

# 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-5600 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 X-blade data movers and block (iSCSI, FCoE, and FC) storage via dual storage processors leveraging full 6 Gb SAS disk drive topology. The unified configuration includes the following rack-mounted enclosures:

- Disk processor enclosure (holds disk drives) or storage processor enclosure (requires disk drive tray) plus standby power system to deliver block protocols
- One or more data mover enclosures to deliver file protocols (required for file and unified configurations)
- Control station (required for file and unified configurations)



## VNX PHYSICAL SPECIFICATIONS

BLOCK COMPONENTS	VNX5100	VNX5300	VNX5500	VNX5700	VNX7500
<b>Min/Max Drives</b>	4/75	4/125	4/250	4/500	4/1000
<b>Array Enclosure</b>	3U Disk Processor Enclosure (Holds 15x3.5" or 25x2.5" SAS/Flash drives)	3U Disk Processor Enclosure (Holds 15x3.5" or 25x2.5" SAS/Flash drives)	3U Disk Processor Enclosure (Holds 15x3.5" or 25x2.5" SAS/Flash drives)	2U Storage Processor Enclosure (No drives)	2U Storage Processor Enclosure (No drives)
<b>Drive Enclosure Options (DAE)</b>	25x2.5" SAS/Flash drives-2 U 15x3.5" SAS/Flash drives-3 U	25x2.5" SAS/Flash drives-2 U 15x3.5" SAS/Flash drives-3 U	25 x 2.5" SAS / Flash drives-2 U 15 x 3.5" SAS / Flash drives-3 U 60 x 3.5" SAS/Flash drives-4U*	25x2.5" SAS/Flash drives-2 U 15x3.5" SAS/Flash drives-3 U 60x3.5" SAS/Flash drives-4U*	25x2.5" SAS/Flash drives-2 U 15x3.5" SAS/Flash drives-3 U 60x3.5" SAS/Flash drives-4U*
<b>Standby Power System</b>	1U 1.2KW	1U 1.2KW	1U 1.2KW**	1U 1.2KW**	1U 1.2KW**
<b>Raid Options</b>	0/1/10/3/5/6	0/1/10/3/5/6	0/1/10/3/5/6	0/1/10/3/5/6	0/1/10/3/5/6
<b>CPU/Memory per Array</b>	Intel Xeon 5600 /8 GB	Intel Xeon 5600 /16 GB	Intel Xeon 5600 /24 GB	Intel Xeon 5600 /36 GB	Intel Xeon 5600 /48 GB
<b>Max Block UltraFlex™ IO Modules per Array</b>	0	4	4	10	10
<b>Embedded IO Ports per Array</b>	8 FC ports and 4 SAS ports (2 BE SAS buses)	8 FC ports and 4 SAS ports (2 BE SAS buses)***	8 FC ports and 4 SAS ports (2 BE SAS buses)***	0	0
<b>Max Total Ports per Array</b>	8	24	24	24	32
<b>2/4/8 Gb/s FC Max Ports per Array</b>	8	16	16	24	32
<b>1 GBaseT iSCSI Max Total Ports per Array</b>	N/A	8	16	16	16
<b>10 GbE iSCSI Max Total Ports per Array</b>	N/A	8	8	12	12
<b>Max FCoE Total Ports per Array</b>	N/A	8	8	12	16
<b>6 Gb/s SAS Buses (4 Lanes per Bus) for DAE Connections</b>	2	2	2 or 6 (6 if high bandwidth option is required)	4	4 or 8 (consumes 2 or 4 UltraFlex IO modules per array)
<b>FILE COMPONENTS****</b>					
<b># File X-Blades</b>	N/A	1-2	1-3	2-4	2-8
<b># Control Stations</b>	N/A	1-2 x 1U Server	1-2 x 1U Server	1-2 x 1U Server	1-2 x 1U Server
<b>X-Blade: CPU/Memory</b>	N/A	Intel Xeon 5600 / 6 GB	Intel Xeon 5600 / 12 GB	Intel Xeon 5600 / 12 GB	Intel Xeon 5600 / 24 GB
<b>Max File UltraFlex IO Modules per X-Blade</b>	N/A	3	4	4	5
<b>Min/Max 2/4/8 Gb/s FC Ports per X-Blade</b>	N/A	4	4	4	4
<b>Max IP Ports per X-Blade</b>	N/A	8	12	12	16
<b>Max 1 GBaseT Ports per X-Blade</b>	N/A	8	12	12	16
<b>Max 10 GbE Ports per X-Blade</b>	N/A	4	6	6	8
<b>OTHER</b>					
<b>Management</b>	LAN 2x 10/100/1000 Copper GbE	LAN 2x 10/100/1000 Copper GbE	LAN 2x 10/100/1000 Copper GbE	LAN 2x 10/100/1000 Copper GbE	LAN 2x 10/100/1000 Copper GbE

FUNCTIONAL LIMITS	VNX5100	VNX5300	VNX5300	VNX5700	VNX7500
<b>Max Raw Capacity</b>	225 TB	360 TB	720 TB	1,485 TB	2,970 TB
<b>Max SAN Hosts</b>	512	2,048	4,096	4,096	8,192
<b>Max Number of Pools</b>	10	20	40	40	60
<b>Max Number of LUNs</b>	512	2,048	4,096	4,096	8,192
<b>Max LUN Size</b>	16 TB (Virtual Pool LUN)	16 TB (Virtual Pool LUN)	16 TB (Virtual Pool LUN)	16 TB (Virtual Pool LUN)	16 TB (Virtual Pool LUN)
<b>Max File System Size</b>	N/A	16 TB	16 TB	16 TB	16 TB
<b>Maximum Usable File Capacity per X-Blade</b>	N/A	256 TB	256 TB	256 TB	256 TB
<b>OS Support</b>	Block OS's see EMC E-Lab™ Navigator on EMC Powerlink™	Block OS's Plus File OS's see E-Lab Navigator and NAS Support Matrix on Powerlink	Block OS's Plus File OS's see E-Lab Navigator and NAS Support Matrix on Powerlink	Block OS's Plus File OS's see E-Lab Navigator and NAS Support Matrix on Powerlink	Block OS's Plus File OS's see E-Lab Navigator and NAS Support Matrix on Powerlink

\* 60-Drive 4U DAE is a top-loading DAE and requires a high-density EMC rack.

\*\* If using 60-Disk 4U DAE as Vault DAE, dual SPS (2U 2.2KW) is required.

\*\*\* 4 embedded FC ports per array are reserved for file connectivity.

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

## VNX CONNECTIVITY

The VNX series provides flexible connectivity options via UltraFlex IO modules for both the file X-blades 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
<b>Four-Port 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 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 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

### ULTRAFLEX IO MODULE OPTIONS (FILE)

IO Module	Description
<b>Four-Port 1 GBaseT IP Module</b>	10/100/1000 BaseT module with four ports supporting RJ-45 copper connections to Cat 6 cabling to Ethernet switch
<b>Four-Port 1 GBaseT and 1 GbE Opt IP Module</b>	IP module with two ports of 10/100/1000 BaseT and two ports 1 GbE optical
<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>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

## MAXIMUM CABLE LENGTHS

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

Shortwave optical OM3: 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 or four (or optionally eight for the VNX7500) 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 a minimum of four "vault" drives (SAS or Near-line SAS) and support a maximum of 1000 disk drives in up to 67 disk expansion chassis.

Approximately 200 GB per vault drive is consumed by VNX operating environment software and data structures.

### DISK ARRAY ENCLOSURES

	15x3.5" Drive DAE	60x3.5" Drive DAE	25x2.5" Drive DAE
<b>Drive Types Supported</b>	3.5" Flash 3.5" 15K Rotating 2.5" 10K Rotating (in 3.5" carrier) 3.5" Near-line Rotating	3.5" Flash 2.5" 10K Rotating (in 3.5" carrier) 3.5" Near-line Rotating	2.5" Flash 2.5" 10K Rotating
<b>Drive Mixing</b>	No limitations	No limitations	No limitations
<b>Controller Interface</b>	6 Gb SAS	6 Gb SAS	6 Gb SAS

### DISK DRIVES FOR 15X3.5" AND 60X3.5" DRIVE DISK PROCESSOR ENCLOSURE/DISK ARRAY ENCLOSURE

Nominal Capacity	100 GB Solid State Drive	200 GB Solid State Drive	300 GB 15K Drive	600 GB 15K Drive	300 GB 10K Drive	600 GB 10K Drive	900 GB 10K Drive	1 TB 7.2K Drive	2 TB 7.2K Drive	3 TB 7.2K Drive
<b>Supported in 15 drive DAE</b>	√	√	√	√	√	√	√	√	√	√
<b>Supported in 60 drive DAE</b>	√	√				√	√	√	√	√
<b>Formatted Capacity*</b>	93.1 GB	186.31 GB	272.59 GB	545.19 GB	272.59 GB	545.19 GB	833.4 GB	926.04 GB	1,852.09 GB	2794.5 GB
<b>Drive Form Factor</b>	3.5"	3.5"	3.5"	3.5"	2.5"	2.5"	2.5"	3.5"	3.5"	3.5"
<b>Height</b>	1.0"	1.0"	1.0"	1.0"	1.0"	1.0"	1.0"	1.0"	1.0"	1.0"
<b>Rotational Speed</b>	Solid State	Solid State	15,000 rpm	15,000 rpm	10,000 rpm	10,000 rpm	10,000 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	6 Gb SAS
<b>Data Buffer</b>	N/A SSD	N/A SSD	16 MB min	16 MB min	16 MB min	16 MB min	16 MB min	16 MB min	16 MB min	16 MB min
<b>ACCESS TIME</b>										
<b>Average Read</b>	N/A	N/A	3.4 msec	3.4 msec	3.6 msec	3.7 msec	3.7 msec	8.5 msec	8.5 msec	8.5 msec
<b>Average Write</b>	N/A	N/A	3.9 msec	3.9 msec	4.2 msec	4.2 msec	4.2 msec	9.5 msec	9.5 msec	9.5 msec
<b>Rotation Latency</b>	N/A	N/A	2.0 msec	2.0 msec	3.0 msec	3.0 msec	3.0 msec	4.16 msec	4.16 msec	4.16 msec
<b>NOMINAL POWER CONSUMPTION (WATTS)</b>										
<b>Operating Mode</b>	4.97	4.97	12.92	16.35	6.15	5.6	5.6	12.2	12.2	12.2
<b>Idle Mode</b>	1.36	1.36	8.74	11.68	3.5	3.1	3.1	8.0	8.0	8.0

## DISK DRIVES FOR 25X2.5" DRIVE DISK PROCESSOR ENCLOSURE/DISKARRAY ENCLOSURE

<b>Nominal Capacity</b>	<b>100 GB Solid State Drive</b>	<b>200 GB Solid State Drive</b>	<b>300 GB 10K Drive</b>	<b>600 GB 10K Drive</b>	<b>900 GB 10K Drive</b>
<b>Formatted Capacity*</b>	93.1 GB	186.31 GB	272.59 GB	545.19 GB	833.4 GB
<b>Form Factor</b>	2.5"	2.5"	2.5"	2.5"	2.5"
<b>Height</b>	1.0"	1.0"	1.0"	1.0"	1.0"
<b>Rotational Speed</b>	Solid State	Solid State	10,000 rpm	10,000 rpm	10,000 rpm
<b>Interface</b>	6 Gb SAS	6 Gb SAS	6 Gb SAS	6 Gb SAS	6 Gb SAS
<b>Data Buffer</b>	N/A SSD	N/A SSD	16 MB min	16 MB min	16 MB min
<b>ACCESS TIME</b>					
<b>Average Read</b>	N/A	N/A	3.6 msec	3.6 msec	3.6 msec
<b>Average Write</b>	N/A	N/A	4.2 msec	4.2 msec	4.2 msec
<b>Rotation Latency</b>	N/A	N/A	3.0 msec	3.0 msec	3.0 msec
<b>NOMINAL POWER CONSUMPTION (WATTS)</b>					
<b>Operating Mode</b>	4.97	4.97	6.15	5.6	5.6
<b>Idle Mode</b>	1.36	1.36	3.5	3.1	3.1

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

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## VNX OE PROTOCOLS AND SOFTWARE FACILITIES

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

### PROTOCOLS AND FACILITIES SUPPORTED

- Access-based Enumeration (ABE) for Microsoft Windows® Server 2003
- Address Resolution Protocol (ARP)
- Automated Volume Management (AVM): file system provisioning
- Block Protocols: iSCSI, Fibre Channel (FCP SCSI-3), and FCoE
- Common Criteria Certification: EAL 3+ Assurance Level
- DFS Distributed File System (Microsoft) as Leaf node or Root Server
- Ethernet Trunking
- File Protocols: NFSv2, v3, and v4; CIFS (SMB 1 and SMB 2); FTP (including SFTP and FTPs)
- FileMover API: Open API for automated, transparent data movement between tiers of the storage network
- Lock Manager (NLM) v1, v3, and v4
- Failsafe Networking
- Internet Control Message Protocol (ICMP)
- Kerberos Authentication
- Lightweight Directory Access Protocol (LDAP)

- LDAP signing for Windows
- Link Aggregation (IEEE 802.3ad)
- UNIX archive utilities (tar/cpio)
- Network Data Management Protocol (NDMP) v1-v4
- Network Equipment-Building System (NEBS) Level 3/ETSI Certified
- Network Information Service (NIS) Client
- Network Status Monitor (NSM) v1
- Object support via EMC Atmos™ Virtual Edition
- Portmapper v2
- Network Time Protocol (NTP) client
- NT LAN Manager (NTLM)
- Restriction of Hazardous Substances (RoHS) compliance
- Routing Information Protocol (RIP) v1-v2
- Simple Network Management Protocol V1-V3 (SNMP)
- Simple Network Time Protocol (SNTP)
- Virtual Data Movers for Microsoft Windows clients
- Virtual LAN (IEEE 802.1q)

## VNX SOFTWARE

	VNX5100	VNX5300, VNX5500, VNX5700, AND VNX7500
<b>Management</b>	Unisphere™ for Block	Unisphere for Block, Unisphere for File, or Unisphere for Unified
<b>Protocols</b>	FC included	CIFS, NFS, pNFS, MPFS, FC, FCoE, iSCSI included
<b>Base Software (included with VNX OE)</b>	EMC Virtual Provisioning™	File Single Instancing Compression Virtual Provisioning

## SOFTWARE SUITES

<b>FAST Suite:</b> Automatically optimize for the highest system performance and the lowest storage cost simultaneously	Extendable cache for performance boost Trend analysis and reporting Monitor and achieve performance objectives	Dynamically tier data across drives Extendable cache for performance boost Trend analysis and reporting Monitor and achieve performance objectives
<b>Security and Compliance Suite:</b> Keep data safe from changes, deletions, and malicious activity	Encrypt data where it is created	Encrypt data where it is created Disk-based WORM functionality Anti-virus integration and alerting
<b>Local Protection Suite:</b> Practice Safe Data Protection and Repurposing	Block storage snaps and clones Continuous Data Protection for DVR-like recovery for block storage	Block storage snaps and clones Continuous Data Protection for DVR-like recovery for block storage File system snaps

	VNX5100	VNX5300, VNX5500, VNX5700, AND VNX7500
<b>Remote Protection Suite:</b> Protect data against localized failures, outages, and disasters	Unified storage replication with DVR-like recovery Integrated WAN deduplication and bandwidth reduction	Unified storage replication with DVR-like recovery Integrated WAN deduplication and bandwidth reduction Granular file system level replication and recovery
<b>Application Protection Suite:</b> Automate application copies and prove compliance	Application copy management Prove protection compliance	Application copy management Prove protection compliance
<b>SOFTWARE PACKS</b>		
<b>Protection Pack</b>	Local Protection Suite + Remote Protection Suite + Application Protection Suite	Local Protection Suite + Remote Protection Suite + Application Protection Suite
<b>Total Value Pack</b>	Security & Compliance Suite+ Local Protection Suite + Remote Protection Suite + Application Protection Suite	N/A
<b>Total Efficiency Pack</b>	N/A	FAST Suite + Security & Compliance Suite+ Local Protection Suite + Remote Protection Suite + Application Protection Suite

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

## OPTIONAL VMWARE FACILITIES AND TITLES

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

- VNX Plug-in for VMware®: For provisioning, management, cloning, and deduplication
- Site Recovery Manager (SRM) Integration: Managing failover and failback making disaster recovery rapid and reliable
- Replication Manager: Host-based management of array-based copies of data

## ADDITIONAL OPTIONAL EMC TITLES

- EMC Ionix™: VNX integration with EMC Storage management infrastructure
- EMC PowerPath®: path management
- EMC File Management Appliance (FMA and FMA/VE): policy-based file archiving

## VNX ELECTRICAL SPECIFICATIONS

(For specific power specifications please refer to the EMC Power Calculator at [power.emc.com](http://power.emc.com) with your Powerlink account.)





	<b>VNX5100 DPE (15x3.5" drives)</b>	<b>VNX5100 DPE (25x2.5" drives)</b>	<b>VNX5300 DPE (15x3.5" drives)</b>	<b>VNX5300 DPE (25x2.5" drives)</b>	<b>VNX5500 DPE (15x3.5" drives)</b>	<b>VNX5500 DPE (25x2.5" drives)</b>	<b>VNX5700 SPE</b>	<b>VNX7500 SPE</b>
<b>DIMENSIONS</b>								
<b>Height (in/cm)</b>	5.25 in/ 13.34 cm#	5.25 in/ 13.34 cm#	5.25 in/ 13.34 cm#	5.25 in/ 13.34 cm#	5.25 in/ 13.34 cm#	5.25 in/ 13.34 cm#	3.5 in/ 8.9 cm#	3.5 in/ 8.9 cm#
<b>Width (in/cm)</b>	17.5 in/ 44.45 cm	17.5 in/ 44.45 cm	17.5 in/ 44.45 cm	17.5 in/ 44.45 cm	17.5 in/ 44.45 cm	17.5 in/ 44.45 cm	17.5 in/ 44.45 cm	17.5 in/ 44.45 cm
<b>Depth (in/cm)</b>	24.25 in/ 61.6 cm	24.25 in/ 61.6 cm	24.25 in/ 61.6 cm	24.25 in/ 61.6 cm	24.25 in/ 61.6 cm	24.25 in/ 61.6 cm	24.25 in/ 61.6 cm	24.25 in/ 61.6 cm
<b>Weight (lb/kg) (with and without drives)</b>	Full: 96.8/44.0 Empty: 61.8/28.1	Full: 75.25/34.2 Empty: 59.0/26.8	Full: 96.8/44.0 Empty: 61.8/28.1	Full: 75.25/34.2 Empty: 59.0/26.8	Full: 96.8/44.0 Empty: 61.8/28.1	Full: 75.25/34.2 Empty: 59.0/26.8	52.5 lb/ 23.81 kg	52.5 lb/ 23.81 kg

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

#### STANDBY POWER SUPPLY

<b>POWER</b>	<b>1.2kW Standby Power Supply</b>	<b>2.2KW 2U SPS (Note all ratings assume fully configured systems)</b>
<b>AC Line Voltage</b>	100 to 240 Vac ± 10%, single-phase, 47 to 63 Hz	100 to 240 Vac ± 10%, single-phase, 47 to 63 Hz
<b>AC Line Current, Internal and Pass-through</b>	0.10 A max at 100 Vac, internal power consumption (Up to 10 A max at 100 Vac, pass-through to AC outlets) 0.05 A max at 200 Vac, internal power consumption (Up to 6 A max at 200 Vac, pass-through to AC outlets)	0.1 A max at 200 Vac, internal power consumption (Up to 11 A max at 200 Vac, pass-through to AC outlets)
<b>Internal Power Consumption</b>	70 VA (40 W) pk in hi-charge mode, 10 VA (6 W) in float charge mode	150 VA (135 W) pk 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	N/A for pass-through load, internal 10 VA load is 0.60 power factor
<b>Heat Dissipation</b>	21.6 x 10 <sup>3</sup> J/hr, (20 Btu/hr) steady state	43.2 x 10 <sup>3</sup> J/hr, (40 Btu/hr) steady state
<b>In-rush Current</b>	9 A max for ½ line cycle, per power supply at 240 Vac	25 A max for ½ line cycle, per power supply at 240 Vac
<b>AC Protection</b>	15 A fuse, both phases	20 A circuit breaker
<b>AC Inlet Type</b>	IEC320-C14 appliance coupler with switch	IEC320-C14 appliance coupler with switch
<b>AC Outlet Type</b>	IEC320-C13 appliance coupler, quantity two	IEC320-C13 appliance coupler, quantity four
<b>Charge Times</b>	190 minutes max	5.5 hours max
<b>AC Failure Detect Time</b>	10 ms max	12 ms max
<b>Transfer Time</b>	25 ms max	25 ms max
<b>Dimensions (H/W/L)</b>	1.6 in/17.5 in/23.75 in or 4.0 cm/44.45 cm/60.3 cm	3.37 in/17.5 in/28 in or 8.56 cm/44.45 cm/71.1 cm
<b>Weight</b>	47 lb/21.6 Kg	79 lb/35.9 Kg

**DATA MOVER ENCLOSURES, DISK ARRAY ENCLOSURES AND CONTROL STATION**

	<b>VNX5300 DME with (2) Data Movers</b>	<b>VNX5500 DME with (2) Data Movers</b>	<b>VNX5700 DME with (2) Data Movers</b>	<b>VNX7500 DME with (2) Data Movers</b>	<b>15x3.5" Disk Array Enclosure*</b>	<b>60x3.5" Disk Array Enclosure*</b>	<b>25x2.5" Disk Array Enclosure*</b>	<b>Control Station</b>
<b>POWER</b>								
<b>AC Line Voltage</b>	100 to 240 Vac± 10%, single-phase, 47 to 63 Hz	100 to 240 Vac± 10%, single-phase, 47 to 63 Hz	100 to 240 Vac± 10%, single-phase, 47 to 63 Hz	100 to 240 Vac± 10%, single-phase, 47 to 63 Hz	100 to 240 Vac± 10%, single-phase, 47 to 63 Hz	100 to 240 Vac± 10%, single-phase, 47 to 63 Hz	100 to 240 Vac± 10%, single-phase, 47 to 63 Hz	100 to 240 Vac± 10%, single-phase, 47 to 63 Hz
<b>AC Line Current (operating maximum)</b>	4.7 A max at 100 Vac, 2.3 A max at 200 Vac	5.0 A max at 100 Vac, 2.5 A max at 200 Vac	5.3 A max at 100 Vac, 2.7 A max at 200 Vac	5.3 A max at 100 Vac, 2.7 A max at 200 Vac	2.8 A max at 100 Vac, 1.4 A max at 200 Vac	12.0 A max at 100 Vac, 6.0 A max at 200 Vac	2.5 A max at 100 Vac, 1.3 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>	415 VA (390 W) max	500 VA (470 W) max	530 VA (500 W) max	530 VA (500 W) max	280 VA (235 W) max	1,200 VA (1,130 W) max	250 VA (230 W) max	132 VA (104 W) max
<b>Power Factor</b>	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	0.98 min at full load, low voltage	0.98 min at full load, low voltage	0.98 min at full load, low voltage	0.80 min at full load, low voltage
<b>Heat Dissipation (operating maximum)</b>	1.58 x 10 <sup>6</sup> J/hr, (1,500 Btu/hr) max	1.69 x 10 <sup>6</sup> J/hr, (1,610 Btu/hr) max	1.80 x 10 <sup>6</sup> J/hr, (1,710 Btu/hr) max	1.80 x 10 <sup>6</sup> J/hr, (1,710 Btu/hr) max	8.46 x 10 <sup>5</sup> J/hr, (800 Btu/hr) max	4.07 x 10 <sup>6</sup> J/hr, (3,860 Btu/hr) max	8.28 x 10 <sup>5</sup> J/hr, (785 Btu/hr) max	3.60 x 10 <sup>5</sup> J/hr, (300 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	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	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	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	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	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	27 A rms max for 50 ms, at any line voltage	27 A rms max for 50 ms, at any line voltage	27 A rms max for 50 ms, at any line voltage	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	N/A
<b>AC Protection</b>	7.8 A fuse on each power supply, both phases	7.8 A fuse on each power supply, both phases	7.8 A fuse on each power supply, both phases	7.8 A fuse on each power supply, both phases	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	N/A
<b>AC Inlet Type</b>	IEC320-C14 appliance coupler, per power zone	IEC320-C14 appliance coupler, per power zone	IEC320-C14 appliance coupler, per power zone	IEC320-C14 appliance coupler, per power zone	IEC320-C14 appliance coupler, per power zone	IEC320-C14 appliance coupler, two per power zone	IEC320-C14 appliance coupler, per power zone	IEC320-C14 appliance coupler, per power zone
<b>Ride-through Time</b>	30 ms min	30 ms min	30 ms min	30 ms min	30 ms min	30 ms min	30 ms min	N/A
<b>Current Sharing</b>	± 15 percent of full load, between power supplies	± 15 percent of full load, between power supplies	± 15 percent of full load, between power supplies	± 15 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	N/A
<b>DIMENSIONS</b>								
<b>Height (in/cm)</b>	3.5 in/ 8.9 cm	3.5 in/ 8.9 cm	3.5 in/ 8.9 cm	3.5 in/ 8.9 cm	5.25 in/ 13.34 cm	7 in/ 17.8 cm	3.45 in/ 8.76 cm	1.75 in/ 4.45 cm
<b>Width (in/cm)</b>	17.5 in/ 44.45 cm	17.5 in/ 44.45 cm	17.5 in/ 44.45 cm	17.5 in/ 44.45 cm	17.62 in/ 44.75 cm	17.62 in/ 44.75 cm	17.62 in/ 44.75 cm	17.5 in/ 44.45 cm
<b>Depth (in/cm)</b>	24.25 in/ 61.6 cm	24.25 in/ 61.6 cm	24.25 in/ 61.6 cm	24.25 in/ 61.6 cm	14 in/35.56 cm	35 in + cable mgmt. arm (needs 44 in deep rack)	13 in/33.02 cm	20 in/50.8 cm
<b>Weight (lb/kg) (with and without drives)</b>	52.5 lb/ 23.81 kg	52.5 lb/ 23.81 kg	52.5 lb/ 23.81 kg	52.5 lb/ 23.81 kg	Full: 67/30.45 Empty: 32/14.5	Full: 213/96.4 Empty: 81/36.7	Full: 38.35/17.4 Empty: 22.1/10.0	18 lb/ 8.16 kg

\*Ratings assume a fully loaded DAE that includes two power supplies, two LCCs, and 15/25/60 disk drives.

	<b>Standard 40U Cabinet</b>	<b>Dense 40U Cabinet</b>
<b>AC Line Voltage</b>	200 to 240 Vac ± 10%, single-phase, 47 to 63 Hz	200 to 240 Vac ± 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)

## OPERATING ENVIRONMENT

<b>Temperature:</b>	50–104 degrees F (10–40 degrees C)
<b>Temperature Gradient:</b>	18 degrees F/hr (10 degrees C/hr)
<b>Relative Humidity:</b>	20% to 80% (non-condensing)
<b>Altitude:</b>	7,500 ft. (2,286.4 m) @ 104 degrees F (40 degrees C) max 10,000 ft (3,048 m) @ 98.6 degrees F (37 degrees C) max

## CONTACT US

To learn more about how EMC products, services, and solutions can help solve your business and IT challenges, [contact](#) your local representative or authorized reseller—or visit us at [www.EMC.com](http://www.EMC.com).

## 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

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