

# **Alnico Lite AL-6060 Series RAID Subsystem**

## **Hardware Installation Guide**

**Ver. 1.3**

**2009/04/15**

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## Regulatory information



### For Europe

This drive is in conformity with the EMC directive.



### Federal Communications Commission (FCC)

#### Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules.

Those limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antennas.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

#### Warning:

A shielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used.

Use only shielded cables to connect I/O devices to this equipment.

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

## About This Hardware Installation Guide

Welcome to Hardware Installation Guide. This guide is designed to be used as step-by-step instructions for installation of your subsystem, and covers everything you need to know in learning how to operation, troubleshooting and future upgrades. For the detail about how to configure your subsystem, please refer to the Software Operation manual.

## Symbols in Text

These symbols may be found in the text of this guide. They have the following meanings.



**Caution**

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### Caution

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*This icons indicates that failure to follow directions could result in personal injury, damage to your equipment or loss of information.*

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**NOTE**

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### Note

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*This icon presents commentary, sidelights, or interesting points of information. .*

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Important terms, commands and programs are put in **Boldface** font.

Screen text is given in **screen** font.

## *Contents*

ABOUT THIS HARDWARE INSTALLATION GUIDE.....	IV
SYMBOLS IN TEXT.....	IV
CONTENTS.....	V
<b>CHAPTER 1. INTRODUCTION .....</b>	<b>1</b>
MODEL VARIATIONS .....	1
FEATURES .....	1
UNDERSTANDING THE ALNICO LITE SUBSYSTEM.....	2
<i>Front Panel Overview</i> .....	2
<i>Rear Panel Overview</i> .....	4
<b>CHAPTER 2. INSTALLATION.....</b>	<b>5</b>
UNPACKING & CHECKING THE EQUIPMENT.....	5
WHAT ELSE YOU NEED .....	5
ESD PRECAUTION.....	6
INSTALLING HARD DISKS .....	6
SYSTEM CONNECTION.....	7
<b>CHAPTER 3. TROUBLE SHOOTING .....</b>	<b>8</b>
HOT SWAPPING TO REPLACE THE FAN MODULE.....	8
HOT SWAPPING TO REPLACE THE POWER MODULE (FOR AL-6060R ONLY).....	9
<b>APPENDIX A. CONNECTORS .....</b>	<b>10</b>
<b>APPENDIX B. SPECIFICATIONS .....</b>	<b>13</b>
SPECIFICATIONS .....	13



# Chapter 1. INTRODUCTION

This chapter introduces the features and capabilities of Alnico series RAID subsystems.

You will find:

- ⇒ A full introduction to your Alnico RAID subsystem.
- ⇒ Details of key features and supplied accessories.

## Model Variations

There are four available models in Alnico Lite RAID storage subsystem series, two of them utilize single Ultra320 SCSI as Host interface, and with 6 SATA-II device bays. AL-6060R come with 2 x 250watts redundant power modules, AL-6060S only come with standard ATX 250 watts power supply.

Rest of them utilize dual 4 Gb Fibre as Host interface, and with 6 SATA-II device bays.

<i>Model Name</i>	<i>Host Interface</i>	<i>Device bays</i>	<i>Power System</i>
AL-6060R-S	Single Ultra320 SCSI	6 SATA-II bays	2 x 250watts redundant power modules,
AL-6060S-S	Single Ultra320 SCSI	6 SATA-II bays	standard ATX 300 watts power supply.
AL-6060R-F	Dual 4Gbps Fibre Host	6 SATA-II bays	2 x 250watts redundant power modules,
AL-6060S-F	Dual 4Gbps Fibre Host	6 SATA-II bays	standard ATX 300 watts power supply.

## Features

The unique and well-designed 'Alnico Lite (AL-6060)' series is categorized as the Entry-level in Alnico series, it combines the new generation SATA-II hard drive interface with high performance Ultra 320 SCSI host connection or Dual 4Gbps Fibre iinterface and its superior performance makes this entry-level

RAID technologically advance as well as reliable. The easy management with e-mail event notification feature requires no supervision of IT personnel which provides the perfect environment for small business department.

The portability Tower-type enclosure provides end-user the flexible connection to various desktops and tower-type servers. Under the stylish Alnico Lite outlook, it features the storage flexibility and simplicity while ensuring optimum data protection.

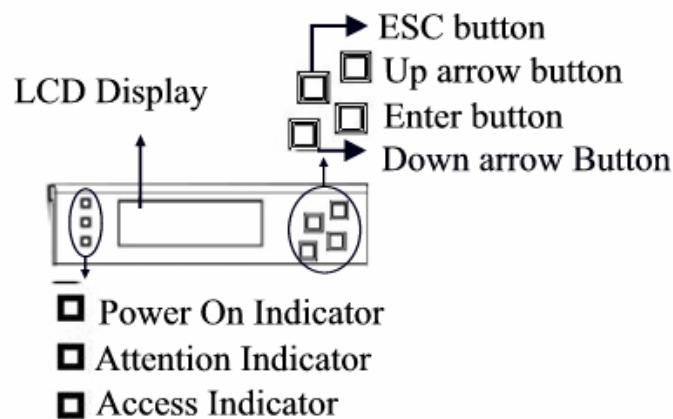
The Alnico Lite series supports the following feature

- High performance super scalar Intel Xscale 80219 IO processor.
- Superior Array Management Firmware supports RAID levels 0, 1 (0+1), 3, 5, 6 and JBOD RAID configurations.
- Advanced 100MHz/64-bit PCI-X bus architecture
- Fixed 256MB DDR SDRAM onboard Cache memory with ECC protection.
- AL-6060-S: Single Ultra-320 SCSI Host Interconnect supported.
- AL-6060-F: Dual 4Gb Fibre Host Interface supported. (SFP Socket)
- New generation Serial ATA II Drive Interface supported,
- Redundant and Hot Swappable Fan, Power and Drives.
- Hot Swap, Hot Spare and Automatic Drive Rebuild Supported.
- Configuration and environmental information is accessible either via the control panel or Serial Port or 10/100 Ethernet LAN port.
- E-mail event notification.
- AL-6060R : Load sharing hot swappable redundant power system with PFC function.
- AL-6060S : Standard ATX 250watts power supply with PFC function.
- Host System independent.
- Operating System independent.

## **Understanding the Alnico Lite subsystem**

### **Front Panel Overview**

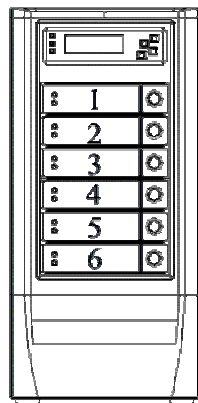
## LCD Module



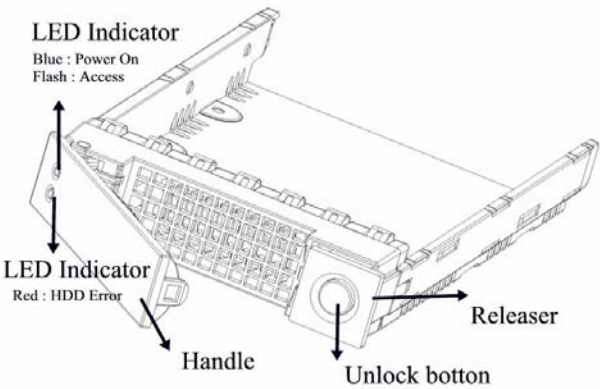
## Driver Bay numbering convention

The enclosure bay numbering convention is shown in following figure. A bay is designed to house a single 1.0-inch high, 3,5-inch hard disk drive in his carrier module.

AL-6060

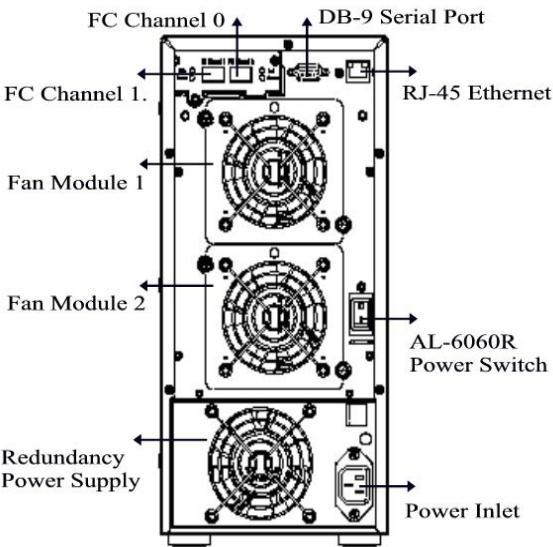


Drive Bay

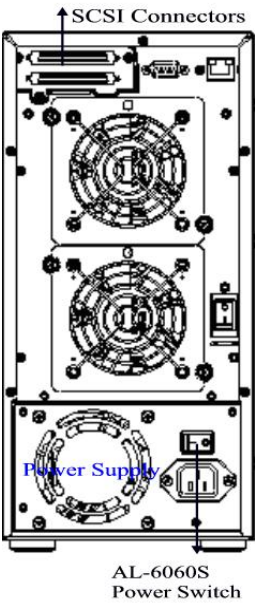


Rear Panel Overview

AL-6060R-F



AL-6060S-S



## Chapter 2. INSTALLATION

**This chapter presents:**

- ⇒ **Instructions on unpacking & checking the equipment**
- ⇒ **Instructions on how to install Hard disk drive**
- ⇒ **Instructions on how to install Alnico RAID in a Rack.**
- ⇒ **Instructions on how to connect Alnico RAID.**

### Unpacking & checking the Equipment

Before unpacking the Alnico Lite RAID subsystem, prepare a clean, stable surface to put on the contents of Alnico Lite RAID shipping container. Altogether, you should find following items in the package :

#### Alnico Lite RAID Subsystem

- Alnico Lite RAID subsystem x1
- CD-ROM x 1 ( Includes Hardware Installation Guide, Software operation Manual & HTTP Proxy Server utility for Web browser-based Configuration).
- Ultra320 SCSI Cable x1 (AL-6060R/S-S only).
- Null cable x1
- Ultra320 SCSI Active Terminator x1 (AL-6060R/S-S only).
- Power Cord x 1
- Mounting screws (bag) x1

#### What else you need

- Hard disk drives (different RAID levels requires different numbers of HDDs. Refer to Software Operation manual for more detail information.
- Host computer with SCSI interface.
- Dedicated terminal or PC with third party communication software that supports ANSI terminal emulation (required for viewing Monitor Utility)

## ESD Precaution

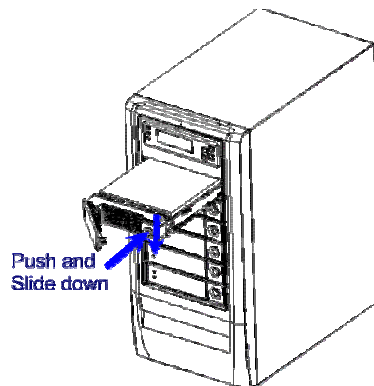
Use a suitable anti-static wrist or ankle strap and observe all conventional ESD precaution when handle Alnico Lite RAID's modules and components. Avoid contact with backplane components and module connectors.

## Installing hard disks

The Alnico Lite RAID series includes 6 hot swappable drive bays. The following sections describe how to install disks into Alnico Lite RAID subsystems.

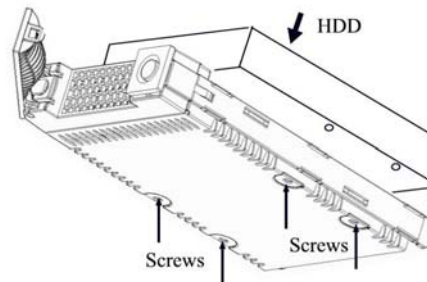
### Remove the empty hot swappable driver bays

1. Push the unlock button then slide down the Releaser on drive bays .
2. Left the handle to disengage the drive bay from the slot.



### Loading Hard Disk to the drive bay.

1. Put HDD into the bay.
2. Fasten all 4 screws to mount HDD in the bay and make sure the HDD is properly tightened.



### Place drive bays back into the system

1. Slide in drive bay, make sure the handle is open fully.
2. Close the handle to engage the drive bay into the slot.

**NOTE**

*The hard drives in a RAID array should match in size and speed. All drives in any array should be identical models with the same firmware versions. RAID arrays can use any size drive, however the smallest drive will determine the size of the array.*

**Caution**

1. *Only use the screws offered with Alnico RAID subsystem. Longer screws might cause the drive damage.*
2. *All the drive bays ( with or without hard drive) must be placed in the Alnico subsystem. Alnico's cooling system is designed with full of drive bays. Missing drive bays might cause the subsystem damage.*

## System Connection

Connect all cables and power cord as shown below :

Cable	Alnico Lite RAID	Device	Purpose
Null Cable	RS-232 Port	ANSI Terminal or a PC with Terminal emulator.	Configuration Utility
AL-6060-S SCSI cable	SCSI connector	HBA of Host computer	Host interface between RAID and Host computer
AL-6060-F Fabric+SFP transceiver	SFP socket	HBA of Host computer	Host interface between RAID and Host computer
Power Cord	Power inlet	A/C power outlet	A/C power input
RJ 45 Cable	Ethernet Port	Switch or HUB	Connect to Internet .

**NOTE**

*Alnico RAID subsystem do not require the installation of different drivers for use with different operating systems. Alnico RAID is independent and transparent to the host operating system.*

## Chapter 3. TROUBLE SHOOTING

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**This chapter contains trouble shooting procedures and suggestions to minimize their impact on the Alnico RAID operation :**

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⇒ **Instructions on how to replace the components of Alnico RAID subsystem.**

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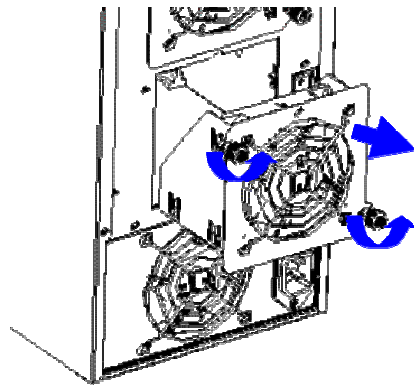
If the fault LED on the front panel and LCD of Alnico RAID lights red and LCD displays a error message , or if Alnico RAID's Internet manager indicates a fault, determine the reason for this alert immediately. Examine the component LEDs to see if any indicates a fault, then replace it as soon as possible.

### Hot Swapping to replace the Fan Module

This section provides instructions for the removal and installation of the Fan Module indicated in the figure below.

#### Removing the Fan Module from Alnico :

Release thumb screws then pull the module out of system.

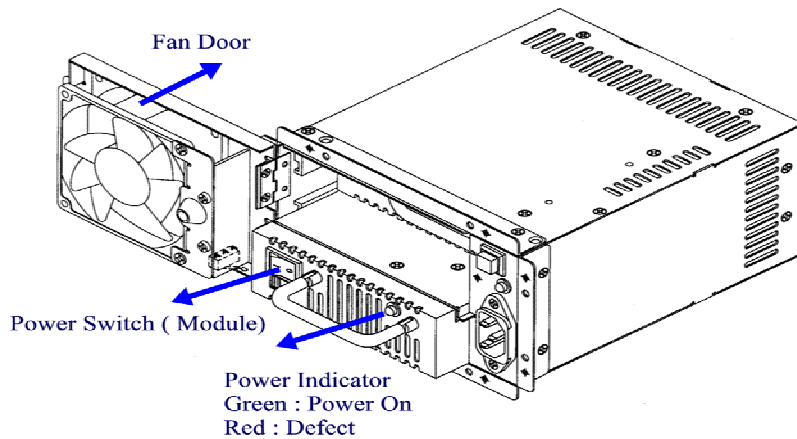


#### Installing the Fan module into Alnico :

Insert a Fan module, then fasten thumb screws.

## Hot Swapping to replace the Power Module (For AL-6060R only)

This section provides instructions for the removal and installation of the Power Module indicated in the figure below.



### Removing the Power Module from Alnico Lite AL-6060R :

- A. Unscrew the thumb screw of Fan Door. Then open the fan door ( Fan will stop automatically.)
- B. Pull out the power module whose Power Indicator lights as red ( Defect).

### Installing the Power module into Alnico Lite AL-6060R:

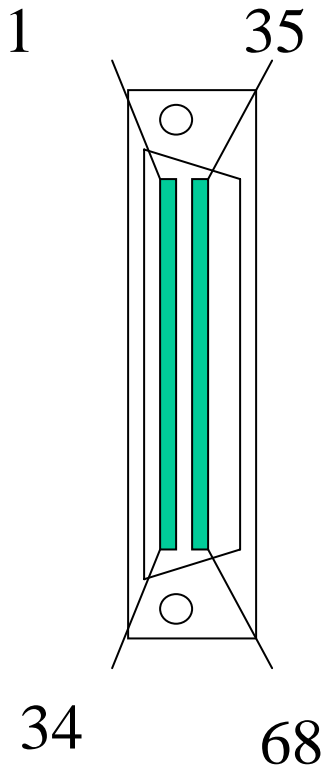
- A. Insert a Power module.
- B. Closed the fan door and fasten the thumb screw.



The Power indicator will turn bright "Green" to indicate it has powered on

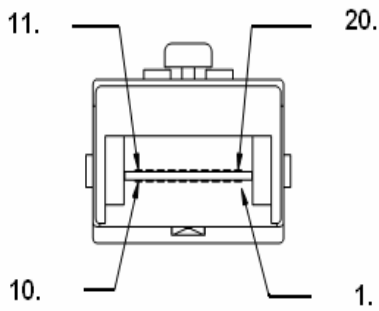
# Appendix A. CONNECTORS

## SCSI Connector



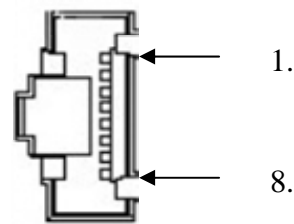
Pin#	Signal Name	Pin#	Signal Name
1	SCSI_AC_DAT<12>+	35	SCSI_AC_DAT<12>-
2	SCSI_AC_DAT<13>+	36	SCSI_AC_DAT<13>-
3	SCSI_AC_DAT<14>+	37	SCSI_AC_DAT<14>-
4	SCSI_AC_DAT<15>+	38	SCSI_AC_DAT<15>-
5	SCSI_AC_PAR<1>+	39	SCSI_AC_PAR<1>-
6	SCSI_AC_DAT<0>+	40	SCSI_AC_DAT<0>-
7	SCSI_AC_DAT<1>+	41	SCSI_AC_DAT<1>-
8	SCSI_AC_DAT<2>+	42	SCSI_AC_DAT<2>-
9	SCSI_AC_DAT<3>+	43	SCSI_AC_DAT<3>-
10	SCSI_AC_DAT<4>+	44	SCSI_AC_DAT<4>-
11	SCSI_AC_DAT<5>+	45	SCSI_AC_DAT<5>-
12	SCSI_AC_DAT<6>+	46	SCSI_AC_DAT<6>-
13	SCSI_AC_DAT<7>+	47	SCSI_AC_DAT<7>-
14	SCSI_AC_PAR<0>+	48	SCSI_AC_PAR<0>-
15	GND	49	GND
16	GND	50	GND
17	TERMPWRA	51	TERMPWRA
18	TERMPWRA	52	TERMPWRA
19	GND	53	GND
20	GND	54	GND
21	SCSI_AC_ATN_L+	55	SCSI_AC_ATN_L-
22	GND	56	GND
23	SCSI_AC_BSY_L+	57	SCSI_AC_BSY_L-
24	SCSI_AC_ACK_L+	58	SCSI_AC_ACK_L-
25	SCSI_AC_RST_L+	59	SCSI_AC_RST_L-
26	SCSI_AC_MSG_L+	60	SCSI_AC_MSG_L-
27	SCSI_AC_SEL_L+	61	SCSI_AC_SEL_L-
28	SCSI_AC_CD_L+	62	SCSI_AC_CD_L-
29	SCSI_AC_REQ_L+	63	SCSI_AC_REQ_L-
30	SCSI_AC_IO_L+	64	SCSI_AC_IO_L-
31	SCSI_AC_DAT<0>+	65	SCSI_AC_DAT<0>-
32	SCSI_AC_DAT<9>+	66	SCSI_AC_DAT<9>-
33	SCSI_AC_DAT<10>+	67	SCSI_AC_DAT<10>-
34	SCSI_AC_DAT<11>+	68	SCSI_AC_DAT<11>-

Fibre SFP



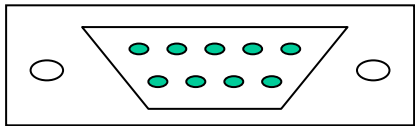
Pin #	Signal Name
1	V <sub>EFT</sub>
2	T <sub>FAULT</sub>
3	T <sub>DIS</sub>
4	MOD_DEF(2)
5	MOD_DEF(1)
6	MOD_DEF(0)
7	Rate Select
8	LOS
9	V <sub>EER</sub>
10	V <sub>EER</sub>
11	V <sub>EER</sub>
12	RD-
13	RD+
14	V <sub>EER</sub>
15	V <sub>CCR</sub>
16	V <sub>CCT</sub>
17	V <sub>EET</sub>
18	TD+
19	TD-
20	V <sub>EET</sub>

Ethernet RJ-45 Connector



Pin#	Signal Name
1	TX+
2	TX-
3	RX+
4	NC
5	NC
6	RX-
7	NC
8	NC

**RS-232 & Modem Male Connector**



Pin#	Signal	Pin#	Signal
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	TXC
5	GND		

# Appendix B. Specifications

## *Specifications*

<b>RAID Architecture</b>
Intel Xscale 80219 I/O processor
Fixed 256MB DDR SDRAM on board cache memory with ECC protection
Advanced 64-bit PCI-X Bus architecture
<b>RAID Features</b>
RAID Levels : 0, 1, 3, 5, 6, 0+1 & JBOD
Multiple RAID selection
Online RAID level/stripe size migration
Online Array roaming
Online capacity expansion and RAID level migration simultaneously
Instant availability and background initialization
Automatic drive insertion / removal detection and rebuilding
<b>Host Interface</b>
AL-6060R/S-S : Single Ultra320 SCSI Channel - 320MB/sec per channel
AL-6060R/S-F : Dual 4Gbs Fibre Channel (By 2 X SFP sockets)
<b>Drive Interface</b>
6 SATA-II channel -3Gbps
<b>Monitors/Indicators</b>
LCD Control Panel for setup, alarm mute and configuration
System status indication through LCD, LED and alarm buzzer
All system events can be sent to multiple user alerts to be via ' Plain English' e-mails.
<b>RAID Management</b>
Field-upgradeable firmware in flash ROM.
Firmware-embedded manager via RS-232 port.
Firmware-embedded SMTP manager – Monitor all system events and user can select either single or multiple user alerts to be sent via ' Plain English' e-mails.
Firmware-embedded Web Browser-based RAID manager via 10/100 Ethernet port

Operating System		
OS independent and transparent.		
Environmental /Physical		
<b>Cooling System</b>	Hot swappable and redundant Cooling Fan modules.	
<b>Power System</b>	AL6060R	AL-6060S
	Redundant by Dual 250W Power modules with PFC feature, Load Sharing type.	Single 300W Power Supply with PFC feature. Low noise.
<b>Electrical</b>	AC Voltage 110-240 VAC Ac Frequency 50-60Hz	
<b>Temperature</b>	Operating Temperature : 10 to 35 degree C.	
<b>Relative Humidity</b>	20% to 80% non-condensing	
<b>Dimensions</b>	166mm(W) x 278mm(D) x 346mm (H)	
<b>Weight</b>	AL-6060S	13.5Kg(W/O HDD)
	AL-6060R	14.5Kg(W/O HDD)



*Specifications subject to change without notice.*

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