

User Manual

ARK-6610/6620

Compact Mini-ITX Chassis

Trusted ePlatform Services

ADVANTECH

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Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

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If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandise authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Initial Inspection

Before you begin installing your motherboard, please make sure that the following materials have been shipped:

- ARK-6610 (ARK-6620) Chassis
- User Manual
- Warranty Card
- Accessory box with a package of screws (for fastening the various disk drives), a pair of mounting brackets and four rubber pads

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the ARK-6610/ARK-6620 mechanically and electrically before shipment. It should be free of marks and scratches, and in perfect working order upon receipt. As you unpack the ARK-6610/ARK-6620, check it for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or it fails to meet the specifications, notify our service department or your local sales representative immediately. Also notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

Declaration of Conformity

CE

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class A

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. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Technical Support and Assistance

1. Visit the Advantech web site at www.advantech.com/support where you can find the latest information about the product.
2. Contact your distributor, sales representative or Advantech customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
 - Product name and serial number
 - Description of your peripheral attachments
 - Description of your software (operating system, version, application software, etc.)
 - A complete description of the problem
 - The exact wording of any error messages

Warnings and Cautions

Warning! *Warnings indicate conditions, which if not observed, can cause personal injury!*



Caution! *Cautions are included to help you avoid damaging hardware or losing data. e.g.*



There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Document Feedback

To assist us in making improvements to this manual, we would welcome comments and constructive criticism. Please send all such - in writing to: support@advantech.com.

Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated into the equipment.
 - The equipment has been exposed to moisture.
 - The equipment does not work well, or you cannot get it to work according to the user manual.
 - The equipment has been dropped and damaged.
 - The equipment has obvious signs of breakage.
15. **DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.**
16. **CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.**

The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
- Disconnect the power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

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Chapter 1

General Information

This chapter provides general information about the ARK-6610/6620. Sections include:

- Introduction
- Specification
- Environment
- Power Supply Option
- Dimensions
- Safety Precautions

1.1 Introduction

The ARK-6610 (ARK-6620) industrial computer chassis is specifically designed for embedded applications. It is a wall-mountable/desktop computer that is ideal for system integrators or users who require a compact and rugged computing platform for embedded applications. The ARK-6610 (ARK-6620) supports a wide range computing peripherals to be integrated with the chassis. Standard Mini-ITX motherboards with up to one add-on card may be installed in the ARK-6610.

1.1.1 Outstanding ID and mechanical designs

Unlike the classic industrial computer, ARK-6610 (ARK-6620) has an innovative appearance. It can be placed on the desk or mounted bidirectionally by the supplied brackets. It can be easily mounted onto most surfaces, such as walls or workbenches. The shockproof disk drive housing design protects the system against harsh industrial environments. The front access I/O interfaces make it much easier to operate and maintain while installed in ticketing machines, medical equipment or other machines. Extra COM/USB/LVDS/DVI/TV cutouts meet flexible I/O configurations. All these outstanding features make ARK-6610 (ARK-6620) the best solution for price, performance and total cost of ownership.

1.2 Specification

- **Construction:** Heavy-duty steel
- **Disk drive capacity:**
 - ARK-6610: one internal 3.5" HDD and one slim-CD-ROM, CD-R/W or DVD-ROM drive
 - ARK-6620: one internal 3.5" HDD
- **I/O interfaces on front bezel:**
 - ARK-6610: five COM cutouts, two DVI/LVDS cutouts, one S/C-video cutout, two USB cutouts and one WLAN antenna cutout
 - ARK-6620: one DVI/LVDS cutout, one S/C-video cutout and one WLAN antenna cutout
- **LED indicators on front bezel:** blue LED for power, blue LED for HDD activity and dual-color LED (blue and red) for over-heating warning
- **Button on the front bezel:** power button
- **Cooling system:**
 - ARK-6610: one 52.5 CFM cooler (W x H x D: 92 x 92 x 25.4 mm)
 - ARK-6620: two 27.72 CFM coolers (W x H x D: 60 x 60 x 13 mm)
- **Air filter:** one washable and reusable filter mounted near the rear of the chassis
- **Gross weight:**
 - ARK-6610: 4.76 kg (10.47 lb)
 - ARK-6620: 3.49 kg (7.68 lb)
- **Dimensions (width x height x depth)**
 - ARK-6610 : 250 x 156 x 250 mm (9.9" x 6.2" x 9.9")
 - ARK-6620 : 272 x 78 x 232 mm (10.74" x 3.08" x 9.16")

1.3 Environment

- **Temperature:**
 - (Operating) 0 to 40° C (32 to 104° F)
 - (Non-Operating) -20 to 60° C (-4 to 140° F)
- **Humidity:**
 - (Operating) 10 to 85% @ 40° C, non-condensing
 - (Non-Operating) 10 to 95% @ 40° C, non-condensing
- **Vibration (5 ~ 500 MHz):**
 - (Operating) 1 Grms
 - (Non-Operating) 2 Grms

1.4 Power Supply Option

- **Model Name:** 1757000878
- **Watt:** 180 W max (ATX, PFC)
- **AC Input Rating:** 100 ~ 240 V, 2 ~ 4 A, 50 ~ 60 Hz
- **Output Voltage:** +5 V @ 16 A, +3.3 V @ 14 A, +12 V @ 14 A, -12 V @ 0.5 A, +5 VSB @ 2 A
- **Minimum Load:** +5 V @ 0.3 A, +3.3 V @ 0.3 A, +12 V @ 0.3 A
- **MTBF:** 100,000 hours @ 25° C
- **Safety:** UL/TUV/CE

1.5 Dimensions

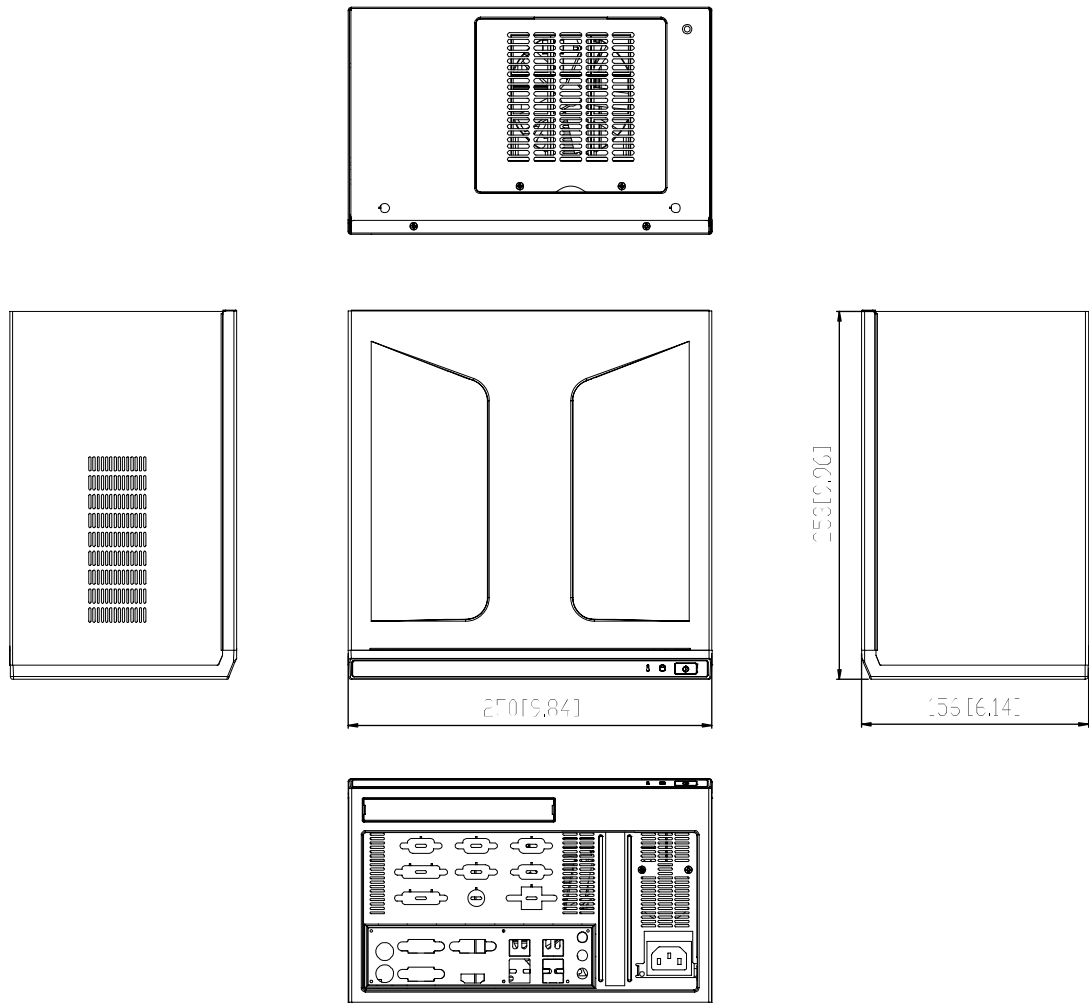


Figure 1.1 ARK-6610 Dimensions

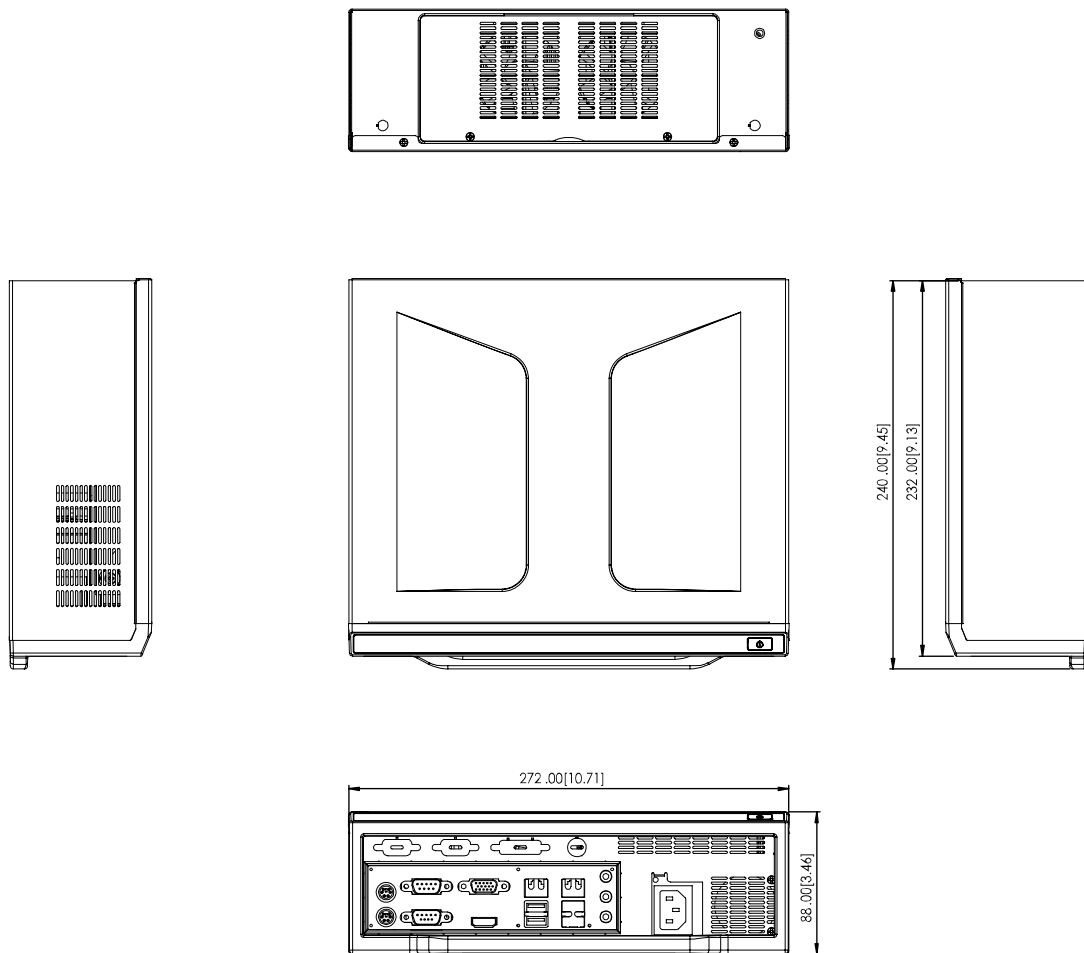


Figure 1.2 ARK-6620 Dimensions

1.6 Safety Precautions

Warning! Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.



Chapter 2


System Setup

This chapter shows how to set up the ARK-6610/6620. Sections include:

- Introduction
- Removing the Chassis Cover
- Removing the Disk Drive Housing
- Installing the Motherboard and I/O Shielding
- Installing Add-on Cards (ARK-6610 Only)
- Installing the Disk Drives
- Bottom Side Mounting
- Front Access I/O Interface Design
- Bottom Access Design

2.1 Introduction

The following procedures are intended to aid installation of motherboards, add-on cards and disk drives into the ARK-6610 (ARK-6620). Please also refer to Appendix A, Exploded Diagram, for all the parts of the ARK-6610 (ARK-6620).

Note!  Use caution when installing or operating the components with the chassis open. Be sure to turn off the power, unplug the power cord and ground yourself by touching the metal chassis before handling any components inside the machine.

2.2 Removing the Chassis Cover

Follow these steps to remove the top cover of ARK-6610 (ARK-6620).

1. Loosen the two thumb screws on the rear top of the chassis.
2. Remove the chassis top cover by gently sliding it backwards.

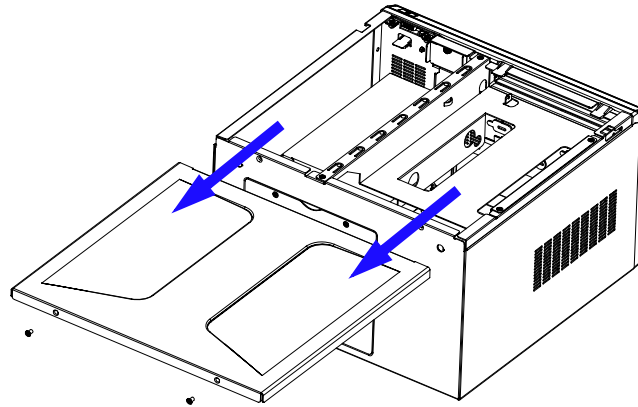


Figure 2.1 Removing the ARK-6610 cover

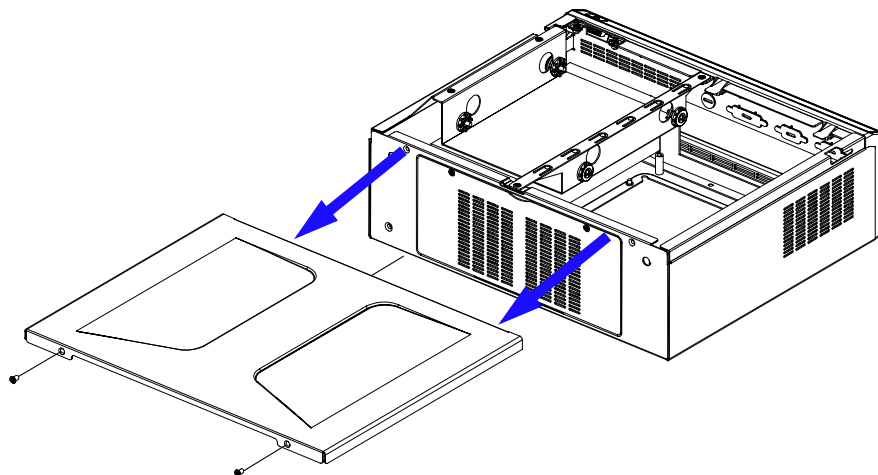



Figure 2.2 Removing the ARK-6620 cover

Note!  The ARK-6610 (ARK-6620) chassis is only compatible with Mini-ITX motherboards.

2.3 Removing the Disk Drive Housing

Follow these steps to remove the disk drive housing of ARK-6610 (ARK-6620).

1. Loosen the four thumb screws on the top of the disk drive housing.
2. Remove the housing by gently sliding it upwards.

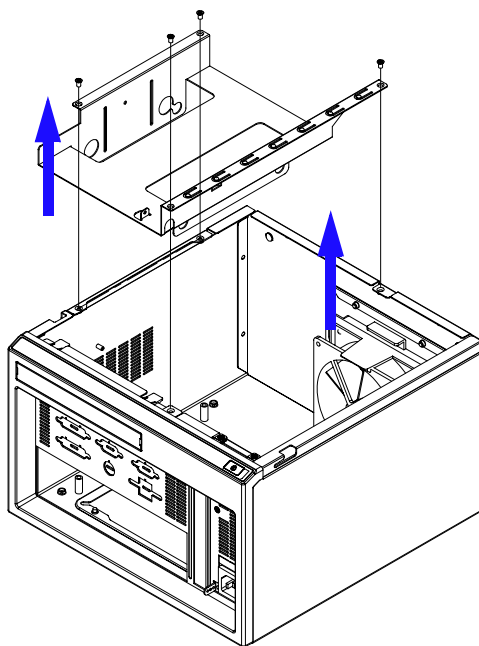


Figure 2.3 Removing the ARK-6610 disk drive housing

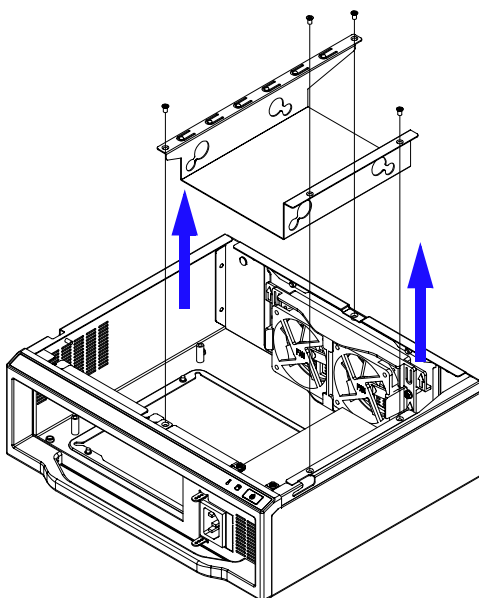


Figure 2.4 Removing the ARK-6620 disk drive housing

2.4 Installing the Motherboard and I/O Shielding

ARK-6610 (ARK-6620) supports Mini-ITX motherboards. To install the motherboard and I/O shielding of ARK-6610 (ARK-6620), refer to Figure 2.1 and then proceed as follows:

1. Insert the I/O shielding into the chassis.
2. Insert the motherboard into the chassis by gently sliding it downwards.
3. Fix the motherboard to the chassis with four thumb screws.

Note! Use caution when installing a motherboard. Advantech motherboards are highly recommended for optimum performance quality, safety and the airflow.

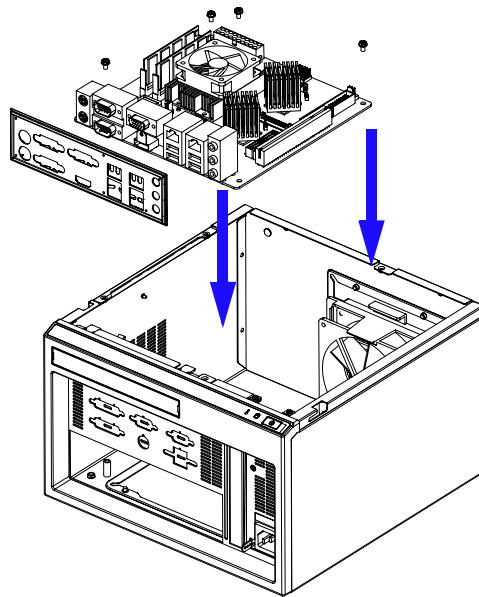


Figure 2.5 Installing the motherboard and I/O shielding into the ARK-6610

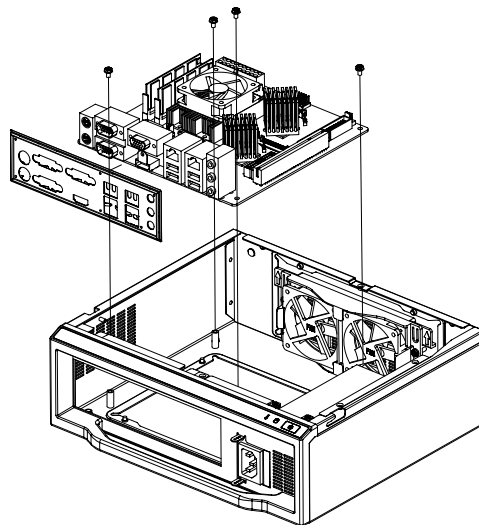


Figure 2.6 Installing the motherboard and I/O shielding into the ARK-6620

2.5 Installing Add-on Cards (ARK-6610 Only)

The ARK-6610 supports one add-on card with an Advantech mini-ITX motherboard. Follow these steps to install an add-on card:

1. Loosen the screw on the bracket clamp and remove the I/O bracket.
2. Insert an add-on card into the slot. Fasten the card with a screw on the top of the I/O bracket.

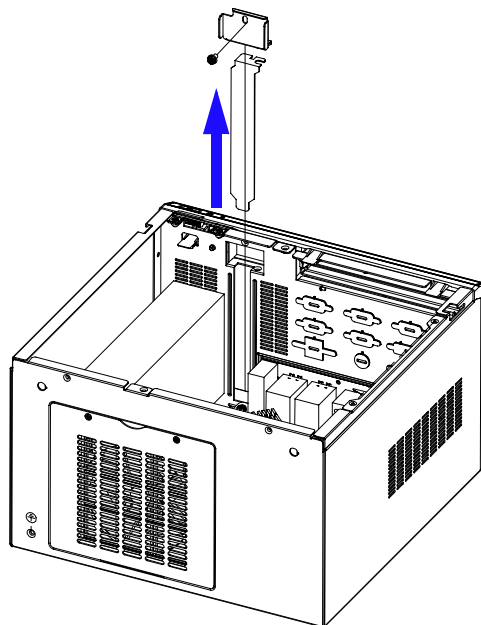


Figure 2.7 Loosening the bracket clamp and bracket

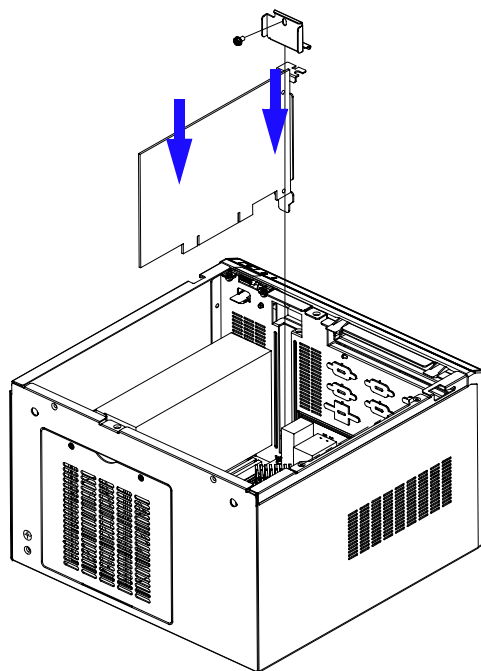
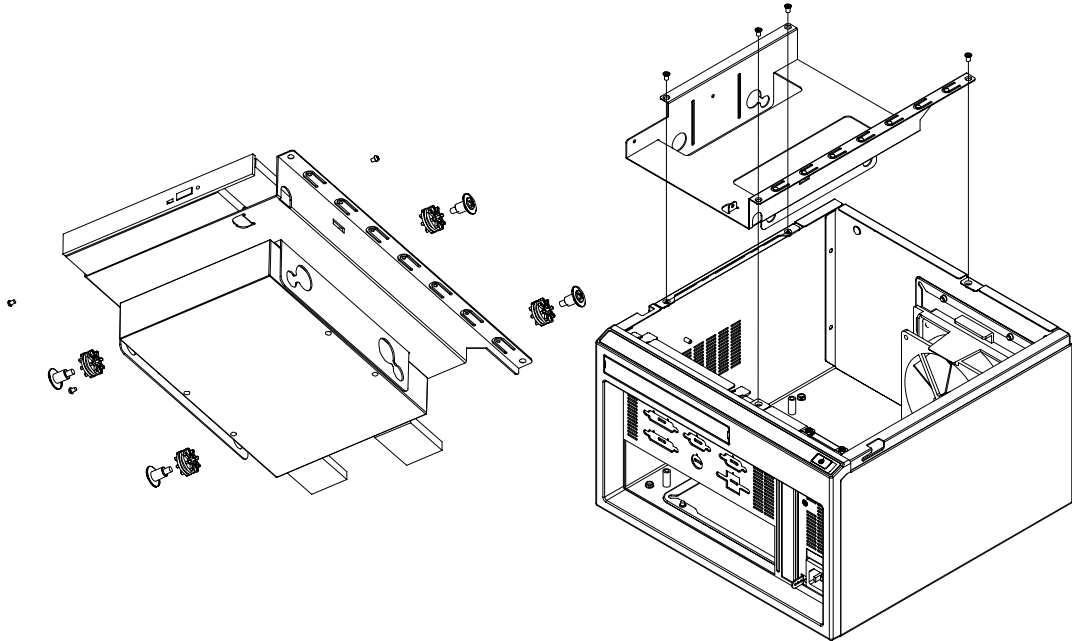


Figure 2.8 Installing and fastening the add-on card

2.6 Installing the Disk Drives

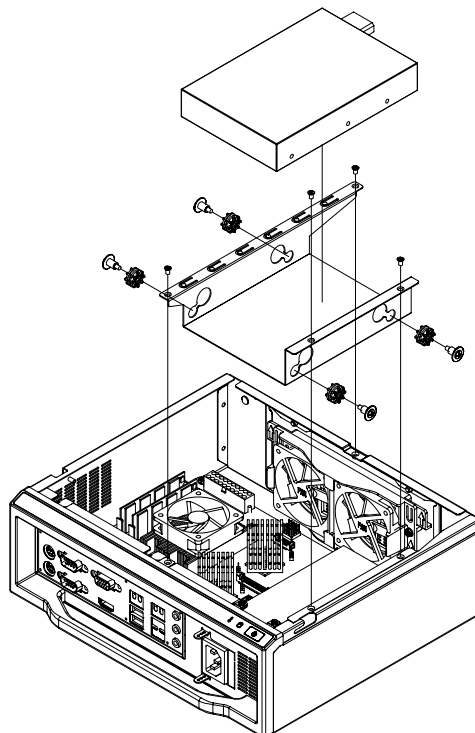
Follow these steps to install a slim CD-ROM, CD-R/W or DVD-ROM drive and a 3.5" HDD into ARK-6610:

1. Slide the slim CD-ROM into the upper layer of the disk drive housing.
2. Fasten the slim CD-ROM drive with three screws.
3. Slide the 3.5" HDD into the lower layer of the disk drive housing.
4. Place the four rubber dampers into the screws and then fasten the four screws onto the 3.5" HDD.



Follow these steps to install a 3.5" HDD into ARK-6620:

1. Slide the 3.5" HDD into the disk drive housing.
2. Place the four rubber dampers into the screws and then fasten the four screws onto the 3.5" HDD.



2.7 Bottom Side Mounting

The ARK-6610 (ARK-6620) has two accessory brackets for mounting on the bottom. These brackets permit users to mount the chassis onto most vertical and horizontal surfaces: a wall, a system panel, a workbench, a system housing, or a table.

Besides the above mounting method, the ARK-6610 (ARK-6620) can be placed on top of a desktop. In this case, affix the four supplied rubber pads on the chassis bottom, in alignment with the “L” marks.

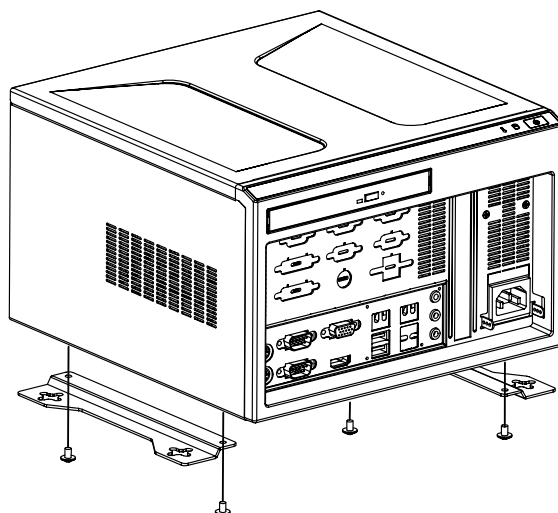


Figure 2.9 ARK-6610 bottom side mounting

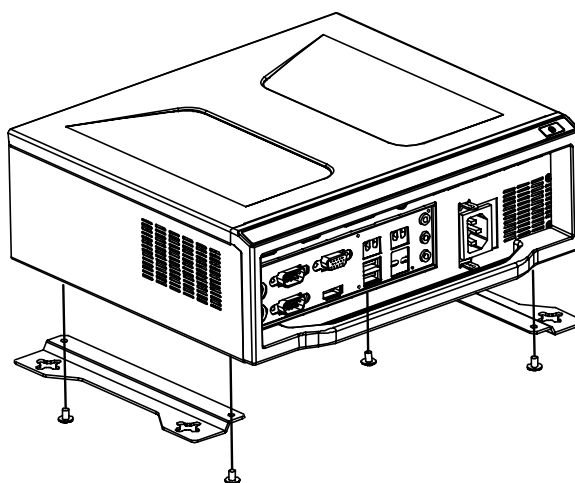


Figure 2.10 ARK-6620 bottom side mounting

2.8 Front Access I/O Interface Design

One of the unique design features of the ARK-6610 (ARK-6620) is that the I/O interface and expansion slots are located on the front of the chassis. This arrangement helps to eliminate most typical accessibility problems, and saves more space if the unit must be mounted on a wall or a workbench.

An added design feature is the convenience of the mounting brace for securing the power cord on the ARK-6610 (ARK-6620). Users can find the mounting brace in the accessory box.

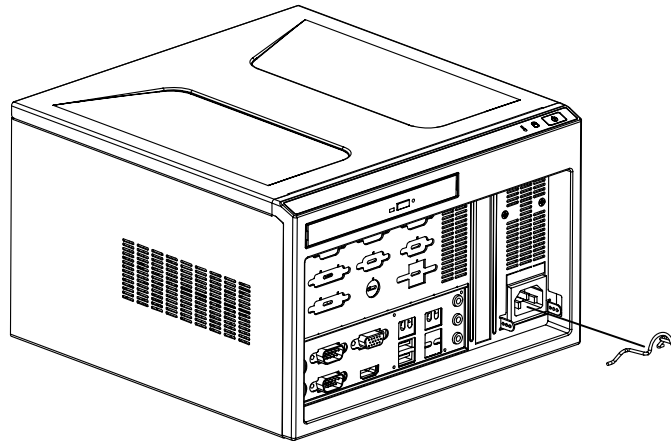


Figure 2.11 ARK-6610 mounting brace to secure a power cord

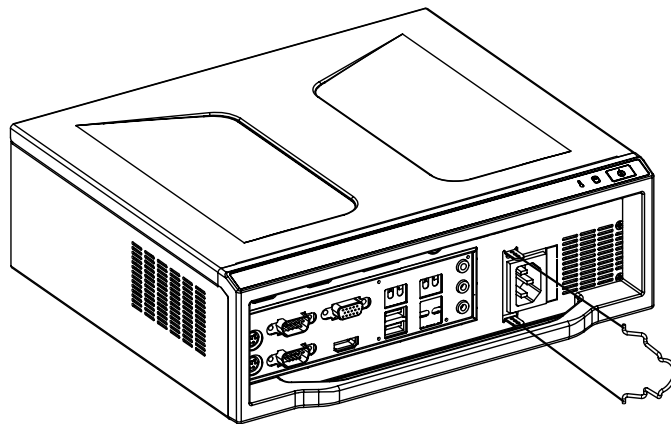


Figure 2.12 ARK-6620 mounting brace to secure a power cord

2.9 Bottom Access Design

The ARK-6610 (ARK-6620) is designed with one bottom access feature. This design feature enables convenient access to the solder side connectors of motherboard.

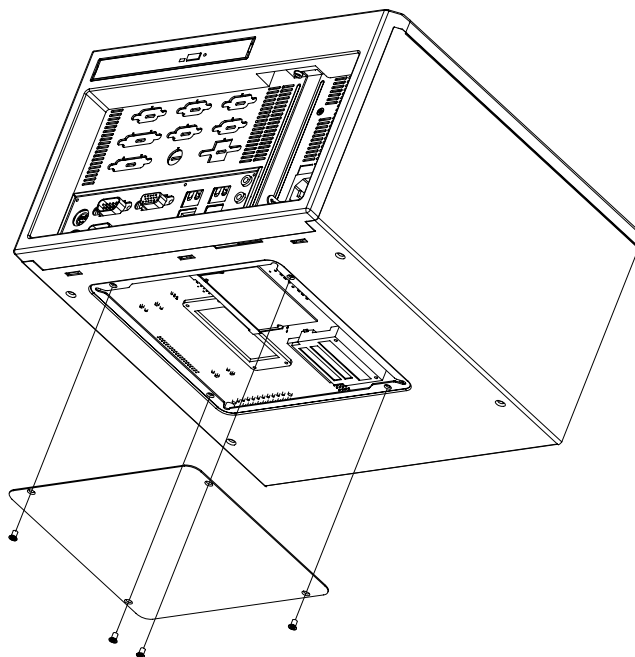


Figure 2.13 The bottom access of ARK-6610

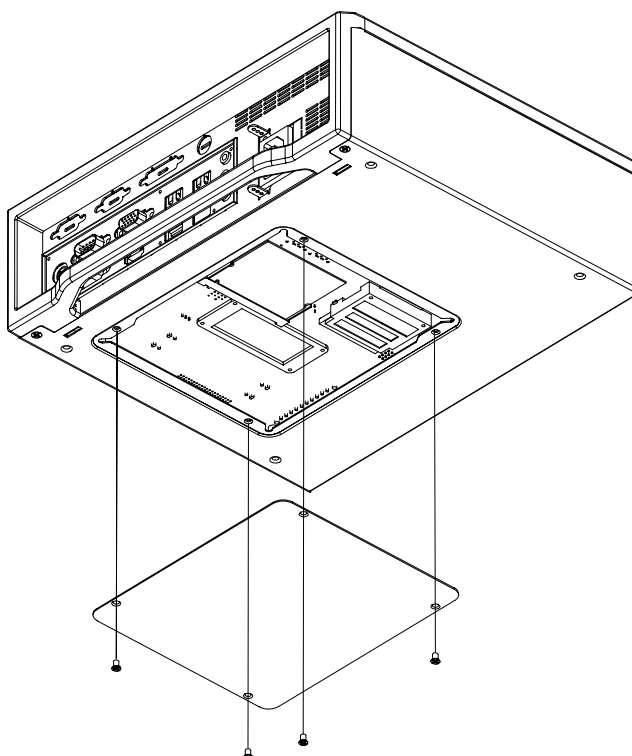


Figure 2.14 The bottom access of ARK-6620

Chapter 3

Operation

This chapter describes how to maintain the ARK-6610/6620. Sections include:

- About the Front Side
- Replacing the Cooling Fan
- Cleaning the Fan Filter
- Replacing the Power Supply

3.1 About the Front Side

On the front bezel, there is one Power On/Off switch and three LED indicators. Individual functions are described below.

3.1.1 Power Button

Press this button to turn on/off the system power. Please use system shutdown or press this switch for few seconds to turn off the system ATX power.

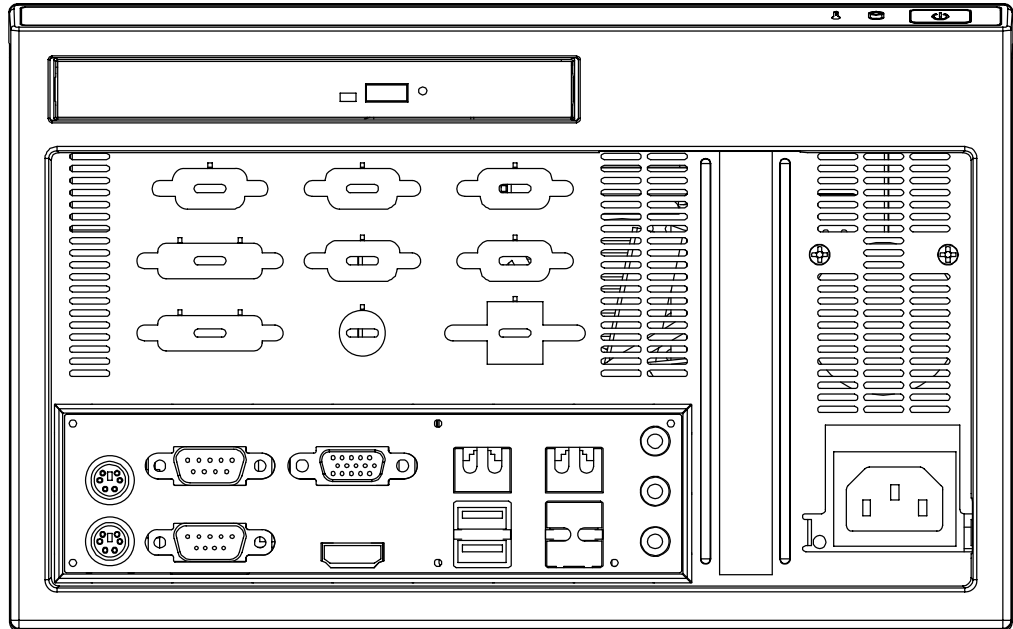


Figure 3.1 Front bezel of ARK-6610

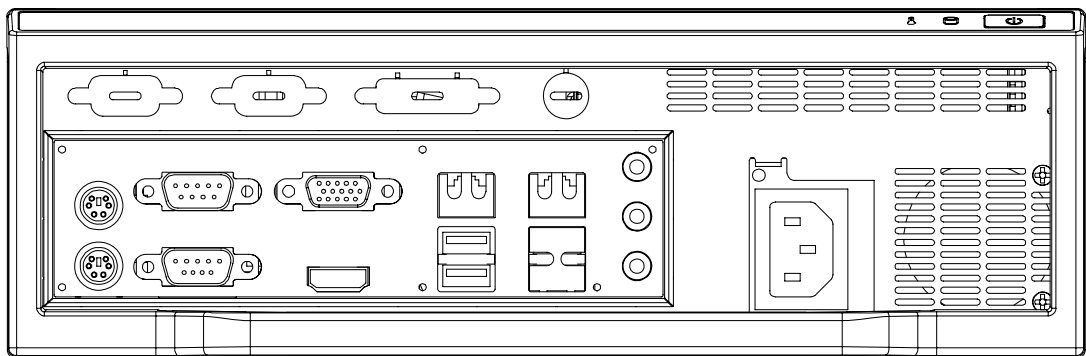


Figure 3.2 Front bezel of ARK-6620

3.1.2 Front Bezel

To remove the front bezel of ARK-6610 (ARK-6620), refer to Figure 2.1 and then proceed as follows:

1. Loosen the two screws on the top of the front bezel, and the two screws on the bottom (ARK-6620 only).
2. Loosen the three clips from the chassis.
3. Push out the bezel.

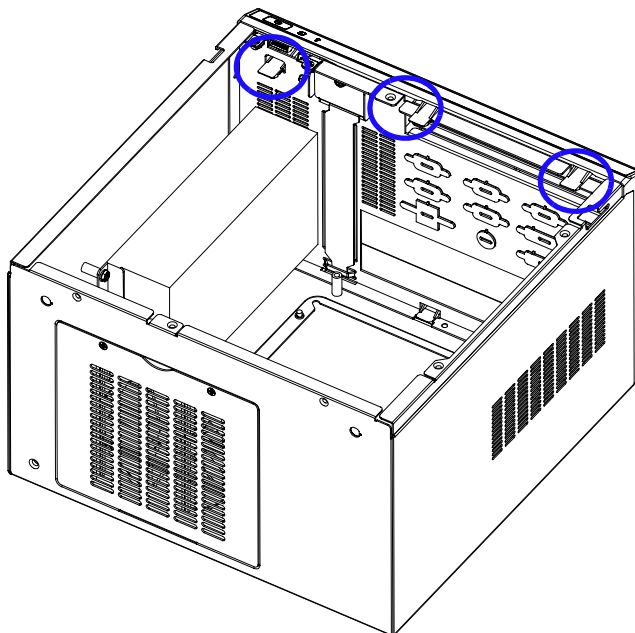


Figure 3.3 Loosening the clips of the ARK-6610 front bezel

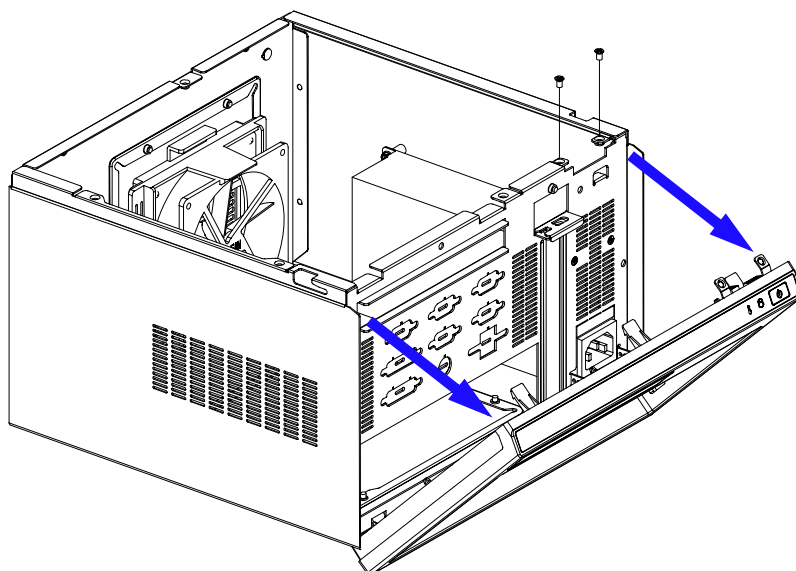


Figure 3.4 Removing the ARK-6610 front bezel

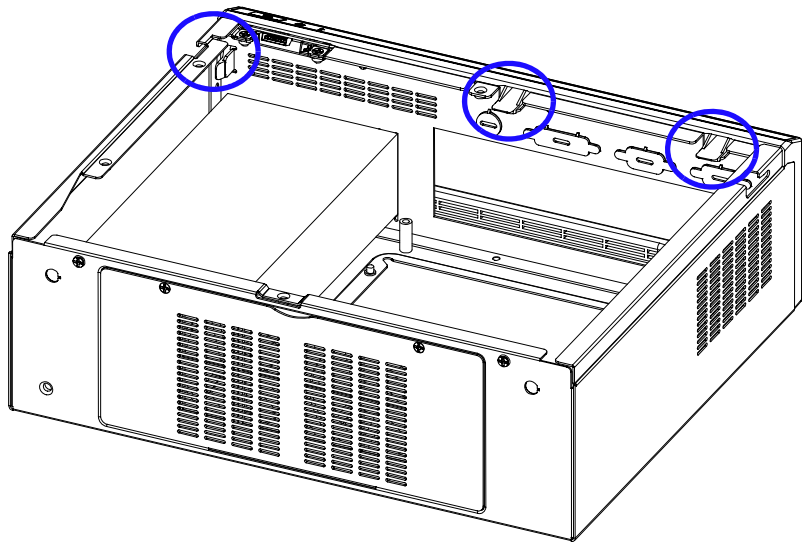


Figure 3.5 Loosening the clips of the ARK-6620 front bezel

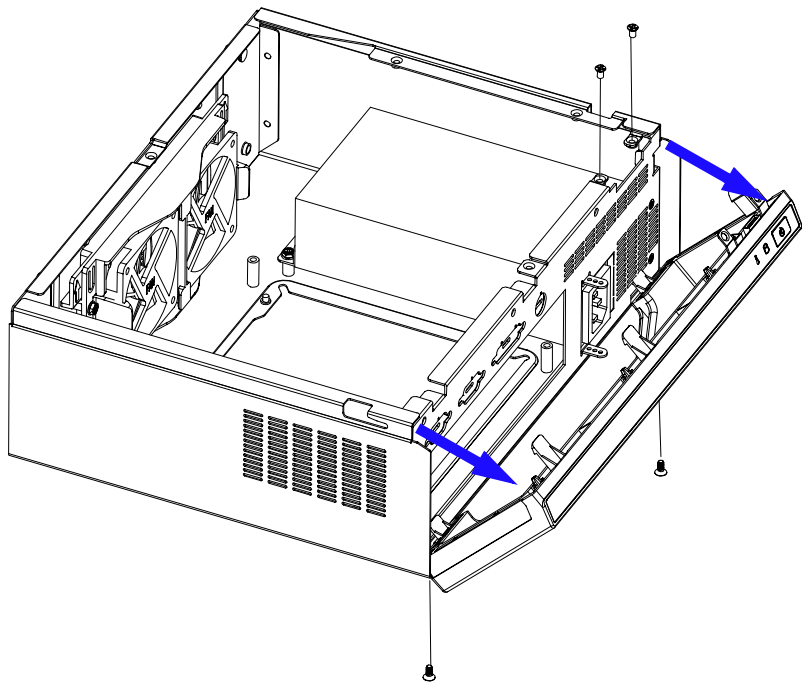





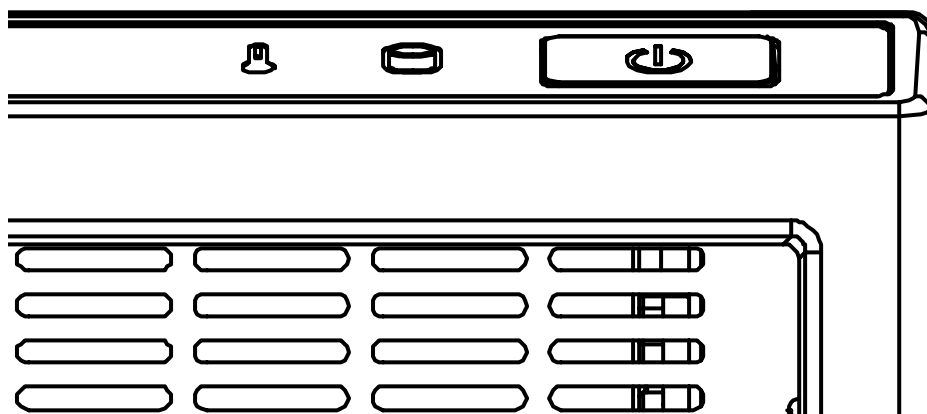
Figure 3.6 Removing the ARK-6620 front bezel

3.1.3 LED Indicators

Table 3.1: Definition of LED indicators

Icon	LED	Description	Blue	No light
	Power	Power	Normal	Off or failure
	HDD	Hard Disk	Reading	NO reading
	Temp	Over-heating	Normal	Over (Red)

- **Power LED:** Always blue when the system power is on
- **HDD LED:** Flashing blue during HDD data access
- **Temp LED:** Always blue when the internal temperature is under 50° C. When the internal temperature 60° C over, the Temp LED will turn red. The Temp LED will turn blue again when the internal temperature is under 50° C.



3.2 Replacing the Cooling Fan

The ARK-6610 and ARK-6620 cooling fans provide good airflow. Follow these steps to replace these fans:

1. Loosen the two screws of fan module on the rear side of the chassis and open the fan module.
2. Disconnect the fan's power connector from the motherboard or power supply.
3. Loosen the plastic clip on the fan module and remove the fan.
4. Place the new fan into the fan module.
5. Attach the fan's power connector to the motherboard or power supply.
6. Place the fan module into the chassis and then screw the two screws onto the rear side of the chassis.

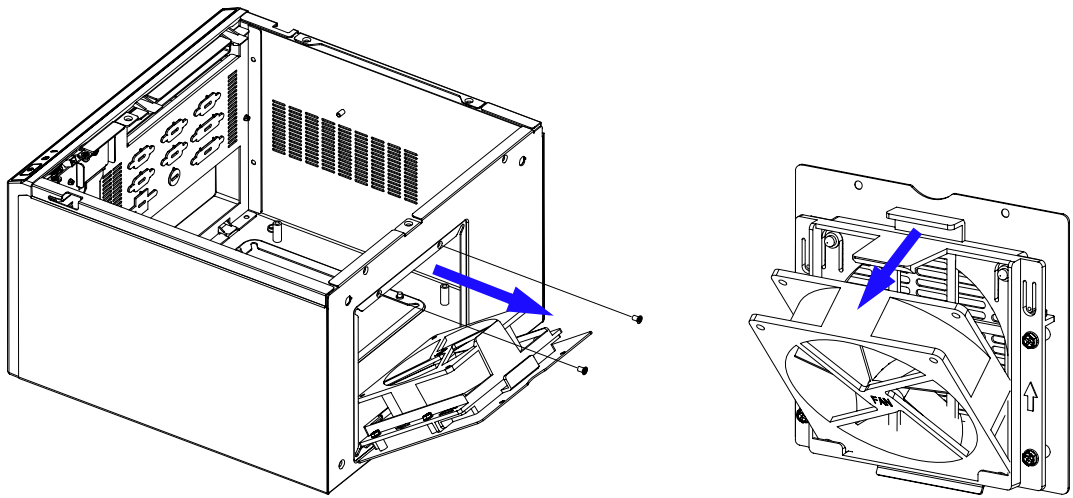


Figure 3.7 Replacing the 9cm fan for ARK-6610

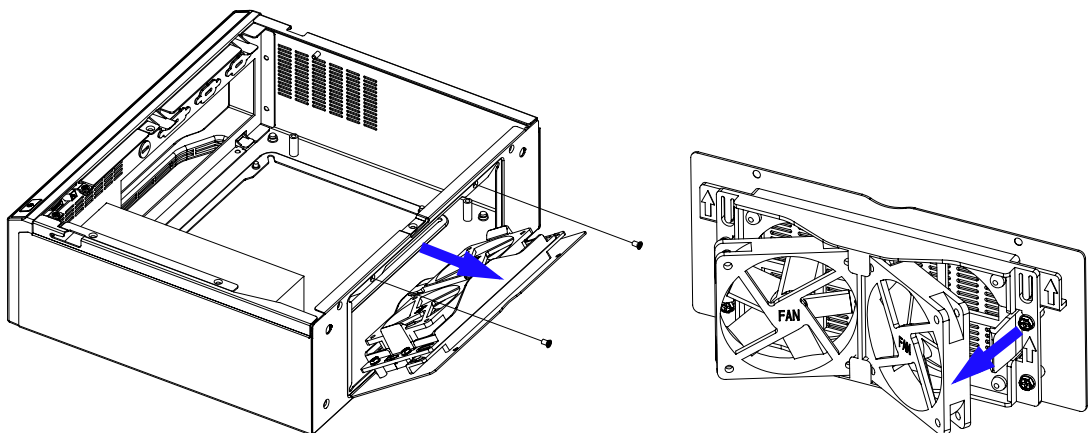


Figure 3.8 Replacing the two 6cm fans for ARK-6620

3.3 Cleaning the Fan Filter

The filter prevents dust or particles from entering the ARK-6610/6620 and extends longevity of the system. It's better to clean the filter periodically. There is one easy-to-maintain filter inside the fan module as illustrated. Follow these steps to clean the fan filter:

1. Remove the fan module as illustrated in section 3.2.
2. Pull out the fan filter by pushing the holder beside the filter as illustrated.
3. Clean the filter with a soft brush or wash the dust away from the filter with water and then dry it.
4. Put the filter back into the fan module.

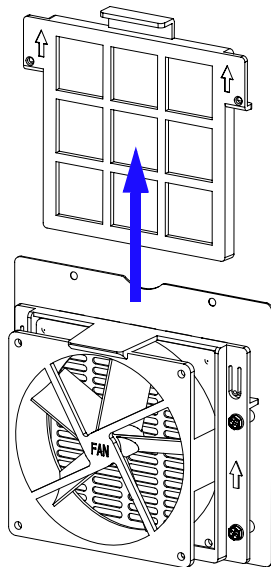


Figure 3.9 Remove the fan filter for ARK-6610

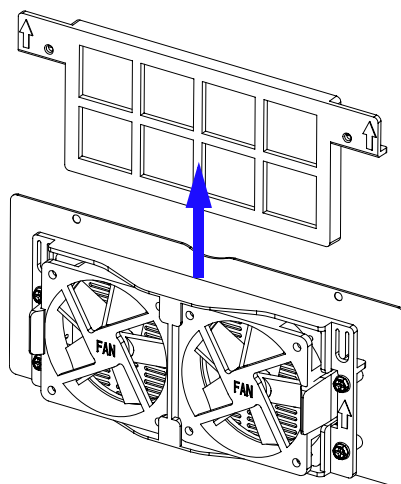


Figure 3.10 Remove the fan filter for ARK-6620

3.4 Replacing the Power Supply

The ARK-6610 (ARK-6620) supports a 1U-high ATX power supply. Follow these steps to change the power supply:

1. Unplug the AC inlet from the power supply.
2. Remove the chassis top cover and disk drive housing.
3. Unplug the all power connectors from the motherboard and the disk drives.
4. (Only for ARK-6620) Remove the front bezel as described in section 3.1.2.
5. Remove the two screws from the front of the chassis and remove the two screws from the inside of the chassis. Remove the power supply.
6. Insert the new power supply and fasten it to the chassis.
7. Plug the 20-pin ATX (or 24-pin) ATX power connector and 4-pin +12V power connector into the motherboard and plug the other power connectors into the disk drives and peripherals.
8. Replace the front bezel. Align the three clips on the bottom of the chassis first, and then tip the bezel into place on top. Gently push the top clips inside to re-attach the bezel to the chassis.
9. Replace the disk drive housing and the top cover.

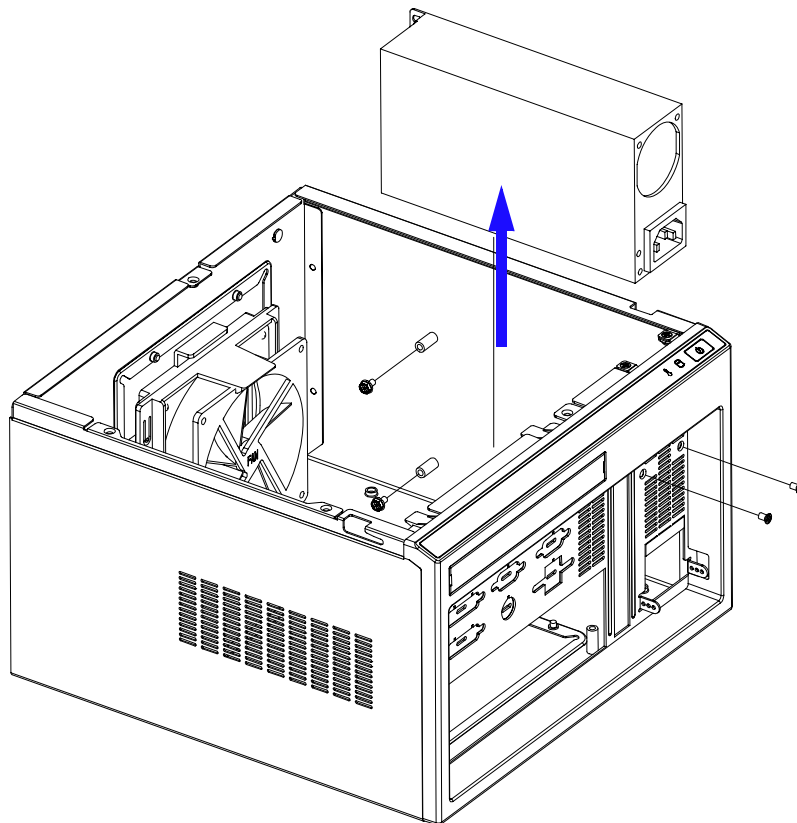


Figure 3.11 Remove the fan filter for ARK-6610

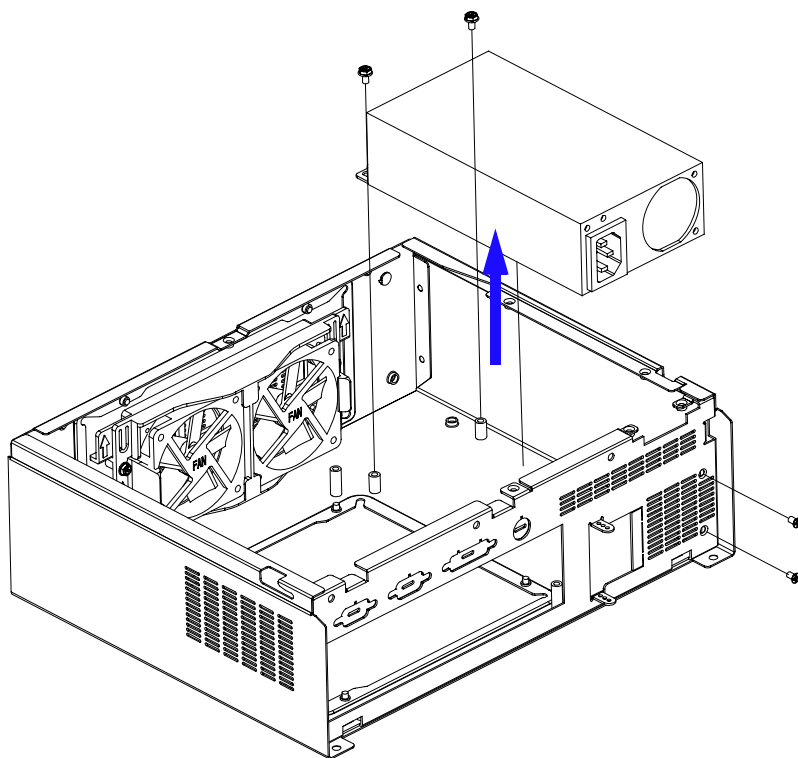


Figure 3.12 Remove the fan filter for ARK-6620

Appendix **A**

Exploded Diagrams

This appendix shows exploded diagrams of the ARK-6610/6620.

A.1 Exploded Diagrams

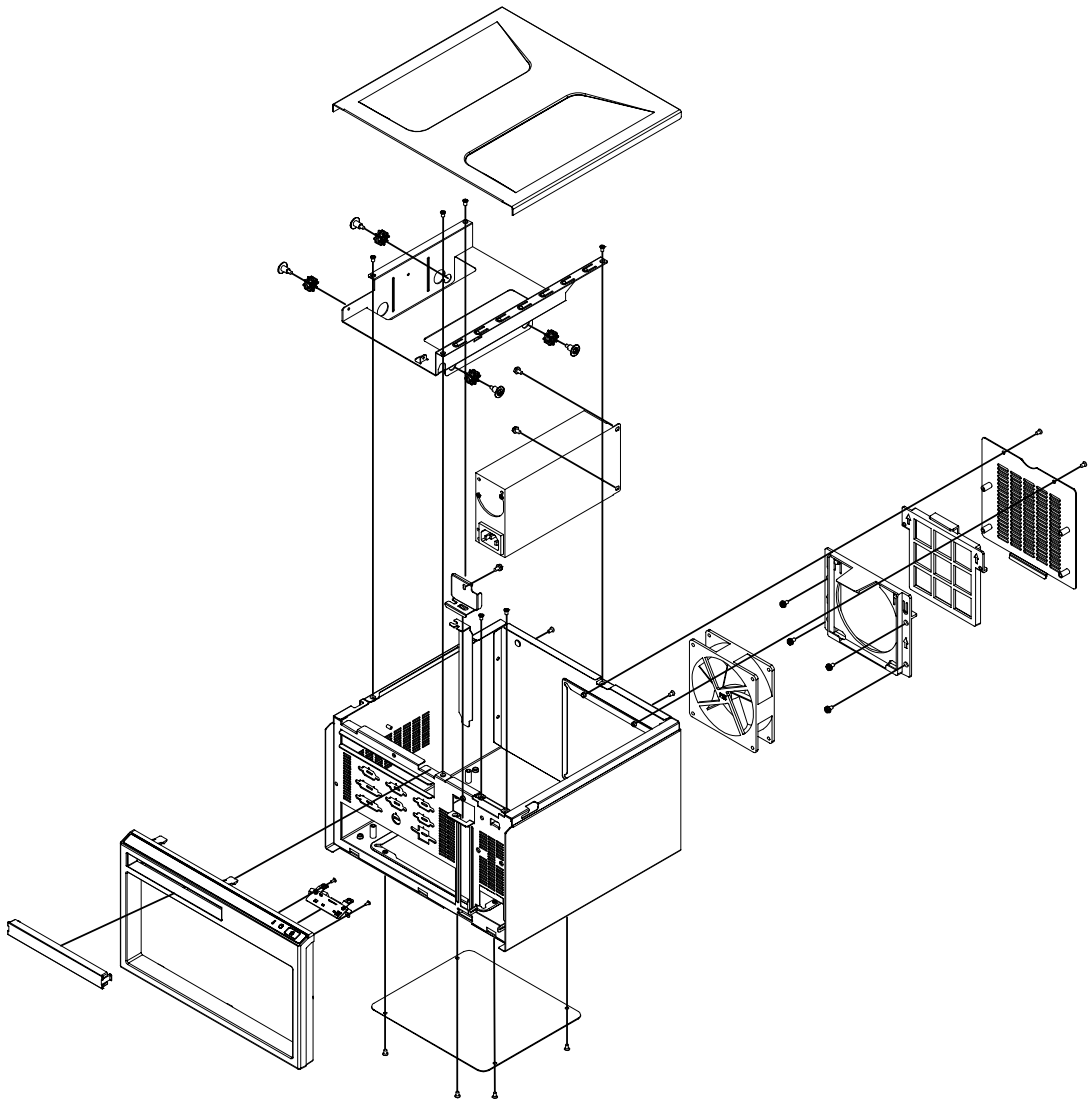


Figure A.1 Exploded Diagram of ARK-6610

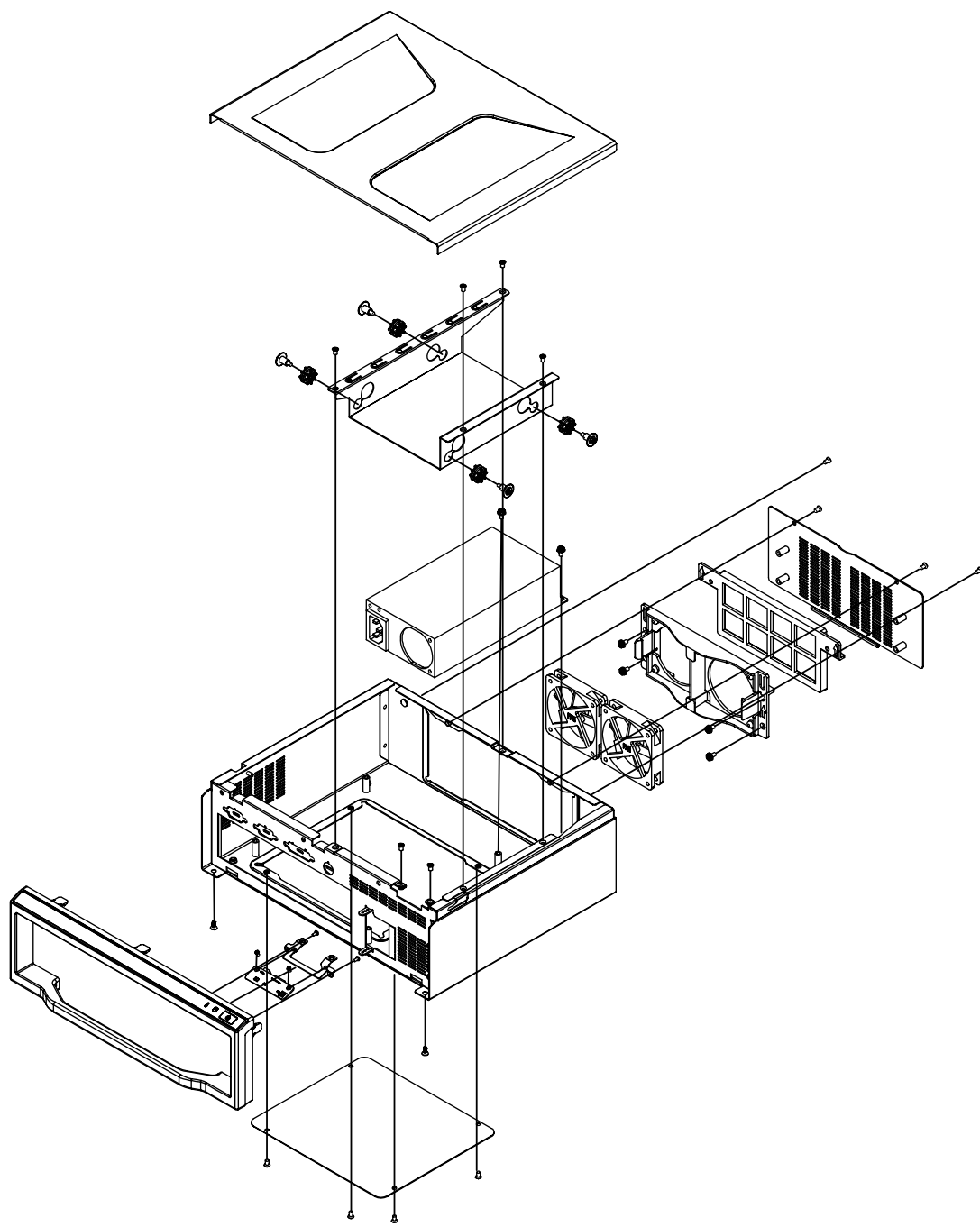


Figure A.2 Exploded Diagram of ARK-6620

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