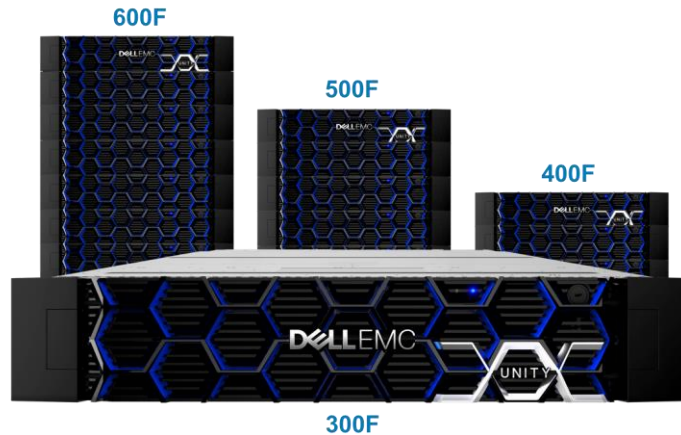# DELL EMC

DELL EMC UNITY ALL FLASH STORAGE 300F,400F, 500F, 600F

THE ULTIMATE IN STORAGE SIMPLICITY & VALUE

The Dell EMC Unity™ All-Flash product line sets new standards for storage with compelling simplicity, modern design, flexible deployments and affordable prices– to meet the needs of resource-constrained IT professionals in large or small companies.

If you are looking for raw power and absolute simplicity in a small footprint, if you are cost-conscious and need the best from the best, Dell EMC Unity All-Flash is for you. Designed for flash with all-inclusive software, it delivers consistent performance with low response times.

Specifications

ARCHITECTURE

Based on the powerful new family of Intel E5-2600 processors, Dell EMC Unity All Flash storage systems implement an integrated architecture for block, file, and VMware VVols with concurrent support for native NAS, iSCSI, and Fibre Channel protocols. Each system leverages dual storage processors, full 12 Gb SAS back end connectivity and Dell EMC's patented multicore architected operating environment to deliver unparalleled performance & efficiency. Additional storage capacity is added via Disk Array Enclosures (DAEs).

PHYSICAL SPECIFICATIONS

	300F	400F	500F	600F
Min/Max Drives	6/150	6/250	6/500	6/1000
Array Enclosure	A 2U Disk Processor Enclosure (DPE) with twenty five 2.5" drives			
Drive Enclosure (DAE - Disk Array Enclosure)	All models support 2U twenty five drive and 3U eighty drive trays for 2.5" drives			
Standby Power System	Dell EMC Unity systems are powered by 2 power supplies (PS) per DPE/DAE. Each power supply can provide power to the entire module if the peer PS has been removed or is faulted. DPE power during a power failure is provided by a Battery Back Up (BBU) module. BBU is located within the SP enclosure and provides power to a single module (power zone)			

	300F	400F	500F	600F
RAID Options	1/0, 5, 6			
CPU per Array	2 x Intel 6-core, 1.6GHz	2 x Intel 8-core, 2.4GHz	2 x Intel 10-core, 2.6GHz	2 x Intel 12-core, 2.5GHz
Memory per Array	48 GB	96 GB	128 GB	256 GB
Max IO Modules per Array*	4	4	4	4
Embedded SAS IO Ports per Array	4 x 4 lane 12Gb/s SAS ports for BE (back end) Connection	4 x 4 lane 12Gb/s SAS ports for BE Connection	4 x 4 lane 12Gb/s SAS ports for BE Connection	4 x 4 lane 12Gb/s SAS ports for BE Connection
Optional SAS IO ports per Array	NA	NA	8 x 4 lane or 4 x 8 lane 12Gb/s SAS ports (for BE Connection	8 x 4 lane or 4 x 8 lane 12Gb/s SAS ports (for BE Connection
Base 12 Gb/s SAS BE Buses per Array	2 x 4 Lane	2 x 4 Lane	2 x 4 Lane	2 x 4 Lane
Max 12 Gb/s SAS BE Buses per Array	2 x 4 Lane	2 x 4 Lane	6 x 4 Lane; or 2 x 4 lane and 2 x 8 lane	6 x 4 Lane; or 2 x 4 lane and 2 x 8 lane
Max FE (front end) Total Ports per Array (all types)	24	24	24	24
Max Initiators per Array	1,024	2,048	2,048	4,096
Max FC Ports per Array	20	20	20	20
Embedded 10GbaseT Ports per Array	4	4	4	4
Embedded CNA ports per Array	4 ports: 8/16 Gb FC**, 10Gb IP/iSCSI, or 1Gb RJ45	4 ports: 8/16 Gb FC**, 10Gb IP/iSCSI, or 1Gb RJ45	4 ports: 8/16 Gb FC**, 10Gb IP/iSCSI, or 1Gb RJ45	4 ports: 8/16 Gb FC**, 10Gb IP/iSCSI, or 1Gb RJ45
1 GbaseT/iSCSI Max Total Ports per Array	24	24	24	24
10 GbE/iSCSI Max Total Ports per Array	24	24	24	24
Max Raw Capacity***	2.34 PBs	3.9 PBs	7.8 PBs	9.7 PBs
Max SAN Hosts	512	1,024	1,024	2,048
Max Number of Pools	20	30	40	100
Max Number of LUNs per Array	1,000	1,500	2,000	6,000
Max LUN Size	256 TB	256 TB	256 TB	256 TB
Max file systems per Array	500	750	1000	1500
Max File System Size	256 TB	256 TB	256 TB	256 TB
Max attached snapshots per Array (Block)	1000	1500	2000	6000
IOPS****	Up to 125K	Up to 260K	Up to 310K	Up to 390K
OS Support	See EMC Simple Support Matrix on emc.com			

* Two IO Modules per Storage Processor (SP), mirrored.
** 16Gb available in both single mode and multimode.
*** Maximum raw capacity will vary based on drive sizes available at time of purchase.
**** 100% Reads, 8K block size

CONNECTIVITY

The Dell EMC Unity series provides flexible connectivity options via IO modules for both the file for NFS/SMB connectivity and the block storage for FC and iSCSI host connectivity (see above table for number of modules supported per SP).

IO MODULE OPTIONS

IO MODULE	DESCRIPTION
Four-Port 16 Gb/s Fibre Channel Module (Block only)	Four port FC module with four ports auto-negotiating to 4/8/16 Gbps; uses single mode or multimode optical SFP and OM2/OM3/OM4 cabling to connect directly to host HBA or FC switch
Four-Port 1 GBASE-T Module (File & Block)	Four port 1GbaseT for IP/iSCSI module with four 1 GBaseT RJ-45 copper connections to Cat 5/6 cabling to Ethernet switch
Four-Port 10 GBASE-T Module (File & Block)	Four port 10GbaseT Ethernet IP/iSCSI module with four 10 GBaseT Ethernet ports with copper connection to Ethernet switch
Two-Port 10 Gb/s Optical Module (File & Block)	Two port 10GbE IP/iSCSI module with choice of SFP+ optical connection or active/passive twinax copper connection to Ethernet switch; includes iSCSI offload engine
Four-Port 10 Gb/s Optical Module (File & Block)	Four port 10GbE IP/iSCSI module with choice of SFP+ optical connection or active/pas twinax copper connection to Ethernet switch
Four-Port 12 Gb/s SAS V3.0 Module*	Four port SAS module, used for back-end storage (DAE) connectivity to Block Storage Processors. Each SAS port has 4 lanes/port @ 12Gbps, delivering 48Gbps nominal throughput. Also available specifically for the 80 drive DAE is 8 lane connectivity utilizing a pair of SAS ports to deliver high bandwidth for added performance.

*Only for 500 and 600 models

MAXIMUM CABLE LENGTHS

Shortwave optical OM3: 100 meters (16 Gb) 150 meters (8 Gb), 380 meters (4 Gb), and 500 meters (2 Gb)
Shortwave optical OM4: 125 meters (16 Gb) 190 meters (8 Gb), 400 meters (4 Gb), and 500 meters (2 Gb)

BACK-END (DRIVE) CONNECTIVITY

Each storage processor connects to one side of each of two redundant pairs of four-lane x 12 Gb/s Serial Attached SCSI (SAS) buses, providing continuous drive access to hosts in the event of a storage processor or bus fault. All models require four "system" drives and support a platform specific maximum number of disks (see Physical Specifications table above). 107 GB per system drive is consumed by the Dell EMC Unity operating environment software and data structures

DISK ARRAY ENCLOSURES (DAE)

	25 x 2.5" Drive DAE	80 x 2.5" Drive DAE
Drive Types Supported	FLASH	FLASH
Controller Interface	12 Gb SAS	12 Gb SAS

SOLID STATE DISK DRIVES

	400 GB SSD	800 GB SSD	1.6 TB SSD	3.2TB SSD	3.84TB SSD	7.68TB SSD	15.36TB SSD
Nominal Capacity							
Formatted Capacity (GB)*	366.7	733.5	1467.45	2919.9	3503.9	7006.9	14014.9
Supported in 25 drive DAE/DPE and 80 drive DAE	√	√	√	√	√	√	√
Interface				12 Gb SAS			

NOMINAL POWER CONSUMPTION (WATTS)

	400 GB SSD	800 GB SSD	1.6 TB SSD	3.2TB SSD	3.84TB SSD	7.68TB SSD	15.36TB SSD
Operating Mode	4.25	4.25	4.25	4.25	4.25	4.25	4.25
Idle Mode	2.0	2.0	2.0	2.0	2.0	2.0	2.0

*GB = Base2 GiB (GB = 1024x1024x1024)

OE PROTOCOLS AND SOFTWARE FACILITIES

Dell EMC Unity offers support for a wide variety of protocols and advanced features available via various software suites, plug-ins, drivers and packs.

PROTOCOLS AND FACILITIES SUPPORTED		
Access-based Enumeration (ABE) for SMB protocol	Address Resolution Protocol (ARP)	Block Protocols: iSCSI, Fibre Channel (FCP SCSI-3)
Controller based Data at Rest Encryption (D@RE)	DFS Distributed File System (Microsoft) as Leaf node or Standalone Root Server	Direct Host Attach for Fibre Channel and iSCSI
Dynamic Access Control (DAC) with claims support	Internet Control Message Protocol (ICMP)	Kerberos Authentication
LDAP (Lightweight Directory Access Protocol)	LDAP SSL	Link Aggregation for File (IEEE 802.3ad)
Lock Manager (NLM) v1, v2, v3, and v4	Management & Data Ports IPv4 and/or IPv6	NAS Servers Multi-protocol for UNIX and SMB clients (Microsoft, Apple, Samba)
Network Data Management Protocol (NDMP) v1-v4	Network Information Service (NIS) Client	Network Status Monitor (NSM) v1
Network Time Protocol (NTP) client	NFS v3/v4 Secure Support	NT LAN Manager (NTLM)
Portmapper v2	REST API: Open API that uses HTTP requests to provide management	Restriction of Hazardous Substances (RoHS) compliance
RSVD v1 for Microsoft Hyper-V	Simple Home Directory access for SMB protocol	SMI-S v1.6.0 compatible UFS64 File client
Simple Mail Transfer Protocol (SMTP)	Simple Network Management Protocol v3 (SNMP)	Virtual LAN (IEEE 802.1q)

* Controller based D@RE has been submitted for FIPS 140-2 validation

SOFTWARE

All Inclusive Base Software	Management Software:
	• Unisphere: Element Manager
	• Unisphere Central: Consolidated dashboard and alerting
	• CloudIQ: Cloud-based storage analytics
	• Thin Provisioning
	• Dynamic Pools
	• Compression (Block and File)
	• Proactive Assist: Configure remote support, online chat, open a service request, etc.
	• Quality of Service (Block and VVols)
	• Dell EMC Storage Analytics Adapter for VMware® vRealize™
	• File & Block Tiering / Archiving to Public/Private Cloud (Cloud Tiering Appliance)
	Unified Protocols:
	• File
	• Block
	• VVols
	Local Protection:
	• Controller Based Encryption (optional), with internal or external key management
	• Local Point-In-Time Copies (Snapshots and Thin Clones)
	• AppSync Basic
	• Dell EMC Common Event Enabler, AntiVirus Agent, Event Publishing Agent
	Remote Protection:
	• Native Asynchronous Block & File Replication
	• Native Synchronous Block Replication
	• Snapshot Shipping
	• Dell EMC RecoverPoint Basic
	• Dell EMC RecoverPoint for VMs
Interface Protocols	NFSv3, NFSv4, NFSv4.1; CIFS (SMB 1), SMB 2, SMB 3.0, SMB 3.02, and SMB 3.1.1; FTP and SFTP; FC, iSCSI included
Optional Software	• AppSync Advanced
	• Data Protection Suite: Backup, Archive and Collaboration Software
	• Dell EMC RecoverPoint Advanced
	• PowerPath Migration Enabler
	• PowerPath Multipathing
	• VPLEX

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

VIRTUALIZATION SOLUTIONS

Dell EMC Unity offers support for a wide variety of protocol and advanced features available via various software suites and packs including but not limited to:

• Dell EMC Storage Integrator (ESI): For provisioning within the Microsoft management context (Systems Center) for Hyper-V and SharePoint

• OpenStack Cinder Driver: For provisioning and managing block volumes within an OpenStack environment

• OpenStack Manila Driver: For managing shared file systems within an OpenStack environment

• Dell EMC Virtual Storage Integrator (VSI) for VMware vSphere™ : For provisioning, management, and cloning

• VMware 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

ELECTRICAL SPECIFICATIONS

All power figures shown represent a worst case product configuration with max normal values operating in an ambient temperature environment of 20°C to 25°C.

The chassis power numbers provided may increase when operating in a higher ambient temperature environment.

DISK PROCESSOR ENCLOSURE (DPE)

	300F DPE 25 2.5"SFF drives and four IO modules	400F DPE 25 2.5"SFF drives and four IO modules	500F DPE 25 2.5"SFF drives and four IO modules	600F DPE 25 2.5"SFF drives and four IO modules
POWER				
AC Line Voltage	100 to 240 VAC ± 10%, single phase, 47 to 63 Hz			
AC Line Current (operating maximum)	9.08 A max at 100 VAC; 4.54 A max at 200VAC	9.09 A max at 100 VAC; 4.55 A max at 200VAC	9.55 A max at 100 VAC; 4.78 A max at 200VAC	9.89 A max at 100 VAC; 4.95 A max at 200VAC
Power Consumption (operating maximum)	907.5 VA (903.5 W) max at 100 VAC; 907.5 VA (895.5 W) max at 200 VAC	909.0 VA (905.0 W) max at 100 VAC; 909.0 VA (897.0 W) max at 200 VAC	955.0 VA (951.0 W) max at 100 VAC; 955.0 VA (943.0 W) max at 200 VAC	9.89.0 VA (985.0 W) max at 100 VAC; 989.0 VA (977.0 W) max at 200 VAC
Power Factor	0.95 minimum at full load, @ 100/ 200 VAC			
Heat Dissipation (operating maximum)	3.25×10^6 J/hr, (3,083 Btu/hr) max at 100 VAC; 3.22×10^6 J/hr, (3,056 Btu/hr) max (100V*)	3.26×10^6 J/hr, (3,088 Btu/hr) max at 100 VAC; 3.23×10^6 J/hr, (3,061 Btu/hr) max (100V*)	3.42×10^6 J/hr, (3,245 Btu/hr) max at 100 VAC; 3.40×10^6 J/hr, (3,218 Btu/hr) max (100V*)	3.55×10^6 J/hr, (3,361 Btu/hr) max at 100 VAC; 3.55×10^6 J/hr, (3,334 Btu/hr) max (100V*)
In-rush Current	45 Apk "cold" per line cord, at any line voltage			
Startup Surge Current	120 Apk "hot" per line cord, at any line voltage			
AC Protection	15 A fuse on each power supply, single line			
AC Inlet Type	IEC320-C14 appliance coupler, per power zone			
Ride-through Time	10 ms min			
Current Sharing	± 5 percent of full load, between power supplies			
DIMENSIONS				
Weight kgs/lbs	empty 24.60/54.11	empty 24.60/54.11	empty 24.60/54.11	empty 24.60/54.11
Vertical size	2 NEMA units	2 NEMA units	2 NEMA units	2 NEMA units
Height cm/inches	8.88/3.5	8.88/3.5	8.88/3.5	8.88/3.5
Width cm/inches	44.76/17.62	44.76/17.62	44.76/17.62	44.76/17.62
Depth cm/inches	60.9/24.0	60.9/24.0	60.9/24.0	60.9/24.0

Note: Power consumption values for DPEs and DAEs are based on fully populated enclosures (power supplies, drives and I/O modules) running in a normal 20° to 25° C ambient temperature environment.

DISK ARRAY ENCLOSURE (DAE)

	25 x 2.5" Disk Array Enclosure	80 x 2.5" Disk Array Enclosure
POWER		
AC Line Voltage	100 to 240 VAC ± 10%, single phase, 47 to 63 Hz	
AC Line Current (operating maximum)	4.50 A max at 100 VAC, 2.40 A max at 200 VAC	13.18 A max at 100 VAC, 6.59 A max at 200 VAC
Power Consumption (operating maximum)	453.0 VA/ 432.0 W max at 100 VAC 485.0 VA/ 427.0 W max at 200VAC	1318.0 VA/ 1233.0 W max at 100 VAC 1318.0 VA/ 1233.0 W max at 200VAC
Power Factor	0.95 minimum at full load, @ 100V/200V	
Heat Dissipation (operating maximum)	1.56×10^6 J/hr, (1,474 Btu/hr) max at 100 VAC 1.54×10^6 J/hr, (1,457 Btu/hr) max at 200 VAC	4.43 x 106 J/hr, (4,207 Btu/hr) max at 100 VAC 4.43 x 106 J/hr, (4,207 Btu/hr) max at 200 VAC
In-rush Current	30 Apk "cold" per line cord, at any line voltage	45 Apk "cold" per line cord, at any line voltage
Startup Surge Current	40 Apk "cold" per line cord, at any line voltage	120 Apk "hot" per line cord, at any line voltage
AC Protection	15 A fuse on each power supply, single line	
AC Inlet Type	IEC320-C14 appliance coupler, per power zone	
Ride-through Time	12 ms minimum	10 ms minimum
Current Sharing	± 5 percent of full load, between power supplies	
WEIGHT AND DIMENSIONS		
Weight kg/lbs	Empty: 10.0/22.1 Full: 20.23/44.61	Empty: 11.33/25 Full: 58.9/130
Vertical size	2 NEMA units	3 NEMA units
Height cm/inches	8.46/3.40	13.21/5.20
Width cm/inches	44.45/17.5	44.70/17.6
Depth cm/inches	33.02/13	76.20/30

Note: Power consumption values for DPEs and DAEs are based on fully populated enclosures (power supplies, drives and I/O modules) running in a normal 20° to 25° C ambient temperature environment.

CABINETS

	STANDARD 40U CABINET
AC Line Voltage	200 to 240 VAC ± 10%, single-phase, 47 to 63 Hz
Power Configuration	One, two, three or four power domains, each redundant
Power Inlet Count	Two, four, six, or eight (two per domain)
Plug Types	NEMA L6-30P or IEC309-332 P6 or IP57 (Australia)
Input Power Capacity	1 Domain: 4,800 VA @ 200 VAC, 5,760 VA @ 240 VAC2 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, 20,040 VA @ 240 VAC
AC Protection	30 A site circuit breakers on each power branch
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)

OPERATING ENVIRONMENT (MEETS ASHRAE EQUIPMENT CLASS A4)

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). De-rate 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 improbable 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 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).
Exceptions to 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 exceptional range. Equipment operation is limited to ≤ 1% 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 45°C for a maximum of 1% of its annual operating hours. For temperatures between 35°C and 45°C (95°F to 104°F), de-rate maximum allowable dry bulb temperature by 1°C per 125m above 950m (1°F per 228 ft above 3117 ft).
Temperature Gradient		20°C / hour (36°F / hour)
Altitude	Max Operating	3050m (10,000ft)

STATEMENT OF COMPLIANCE

This Information Technology Equipment is compliant with the electromagnetic compatibility (Dell EMC) and product safety regulations/standards required by the countries in which the product is sold. Dell EMC compliance is based on FCC part 15, CISPR22/CISPR24 and EN55022/EN55024 standards, including applicable international variations. Dell EMC compliant Class A products are marketed for use in business, industrial, and commercial environments. Product Safety compliance is based on IEC 60950-1 and EN60950-1 standards, including applicable national deviations.

This Information Technology Equipment is in compliance with EU RoHS Directive 2011/65/EU.

The individual devices used in this product are approved under a unique regulatory model identifier that is affixed to each individual device rating label, which may differ from any marketing or product family name in this data sheet.

For additional information see https://support.emc.com, under the Safety & EMI Compliance Information tab.

CONFIGURE AND QUOTE DELL EMC UNITY.

Compare features, see options and get pricing: store.emc.com/unity

CONTACT US

To learn more, contact your local representative or authorized reseller.

D✕LL EMC