1,024	2,048	4,096	8,192
Max Number of Pools	15	20	40	40	60	60
Max Number of LUNs (Pool)	1,000	1,000	1,100	2,100	3,000	4,000
Max Number of LUNs (Classic)	2048	2048	4096	4096	8192	8192
Max Pool Based LUN Size	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)
Max File System Size	16 TB	16 TB	16 TB	16 TB	16 TB	16 TB
Maximum Usable File Capacity per Data Mover	256 TB	256 TB	256 TB	256 TB	512TB	512 TB
OS Support	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.

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).

ULTRAFLEX IO MODULE OPTIONS (BLOCK)

IO MODULE	DESCRIPTION
Four-Port 8Gb/s Fibre Channel Module	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
Four-Port 1 Gb/s iSCSI Module with TOE	iSCSI module with four 1 GBaseT RJ-45 copper connections to Cat 6 cabling to Ethernet switch; includes TCP offload engine
Two-Port 10 Gb/s Opt iSCSI Module with TOE	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
Two-Port 10 GBASE-T iSCSI Module with TOE	iSCSI module with two 10 GBaseT Ethernet ports with copper connection to Ethernet switch; includes TCP offload engine
Two-Port 10 GbE FCoE Module	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
Four-Port 6Gb/s SAS V3.0 Module	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.

ULTRAFLEX IO MODULE OPTIONS (FILE)

Four-Port 1 GBASE-T IP Module	10/100/1000 BaseT module with four ports supporting RJ-45 copper connections to Cat 6 cabling to Ethernet switch
Two-Port 10 GbE Opt IP Module	IP module with two 10 Gb/s Ethernet ports and choice of SFP+ optical connection or active twinax copper connection to Ethernet switch
Two-Port 10 GBASE-T IP Module	IP module with two 10 GBaseT Ethernet ports with copper connection to Ethernet switch
Four-Port 8 Gb/s Fibre Channel Module	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

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)

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)

	15x3.5" Drive DAE	60x3.5" Drive DAE	25x2.5" Drive DAE	120x2.5" Drive DAE
Drive Types Supported	FLASH, SAS and NL-SAS	FLASH, SAS and NL-SAS	FLASH, SAS and NL-SAS	FLASH, SAS and NL-SAS
Drive Mixing	No limitations	No limitations	No limitations	No limitations
Controller Interface	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*
Formatted Capacity (GB)	93.16	186.3	372.5	745.1	1490.4
Supported in 15 drive DAE	√	√	√	√	√
Supported in 25 drive DAE	√	√	√	√	√
Supported in 60 drive DAE	√	√	√	√	√
Supported in 120 Drive DAE	√	√	√	√	√
Interface	6 Gb SAS	6 Gb SAS	6 Gb SAS	6 Gb SAS	12 Gb SAS

NOMINAL POWER CONSUMPTION (WATTS)

Operating Mode	8.5	8.5	8.5	8.5	8.5
Idle Mode	5.5	5.5	5.5	5.5	5.5

* 100GB and 200GB SSDs are available in SLC or eMLC technology. 400GB 800GB and 1.6TB SSD are eMLC technology. eMLC can only be used in FAST VP use cases.

** 520 bytes/sector, 1 MB = 1,048,576 bytes

ROTATING DISK DRIVES

Nominal Capacity	300 GB Drive	300 GB Drive	600 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
Formatted Capacity (GB)	272.59	272.59	545.19	545.19	545.1	833.4	1,117.8	931.51	1,863	2,794	3,726
Supported in 15 drive DAE	√		√		√	√	√		√	√	√
Supported in 60 drive DAE		√		√	√	√	√		√	√	√
Supported in 25 drive DAE		√		√	√	√	√	√			
Supported in 120 Drive DAE		√		√			√				
Rotational Speed	15,000 rpm	15,000 rpm	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
Interface	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	6 Gb SAS	6 Gb SAS
Data Buffer	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	16 MB min	16 MB min

ACCESS TIME

Average Read	3.4 msec	2.8 msec	3.4 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
Average Write	3.9 msec	3.3 msec	3.9 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
Rotation Latency	2.0 msec	2.0 msec	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)

Operating Mode	12.92	9.07	16.35	12.92	5.6	5.6	5.6	7.44	12.2	12.2	12.2
Idle Mode	8.74	5.25	11.68	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) ^{1*}	Link Aggregation (IEEE 802.3ad)	SMI-S v1.6 compatible VNX File client
DFS Distributed File System (Microsoft) as Leaf node or Root Server	Management Port IPv4 and/or IPv6	Simple Network Management Protocol V1-V3 (SNMP)
Ethernet Trunking	Network Data Management Protocol (NDMP) v1-v4	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 Information Service (NIS) Client	UNIX archive utilities (tar/cpio)
FileMover API: Open API for automated, transparent data movement between tiers of the storage network	Network Status Monitor (NSM) v1	Virtual Data Movers for Microsoft Windows clients
Lock Manager (NLM) v1, v3, and v4	Network Time Protocol (NTP) client	Virtual LAN (IEEE 802.1q)

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

VNX SOFTWARE

VNX5200, VNX5400, VNX5600, VNX5800, VNX7600 AND VNX8000

Unisphere™ Management Suite:
Simple, intuitive management, monitoring and troubleshooting for VNX

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)

Protocols

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

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 (Block Use Case)
Block Compression
File Deduplication and Compression
SAN Copy

VNX Software Essentials Pack

Includes:
FAST Suite
VNX Events & Retention Suite
Local Protection Suite
Remote Protection Suite
15 VM licenses for RecoverPoint for Virtual Machines
5 VPLEX-VE Licenses

Encryption

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

Storage Analytics

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

Application Protection

Automate application copies
Self-service application copy management
Includes AppSync™ software

SEPARATE SOFTWARE SUITES:

FAST™ Suite: Automatically optimize for the highest system performance and the lowest storage cost simultaneously

Optimize performance and cost concurrently with:
- Dynamic tiering of data across drives
- Extendable cache for performance boost

VNX Events and Retention Suite: Keep data safe from changes, deletions, and malicious activity

Disk-based WORM functionality
Anti-virus integration and alerting

Local Protection Suite: Practice Safe Data Protection and Repurposing

Block storage snaps and clones
Continuous Data Protection for DVR-like recovery for block storage
File system snaps

Remote Protection Suite: Protect data against localized failures, outages, and disasters

Unified storage replication with DVR-like recovery
Integrated WAN deduplication and bandwidth reduction
Granular file system level replication and recovery

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

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 v6.5 (VSI) for VMware vSphere 2015: For provisioning, management, cloning, deduplication, multi-pathing Policy Setup and VPLEX platform provisioning
- 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


ADDITIONAL OPTIONAL EMC TITLES

- EMC Syncplicity®: File sync and share solution with secure on-premise EMC VNX, Isilon or Atmos Storage
- 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
POWER						
						
		Yes*	Yes*	Yes*	Yes*	
AC Line Current (operating maximum)	4.84A max at 200 Vac 9.86 A max at 100Vac	4.84 A max at 200 Vac 9.86 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	7.25 A max at 200 Vac
Power Consumption (operating maximum)	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	1,450 VA (1,380 W) max 200Vac
Power Factor	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
Heat Dissipation (operating maximum)	3.48 x 10 ⁶ J/hr, (3,300 Btu/hr) max (200V) 3.50 x 10 ⁶ J/hr, (3,313 Btu/hr) max (100V*)	3.48 x 10 ⁶ J/hr, (3,300 Btu/hr) max (200V) 3.50 x 10 ⁶ J/hr, (3,313 Btu/hr) max (100V*)	3.52 x 10 ⁶ J/hr, (3,334 Btu/hr) max (200V) 3.53 x 10 ⁶ J/hr, (3,344 Btu/hr) max (100V*)	3.56 x 10 ⁶ J/hr, (3,371 Btu/hr) max (200V) 3.57 x 10 ⁶ J/hr, (3,388 Btu/hr) max (100V*)	3.64 x 10 ⁶ J/hr, (3,450 Btu/hr) max (200V) 3.65 x 10 ⁶ J/hr, (3,460 Btu/hr) max (100V*)	4.97 x 10 ⁶ J/hr, (4,710 Btu/hr) max
In-rush Current	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
Startup Surge Current	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
AC Protection	15 A fuse on each power supply					
AC Inlet Type	IEC320-C14 appliance coupler, per power zone					
Ride-through Time	10 ms min					12 ms min
Current Sharing	± 5 percent of full load, between power supplies					
DIMENSIONS						
Weight kgs/lbs	empty 41/90.4	empty 41/90.4	empty 41/90.4	empty 41/90.4	empty 41/90.4	empty 50/110
Vertical size	3 NEMA units	3 NEMA units	3 NEMA units	3 NEMA units	3 NEMA units	4 NEMA units
Height cm/inches	13.33/5.25	13.33/5.25	13.33/5.25	13.33/5.25	13.33/5.25	17.78/7.00
Width cm/inches	44.45/17.5	44.45/17.5	44.45/17.5	44.45/17.5	44.45/17.5	44.45/17.5
Depth cm/inches	61.0/24	61.0/24	61.0/24	61.0/24	61.0/24	61.0/24

*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
POWER				
AC Line Current (operating maximum)	2.8 A max at 100 Vac, 1.4 A max at 200 Vac	6.0 A max at 200 Vac	2.8 A max at 100 Vac, 1.4 A max at 200 Vac	8.06 A max at 200 Vac
Power Consumption (operating maximum)	280 VA (235 W) max	1,200 VA (1,210 W) max	280 VA (255 W) max	1611 VA (2160 W) max
Power Factor	0.98 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
Heat Dissipation (operating maximum)	8.46 x 10 ⁵ J/hr, (800 Btu/hr) max	4.07 x 10 ⁶ J/hr, (3,860 Btu/hr) max	9.179 x 10 ⁵ J/hr, (870 Btu/hr) max	5.63 x 10 ⁶ J/hr, (5337 Btu/hr) max
In-rush Current	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	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
Startup Surge Current	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
AC Protection	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
AC Inlet Type	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
Ride-through Time	30 ms min	30 ms min	30 ms min	12 ms min per supply
Current Sharing	± 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
WEIGHTS AND DIMENSIONS				
Weight kg/lbs	Empty: 14.5/32 Full: 30.45/67	Empty: 36.7/81 Full: 96.4/213	Empty: 10.0/22.1 Full: 17.4/38.35	Empty 22.7/50 Full: 58/128
Vertical size	3 NEMA units	4 NEMA units	2 NEMA units	3 NEMA units
Height cm/inches	13.33/5.25	17.78/7.00	8.76/3.45	13.33/5.25
Width cm/inches	44.45/17.5	44.45/17.5	44.45/17.5	44.45/17.5
Depth cm/inches	35.56/14	111.76/44	33.02/13	111.76/ 44

VNX 8000 Standby Power Supply

POWER	2.2KW 2U SPS (Note all ratings assume fully configured systems)
AC Line Voltage	200 to 240 Vac \pm 10%, single-phase, 47 to 63 Hz
AC Line Current, Internal and Pass-through	0.1 A max at 200 Vac, internal power consumption (Up to 11 A max at 200 Vac, pass-through to AC outlets)
Internal Power Consumption	150 VA (135 W) peak in hi-charge mode, 20 VA (12 W) in float charge mode
Power Factor	N/A for pass-through load, internal 10 VA load is 0.60 power factor
Heat Dissipation	43.2 x 10 ³ J/hr, (40 Btu/hr) steady state
In-rush Current	25 A max for ½ line cycle, per power supply at 240 Vac
AC Protection	20 A circuit breaker
AC Inlet Type	IEC320-C14 appliance coupler with switch
AC Outlet Type	IEC320-C13 appliance coupler, quantity four
Charge Times	5.5 hours max
AC Failure Detect Time	12 ms max
Transfer Time	25 ms max
Dimensions (H/W/L)	3.37 in/17.5 in/28 in or 8.56 cm/44.45 cm/71.1 cm
Weight	79 lb/35.9 Kg

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

CABINETS

	STANDARD 40U CABINET	DENSE 40U CABINET
AC Line Voltage	200 to 240 Vac \pm 10%, single-phase, 47 to 63 Hz	200 to 240 Vac \pm 10%, single-phase, 47 to 63 Hz
Power Configuration	Two power domains (base and extended), each redundant	One, two, three or four power domains, each redundant
Power Inlet Count	Either two (for redundant base configuration) or four (for redundant extended configuration)	Two, four, six, or eight (two per domain)
Plug Types	NEMA L6-30P or IEC309-332 P6 or IP57 (Australia)	NEMA L6-30P or IEC309-332 P6 or IP57 (Australia)
Input Power Capacity	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
AC Protection	30 A site circuit breakers on each power branch	30A site circuit breakers on each power branch (8 max)
40U Cabinet Dimensions	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
POWER							
AC Line Voltage	100 to 240 Vac± 10%, single-phase, 47 to 63 Hz						
AC Line Current (operating maximum)	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
Power Consumption (operating maximum)	530 VA (500 W) max						100 VA (90 W) max
Power Factor	0.98 min at full load, low voltage						0.90 min at full load, low voltage
Heat Dissipation (operating maximum)	1.80 x 10 ⁶ J/hr, (1,710 Btu/hr) max						3.24 x 10 ⁵ J/hr, (310 Btu/hr) max
In-rush Current	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						
Startup Surge Current	27 A rms max for 50 ms, at any line voltage						NA
AC Protection	7.8 A fuse on each power supply, both phases						NA
AC Inlet Type	IEC320-C14 appliance coupler, per power zone						
Ride-through Time	30 ms min						NA
Current Sharing	± 15 percent of full load, between power supplies						NA
DIMENSIONS							
Weight	23.8 kg (52.5 lb)						10.5kg (23.3 lb)
Vertical size	2 NEMA units						1 NEMA unit
Height	8.89 cm (3.50 in)						4.45 cm (1.75 in)
Width	44.45 cm (17.50 in)						43.8 cm (17.25 in)
Depth	61.0 cm (24.0 in)						55.37 cm (21.8in)

OPERATING ENVIRONMENT (MEETS ASHRAE EQUIPMENT CLASS A3)

Recommended Range Operation	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
Continuous Allowable Range Operation	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).
Expanded Allowable Range Operation	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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REDEFINE

SPECIFICATION SHEET

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