IBM Cloud Object Storage System™
Version 3.13.1

Slicestor® 2584 Appliance Manual

3409-S03/3401-S03/3403-S03

Note

Before using this information and the product it supports, read the following information:

- The general information in *Notices*
- The information in *Safety and environmental notices*
- The information in the *IBM Environmental Notices and User Guide* (provided on a DVD)

This edition applies to IBM Cloud Object Storage System™ Slicestor® 2584 and is valid until replaced by new editions.

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Safety and environmental notices

Review the safety notices, environmental notices, and electronic emission notices for IBM® Cloud Object Storage System before you install and use the product.

Suitability for telecommunication environment - This product is not intended to connect directly or indirectly by any means whatsoever to interfaces of public telecommunications networks.

Examples of a caution and a danger notice. Numbers in parentheses refer to message numbers in the *IBM Safety Notices* publication G229-9054, which is included with your product.

CAUTION:
A caution notice indicates the presence of a hazard that has the potential of causing moderate or minor personal injury. (C001)

DANGER

A danger notice indicates the presence of a hazard that has the potential of causing death or serious personal injury. (D002)

Safety notices

Safety notices for this product.

Familiarize yourself with the *IBM Safety Notices* publication G229-9054, which is included with your product.

DANGER: When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- **If IBM supplied a power cord(s), connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.**
- **Do not open or service any power supply assembly.**
- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**
- **The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.**
- **Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.**
- **Connect any equipment that will be attached to this product to properly wired outlets.**
- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.**
- **Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements.**
- **Do not continue with the inspection if any unsafe conditions are present.**
- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**
- **Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.**

  To disconnect:

  1. **Turn off everything (unless instructed otherwise).**
  2. **Remove the power cords from the outlets.**
  3. **Remove the signal cables from the connectors.**
  4. **Remove all cables from the devices.**

  To connect:

  1. **Turn off everything (unless instructed otherwise).**
  2. **Attach all cables to the devices.**
  3. **Attach the signal cables to the connectors.**
  4. **Attach the power cords to the outlets.**
  5. **Turn on the devices.**
- **Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching. (D005)**

DANGER: Heavy equipment — personal injury or equipment damage might result if mishandled. (D006)

DANGER: Professional movers are to be used for all relocation activities. Serious injury or death may occur if systems are handled and moved incorrectly. (D008)

DANGER: Serious injury or death can occur if loaded lift tool falls over or if a heavy load falls off the lift tool. Always completely lower the lift tool load plate and properly secure the load on the lift tool before moving or using the lift tool to lift or move an object. (D010)

CAUTION: The battery contains lithium. To avoid possible explosion, do not burn or charge the battery.
Do not: Throw or immerse into water, heat to more than 100°C (212°F), repair or disassemble. (C003)

Use the following general safety information for all rack mounted devices:

DANGER: Observe the following precautions when working on or around your IT rack system:

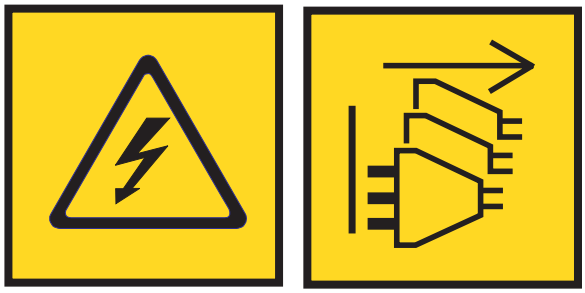
- **Heavy equipment—personal injury or equipment damage might result if mishandled.**
- **Always lower the leveling pads on the rack cabinet.**
- **Always install stabilizer brackets on the rack cabinet.**
- **To avoid hazardous conditions due to uneven mechanical loading, always install the heaviest devices in the bottom of the rack cabinet. Always install servers and optional devices starting from the bottom of the rack cabinet.**
- **Rack-mounted devices are not to be used as shelves or work spaces. Do not place objects on top of rack-mounted devices.**

- **Each rack cabinet might have more than one power cord. Be sure to disconnect all power cords in the rack cabinet when directed to disconnect power during servicing.**
- **Connect all devices installed in a rack cabinet to power devices installed in the same rack cabinet. Do not plug a power cord from a device installed in one rack cabinet into a power device installed in a different rack cabinet.**
- **An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock. (R001 part 1 of 2)**

CAUTION:

- **Do not install a unit in a rack where the internal rack ambient temperatures will exceed the manufacturer's recommended ambient temperature for all your rack-mounted devices.**
- **Do not install a unit in a rack where the air flow is compromised. Ensure that air flow is not blocked or reduced on any side, front or back of a unit used for air flow through the unit.**
- **Consideration should be given to the connection of the equipment to the supply circuit so that overloading of the circuits does not compromise the supply wiring or overcurrent protection. To provide the correct power connection to a rack, refer to the rating labels located on the equipment in the rack to determine the total power requirement of the supply circuit.**
- **(For sliding drawers): Do not pull out or install any drawer or feature if the rack stabilizer brackets are not attached to the rack. Do not pull out more than one drawer at a time. The rack might become unstable if you pull out more than one drawer at a time.**
- **(For fixed drawers): This drawer is a fixed drawer and must not be moved for servicing unless specified by the manufacturer. Attempting to move the drawer partially or completely out of the rack might cause the rack to become unstable or cause the drawer to fall out of the rack.**

(R001 part 2 of 2)



DANGER: Multiple power cords. The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords. (L003)

The weight of this part or unit is between 18 and 32 kg (39.7 and 70.5 lb). It takes two persons to safely lift this part or unit. (C009)

Environmental notices

This information contains all of the environmental notices for IBM Systems products in English and other languages.

The IBM Systems Environmental Notices (http://ibm.co/1fBgWFI) information includes statements on limitations, product information, product recycling and disposal, battery information, flat panel display, refrigeration and water-cooling systems, external power supplies, and safety data sheets.

Declared noise emissions

Declared noise emissions in accordance with ISO 9296(1, 2, 3)

Table 1. Declared noise emissions in accordance with ISO 9296(1,2,3)

Product description	Declared A-Weighted Sound Power Level, L_{WAd} (B)		Declared A-Weighted Sound Pressure Level, L_{pAm} (dB)	
	Operating	Idling	Operating	Idling
Model S03 @ 25 deg. C room ambient	8.0	8.0	61	61
Model S03 @ 35 deg. C room ambient	9.3	9.3	75	75
Model S03 @ 25 deg. C room ambient w/Acoustical doors Feature codes FC EC07 = back FC EC08 = front	7.4	7.4	55	55
Model S03 @ 35 deg. C room ambient w/Acoustical doors Feature codes FC EC07 = back FC EC08 = front	8.7	8.7	69	69

Notes:

1. Declared level L_{WAd} is the upper-limit A-weighted sound power level; Declared level L_{pAm} is the mean A-weighted sound pressure level measured at the 1-meter bystander positions.
2. All measurements made in conformance with ISO 7779 and declared in conformance with ISO 9296.
3. B, dB, abbreviations for bels and decibels, respectively. 1 B = 10 dB.

Support information

For more information on the product or help with troubleshooting, contact IBM Support at IBMCloudStorageSupport@us.ibm.com or visit the Directory of worldwide contacts.

Appendix A. Technical specifications

Dimensions

The table shows the dimensions of the enclosure.

Table 2. Enclosure dimensions

Dimension	Inches	Millimeters
Height (enclosure, overall)	8.75	222.3
Width across mounting flange	19	482.6
Depth from rear of front flanges to rear extremity of chassis	36	915

Components (fully populated)

The table shows the components that populate the enclosure.

Table 3. Components

Component	Quantity
Drawers	2
Disk Drives In Carriers (DDICs)	84
Compute module	1
PSUs	2
Cooling modules	5

Thermal

The table shows the specifications for the thermal sensors.

Table 4. Thermal specifications

Specification	Quantity
Thermal sensors	1 per drawer baseplane (three baseplanes per drawer)
	2 per power supply
Airflow with all fans running	4.24 cubic feet (120 liters) per second maximum

Temperature and humidity

The table shows the temperature and humidity limits for the enclosure.

Table 5. Temperature and humidity limits

Factor	Operating	Non-operating
Temperature range	41°F (5°C) to 95°F (35°C)	-40°F (-40°C) to 158°F (70°C)
Relative humidity	20%rh to 80%rh non-condensing	5%rh to 100%rh non-condensing
Maximum wet bulb	82°F (28°C)	84°F (29°C)

Cooling modules

Each of the five cooling modules contains two stacked fans: 80 mm x 80 mm x 38 mm.

AP-TL-1 and AP-LS-1 compute modules

The specifications table for the compute modules.

Table 6. Compute canister specifications

	AP-TL-1	AP-LS Family
Module Type	Application platform (AP)	Application platform (AP)
CPU Options	Intel "Sandy Bridge-EP" Xeon • E5-2609 4-core 2.4GHz (80W) • E5-2630L 6-core 2.0GHz (60W) • E5-2648L 8-core 1.8GHz (70W) Intel "Ivy Bridge-EP" Xeon • E5-2609 v2 4-core 2.5GHz (80W) • E5-2618L v2 6-core 2.0GHz (50W) • E5-2630 v2 6-core 2.6GHz (80W) • E5-2648L v2 10-core 1.9GHz (70W)	AP-LS-1 is designed to support the Intel Haswell-EP and Broadwell-EP CPUs.
RAM Options	DDR3 VLP DIMMs	DDR4DIMMs (including support for RDIMMs and ECC RAM)2
Boot Drive	SATA SSD	1or 2 x internal NGFF M.2 mSATA SSD
Expansion Cards	1PCIe x8 card (half length, half height, custom bezel)	"LS1": 1 half length, half height PCIeslot and a Daughter Card slot (based on PCIe) sized specifically for use in LS.
Battery	None	Metis Redundant Battery solution
Interfaces[1]		
SAS	1x External SAS Ports x 6Gb/s (4 laneseach)	2x Internal SAS ports x 12Gb/s (4 lanes each), 2 x External SAS ports x 12Gb/s (4 lanes each)
Ethernet	2 x 1Gb	3 x 1Gb
Fibre Channel	None	None
USB	2 x USB 2.0	2 x USB 3.0
HDMI	None	1 Type D (Micro)
Serial (3.5mm)	1	1
[1]Other interfaces can be added to LS controllers by using a PCIe expansion card or the Daughter Card Slot – but these are factory options.		

Power supply unit (2200 kW PSU)

The table shows the specifications of the PSU.

Table 7. PSU specifications

Category	Value
Output power	2214 W maximum continuous output power at high line voltage
Voltage	+12 V at 183A (2214 W)
	+5 V standby voltage at 2.7A
Input voltage range	200 - 240 VAC
Input frequency	50 - 60 Hz
Power factor correction	>0.95 @ ≥50% load
Efficiency	82% at 10% load
	90% at 20% load
	94% at 50% load
	91% at 100% load
Holdup time	> 20ms
Main power inlet connector	IEC60320 C20 with cable retention
Weight	3 kg

Power supply unit (2800 kW PSU)

The table shows the specifications of the PSU.

Table 8. PSU specifications

Category	Value
Output power	2814 W maximum continuous output power at high line voltage
Voltage	+12 V at 233.4A (2800 W)
	+5 V standby voltage at 2.7A
Input voltage range	200 - 240 VAC
Input frequency	50 - 60 Hz
Power factor correction	>0.95 @ 100% load
Efficiency	80% at 10% load
	88% at 20% load
	92% at 50% load
	88% at 100% load
Holdup time	5 ms from ACOKn high to rails out of regulation (see v2 specification).
Main power inlet connector	IEC320-C20 with cable retention
Weight	4 kg

Supported drives

The table shows the supported drives for the enclosure.

Table 9. Supported disk drives

Type	Description
Hard disk drives (HDD)	3.5″ 7200 rpm SATA drive
	Contact your storage vendor for details of other hard disk drives that are available for use in the system.

Shock and vibration tolerance

The table shows the shock tolerance for the enclosure.

Table 10. Shock and vibration tolerance

Type	Tolerance
Operational vibration	0.21 g RMS, 5 - 500 Hz random with <10% throughput loss
Operational shock	5 g 10 ms ½sine
Relocation vibration (non-operational)	0.3 g, 2 - 200 to 2 Hz swept sine
Non-operational vibration	1.04 g RMS, 2 - 200 Hz random
Non-operational shock	20 g 10 ms ½sine

Appendix B. Standards and regulations

The appliance is designed to comply with the standards and regulations enumerated in sections below. This compliance includes any sample units.

EMC qualification

Slicestor® 2584 meets a number of EMC standards.

Slicestor® 2584 carries EMC approval for the following territories:

- Australia/New Zealand
- Canada
- European Union
- United States of America
- Taiwan (CNS 13438-2006)

Conducted emission limit levels

Slicestor® 2584 complies with the following EMC conducted emission limit standards to a greater than 6dB margin:

- EN 55022:2006 including A1:2007 / CISPR 22-Class A
- United States CFR47 Part 15: Radio Frequency Devices, Subpart B: Unintentional Radiators, Class A

Class A labeling is used.

Radiated emissions limit levels

Slicestor® 2584 complies with the following EMC radiated emission limit standards to a greater than 6dB margin:

- EN 55022:2006 including A1:2007 / CISPR 22-Class A
- Individual shelves and towers comply with United States CFR47 Part 15: Radio Frequency Devices, Subpart B: Unintentional Radiators, Class A

Class A labeling is used.

Harmonics

EMC harmonics are in accordance with EN 61000-3-2:2006.

Flicker

EMC flicker is in accordance with EN 61000-3-3:2008.

Immunity limit levels

EMC immunity is in accordance with European standard EN 50024:1998 including A1:2001 and A2:2003.

Acoustics

Slicestor® 2584 produces an operating sound power of < LWAd 8.2 Bels (re 1pW) at an ambient temperature of 73°F (23°C).

AC power cords

If supplying your own power cord, you must meet a number of specifications.

Table 11. Power cord specifications

Country	Cord type	Plug (AC source)	Socket (PSU socket)	Comments
USA	SJT or SVT, 12 AWG minimum, 3 conductor	IEC 320 C20, 250V, 20A or a suitable plug rated 250V, 20A	IEC 320 C19, 250V, 20A	Must be NRTL LISTED (National Recognized Test Laboratory, such as UL)
Europe & Others	Harmonized, H05-VVF-3G2.5	IEC 320 C20, 250V, 16A or a suitable plug rated 250V, 16A	IEC 320 C19, 250V, 16A	

Important: The plug and the complete power cord assembly must meet the standards appropriate to the country, and must have safety approvals acceptable in that country.

SMM Phase

POST Codes – SMM Phase

Table 12. POST Codes – SMM Phase

Description	Value
SMM_IDENTIFY_FLASH_DEVICE	0xA0
SMM_SMM_PLATFORM_INIT	0xA2
SMM_ACPI_ENABLE_START	0xA6
SMM_ACPI_ENABLE_END	0xA7
SMM_S1_SLEEP_CALLBACK	0xA1
SMM_S3_SLEEP_CALLBACK	0xA3
SMM_S4_SLEEP_CALLBACK	0xA4
SMM_S5_SLEEP_CALLBACK	0xA5
SMM_ACPI_DISABLE_START	0xA8
SMM_ACPI_DISABLE_END	0xA9

Appendix C. **** MISSING FILE ****

This file was generated during the publishing process

SEC Phase

POST Codes – SEC Phase

Table 13. POST Codes – SEC Phase

Description	Value
SEC_SYSTEM_POWER_ON	0x01
SEC_BEFORE_MICROCODE_PATCH	0x02
SEC_AFTER_MICROCODE_PATCH	0x03
SEC_ACCESS_CSR	0x04
SEC_GENERIC_MSRINIT	0x05
SEC_CPU_SPEEDCFG	0x06
SEC_SETUP_CAR_OK	0x07
SEC_FORCE_MAX_RATIO	0x08
SEC_GO_TO_SECSTARTUP	0x09
SEC_GO_TO_PEICORE	0x0A

DXE Phase

POST Codes – DXE Phase

Table 14. POST Codes – BDS Phase

Description	Value
DXE_TCGDXE	0x40
DXE_SB_SPI_INIT	0x41
DXE_CF9_RESET	0x42
DXE_SB_SERIAL_GPIO_INIT	0x43
DXE_SMMACCESS	0x44
DXE_NB_INIT	0x45
DXE_SIO_INIT	0x46
DXE_LEGACY_REGION	0x47
DXE_SB_INIT	0x48
DXE_IDENTIFY_FLASH_DEVICE	0x49
DXE_FTW_INIT	0x4A
DXE_VARIABLE_INIT	0x4B
DXE_VARIABLE_INIT_FAIL	0x4C
DXE_MTC_INIT	0x4D
DXE_CPU_INIT	0x4E
DXE_MP_CPU_INIT	0x4F

Table 14. POST Codes – BDS Phase (continued)

DXE_SMBUS_INIT	0x50
DXE_SMART_TIMER_INIT	0x51
DXE_PCRTC_INIT	0x52
DXE_SATA_INIT	0x53
DXE_SMM_CONTROLER_INIT	0x54
DXE_LEGACY_INTERRUPT	0x55
DXE_RELOCATE_SMBASE	0x56
DXE_FIRST_SMI	0x57
DXE_VTD_INIT	0x58
DXE_BEFORE_CSM16_INIT	0x59
DXE_AFTER_CSM16_INIT	0x5A
DXE_LOAD_ACPI_TABLE	0x5B
DXE_SB_DISPATCH	0x5C
DXE_SB_IOTRAP_INIT	0x5D
DXE_SUBCLASS_DRIVER	0x5E
DXE_PPM_INIT	0x5F
DXE_HECIDRV_INIT	0x60
DXE_VARIABLE_RECLAIM	0x61
DXE_FLASH_PART_NONSUPPORT	0x62

BDS Phase

POST Codes – BDS Phase

Table 15. POST Codes – BDS Phase

Description	Value
BDS_ENTER_BDS	0x10
BDS_INSTALL_HOTKEY	0x11
BDS_ASF_INIT	0x12
BDS_PCI_ENUMERATION_START	0x13
BDS_BEFORE_PCIIO_INSTALL	0x14
BDS_PCI_ENUMERATION_END	0x15
BDS_CONNECT_CONSOLE_IN	0x16
BDS_CONNECT_CONSOLE_OUT	0x17
BDS_CONNECT_STD_ERR	0x18
BDS_CONNECT_USB_HC	0x19
BDS_CONNECT_USB_BUS	0x1A
BDS_CONNECT_USB_DEVICE	0x1B
BDS_NO_CONSOLE_ACTION	0x1C
BDS_DISPLAY_LOGO_SYSTEM_INFO	0x1D
BDS_START_IDE_CONTROLLER	0x1E
BDS_START_SATA_CONTROLLER	0x1F

Table 15. POST Codes – BDS Phase (continued)

BDS_START_ISA_ACPI_CONTROLLER	0x20
BDS_START_ISA_BUS	0x21
BDS_START_ISA_FDD	0x22
BDS_START_ISA_SEIRAL	0x23
BDS_START_IDE_BUS	0x24
BDS_START_AHCI_BUS	0x25
BDS_CONNECT_LEGACY_ROM	0x26
BDS_ENUMERATE_ALL_BOOT_OPTION	0x27
BDS_END_OF_BOOT_SELECTION	0x28
BDS_ENTER_SETUP	0x29
BDS_ENTER_BOOT_MANAGER	0x2A
BDS_BOOT_DEVICE_SELECT	0x2B
BDS_EFI64_SHADOW_ALL_LEGACY_RO M	0x2C
BDS_ACPI_S3SAVE	0x2D
BDS_READY_TO_BOOT_EVENT	0x2E
BDS_GO_LEGACY_BOOT	0x2F
BDS_GO_UEFI_BOOT	0x30
BDS_LEGACY16_PREPARE_TO_BOOT	0x31
BDS_EXIT_BOOT_SERVICES	0x32
BDS_LEGACY_BOOT_EVENT	0x33
BDS_ENTER_LEGACY_16_BOOT	0x34
BDS_RECOVERY_START_FLASH	0x35
BDS_START_SDHC_BUS	0x36
BDS_CONNECT_ATA_LEGACY	0x37
BDS_CONNECT_SD_LEGACY	0x38
POST_BDS_NO_BOOT_DEVICE	0xF9
POST_BDS_START_IMAGE	0xFB
POST_BDS_ENTER_INT19	0xFD
POST_BDS_JUMP_BOOT_SECTOR	0xFE

SMM Phase

POST Codes – SMM Phase

Table 16. POST Codes – SMM Phase

Description	Value
SMM_IDENTIFY_FLASH_DEVICE	0xA0
SMM_SMM_PLATFORM_INIT	0xA2
SMM_ACPI_ENABLE_START	0xA6
SMM_ACPI_ENABLE_END	0xA7
SMM_S1_SLEEP_CALLBACK	0xA1
SMM_S3_SLEEP_CALLBACK	0xA3

Table 16. POST Codes – SMM Phase (continued)

SMM_S4_SLEEP_CALLBACK	0xA4
SMM_S5_SLEEP_CALLBACK	0xA5
SMM_ACPI_DISABLE_START	0xA8
SMM_ACPI_DISABLE_END	0xA9

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