ACP-4320

4U Height Industrial Chassis with Dual front accessible SATA HDD Trays for Easy Maintenance

User Manual

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Acknowledgements

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Advantech customer services

Each and every Advantech product is built to the most exacting specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new Advantech equipment is destined for the laboratory or the factory floor, you can be assured that your product will provide the reliability and ease of operation for which the name Advantech has come to be known. Your satisfaction is our primary concern. Here is a guide to Advantech's customer services. To ensure you get the full benefit of our services, please follow the instructions below carefully.

Technical support

We want you to get the maximum performance from your products. If you run into technical difficulties, we are here to help. For the most frequently asked questions, you can easily find answers in your product documentation. These answers are normally a lot more detailed than the ones we can give over the phone.

Please consult this manual first. If you still cannot find the answer, gather all the information or questions that apply to your problem, and with the product close at hand, call your dealer. Our dealers are well trained and ready to give you the support you need to get the most from your Advantech products. In fact, most problems reported are minor and are easily solved over the phone.

In addition, free technical support is available from Advantech engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products.

On-line Technical Support

For technical support and service, please visit our support website at:
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Product warranty

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.

If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

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

1. Collect all the information about the problem encountered. (For example, model no. of the product, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any on-screen 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 material 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 installing your backplane, please make sure that the following materials have been shipped:

- ACP-4320 Chassis

- User Manual

- Warranty Card

- Accessory box, including a pack of screws (for fixing backplane/motherboard and disk drives), a pair of keys, one EMI spring plate (bare chassis only), and some rubber cushions.

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the ACP-4320 mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt. As you unpack the ACP-4320, 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.

Contents

General Information

Chapter 1 General Information

1.1 Introduction

The ACP-4320 is a 4U-high rackmount industrial computer chassis designed for building mission-critical applications. With the latest industrial design on its outlook, the ACP-4320 breakthroughs the traditional, rigid impression of industrial PCs, and provides users with both a high-performance and a state-of-the-art operating platform.

Dual front-accessible SATA HDD trays for easy maintenance

The ACP-4320 is supplied with two front-accessible SATA HDD trays, which provide the most economic and user-friendly solution for data storage. Users may easily replace a SATA HDD without opening the chassis cover. Other data storage options include two 5.25" drive bays for optical disk drives and one 3.5" drive bay for floppy drive disk or internal 3.5" hard drive disk. Moreover, the front accessible USB interface can be connected with various peripheral devices for data input, backup, and transferal.

Unique alarm detection and notification to reduce system down time

The ACP-4320 has a unique alarm module. This module automatically detects the system operating conditions, such as power, HDD, FAN, as well as in-chassis temperature, and it may show the system status on the front LED indicators. If any failure happens, the module will also give an audible alarm to notify users to take necessary actions.

Versatile industrial features

The ACP-4320 supports both an ATX/mATX motherboard and an up to 15-slot backplane, to bring users the flexibility on system configuration planning.

It also provides a wide range of ATX power supply options for user selection: from 300W to 400W for both single and redundant power supply. The lockable front door prevents from any unauthorized access to data storage zone. Moreover, the streamlined in-chassis airflow design keeps the system cool, while the easy-to-maintain fans and filters shorten the system's MTTR (Mean Time to Repair). All these outstanding features make the ACP-4320 the best choice for price, performance and overall cost of ownership.

1.2 Specifications

General

- **Construction**: Heavy duty steel chassis
- **Disk drive capacity**: Two front-accessible mobile trays for 3.5" SATA HDDs, one 3.5" bay for FDD or internal HDD, and two 5.25" bays for optical disk drives
- **I/O interfaces on front panel**: two USB ports
- **I/O interfaces on rear panel**: (BP version) one D-Sub 9-pin opening; (MB version) five D-Sub 9-pin & one 68-pin SCSI openings
- **Indicators on front panel**: LEDs for Power On, HDD activity, TEMP, FAN activity and LAN connection
- **Switches on front panel**: Power On/Off, System Reset and Alarm Reset
- **Fans**: 1 x 114 CFM & 1 x 28 CFM
- **Weight**: 18.0 kg (39.6 lb)
- **Dimensions**: 482 mm (W) x 177 mm (H) x 478 mm (D) (19" x 7" x 18.8")

1.3 Environmental

- **Operating temperature**: 0 ~ +40°C (32°F ~ 104°F)
- **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) 1G rams (Non-operating) 2G
- **Shock**: (Operating) 10G with 11 ms duration, half sine wave (Non-operationg) 30G
- **Acoustic Noise**: < 54dB sound pressure at 5 ~ 28°C (41 ~ 82°F)
- **Altitude**: 0 to 3,048 m (0 ~ 10,000ft)
- **Safety**: CE compliant

1.4 Power supply options

1.4.1 300W ATX power supply with PFC (PS-300ATX-ZB)

- **Output rating**: 300 watts max.
- **Input rating**: 100 ~ 240 Vac @ 50 ~ 60 Hz (full range)
- **Output voltage**: +5 V @ 30 A, +3.3 V @ 28 A, +12 V @ 15 A, -5 V @ 0.3 A, -12 V @ 0.3 A, +5 VSB @ 2 A
- **Minimum load**: +5 V @ 0.1 A, +3.3 V @ 0.3 A
- **MTBF**: 100,000 hours @ 25° C, full load
- **Safety**: UL/cUL/TUV/CB/CCC

1.4.2 400W ATX power supply with PFC (PS-400ATX-ZB)

- **Output rating**: 400 watts max.
- **Input rating**: 100 ~ 240 Vac @ 47 ~ 63 Hz (full range)
- **Output voltage**: +5 V @ 35 A, +3.3 V @ 25 A, +12 V @ 30 A, -5 V @ 0.8 A, -12 V @ 1 A, +5 VSB @ 2 A
- **Minimum load**: +5 V @ 3 A, +3.3 V @ 1 A, +12 V @ 1 A, +5 VSB @ 0.1 A
- **MTBF**: 100,000 hours @ 25° C, full load
- **Safety**: UL/cUL/TUV/CB/CCC

1.4.3 300W ATX redundant power supply (RPS-300ATX-Z)

- **Output rating**: 300 watts max.
- **Input rating**: 100 ~ 240 Vac @ 50 ~ 60 Hz (full range)
- **Output voltage**: +5 V @ 25 A, +3.3 V @ 18 A, +12 V @ 16 A, -5 V @ 0.5 A, -12 V @ 0.5 A, +5 VSB @ 2 A
- **Minimum load**: +5 V @ 3 A, +3.3 V @ 1 A, +12 V @ 2 A, +5 VSB @ 0.1 A
- **MTBF**: 100,000 hours @ 25° C, full load
- **Safety**: UL/cUL/TUV/CB/CC

1.4.4 400W ATX redundant power supply (RPS-400ATX-Z)

- **Output rating**: 400 watts max.

- **Input rating**: 100 ~ 240 Vac @ 47 ~ 63 Hz (full range)

- **Output voltage**: +5 V @ 35 A, +3.3 V @ 25 A, +12 V @ 28 A, -5 V @ 0.5 A, -12 V @ 1.2 A, +5 VSB @ 2 A

- **Minimum load**: +5 V @ 3 A, +3.3 V @ 1 A, +12 V @ 2 A, +5 VSB @ 0.1 A

- **MTBF**: 100,000 hours @ 25° C, full load

- **Safety**: UL/cUL/TUV/CB/CC

1.5 Passive backplane options

The ACP-4320BP chassis accepts up to a 15-slot backplane. Here is a summary of the supported backplanes manufactured by Advantech

Table 1.1: PICMG 1.3 backplanes						
Model Name	Segment	Slots Per Segment				
		SHB*	PCIe x 16	PCIe x 8	PCI-X	PCI
PCE-7B13-64A1	1	1	-	2	6	4
PCE-5B12-64A1	1	1	1	-	6	4

* SHB: System Host Board

Table 1.2: PICMG 1.0 backplanes						
Model Name	Segment	Slots Per Segment				
		PICMG	PICMG /PCI	PCI	PCI/ ISA	ISA
PCA-6114-0B1	1	-	-	-	-	14
PCA-6115-0B1	1	-	-	-	-	15
PCA-6113P4R-0C1	1	2	-	4	-	7
PCA-6114P7-0D2	1	3	-	6	1	4
PCA-6114P10-B	1	2	-	10	-	2
PCA-6114P12-0B2	1	1	1	11	-	1
PCA-6113P7X	1	2	-	7 (64-bit)	-	4
PCA-6114P12X-A1	1	1	1	11 (64-bit)	-	1
PCA-6113DP4-0A1	2	3	1	7	-	2

Please contact Advantech local sales representative for detailed backplane information.

1.6 Dimensions of ACP-4320
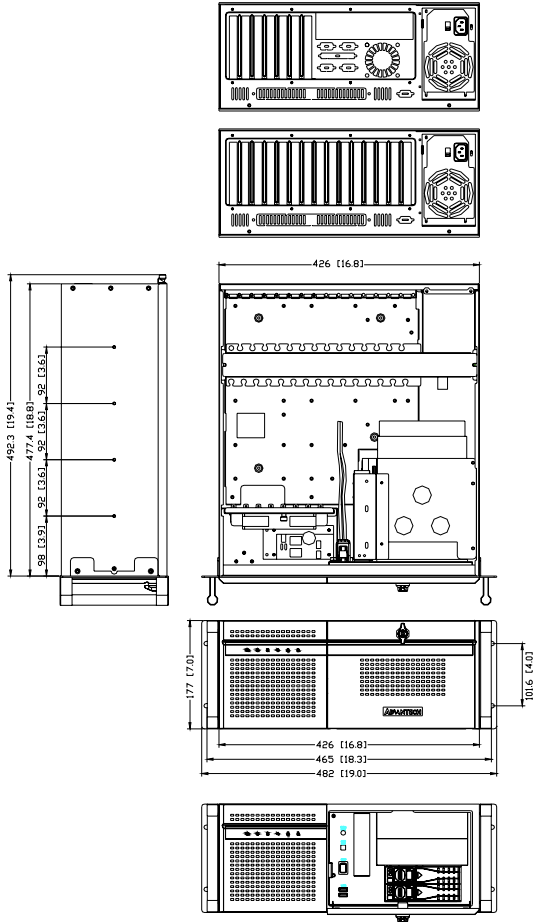
Figure 1.1: Dimensions of ACP-4320

1.7 Ordering information

Table 1.3: ACP-4320 model list

Part Number	Power Supply	Motherboard/ Backplane	Regulation
MB Version			
ACP-4320MB-00X	Without power supply, with ATX switch	Not included	None
ACP-4320MB-30Z	PS-300ATX-ZB	Not included	CE
ACP-4320MB-40Z	PS-400ATX-ZB	Not included	CE
ACP-4320MB-30R	RPS-300ATX-Z	Not included	CE
BP Version			
ACP-4320BP-00X	Without power supply, with ATX switch	Not included	None
ACP-4320BP-30Z	PS-300ATX-ZB	Not included	CE
ACP-4320BP-40Z	PS-400ATX-ZB	Not included	CE
ACP-4320BP-30R	RPS-300ATX-Z	Not included	CE

System Setup

Chapter 2 System Setup

The following procedures are provided to assist you in installing a motherboard (or backplane), disk drives, and plug-in cards into the ACP-4320. Please also refer to the Appendix A, Exploded Diagram, for the parts naming in this manual.

2.1 System installation

To remove the cover of the ACP-4320, please refer to Figure 2.1.

Figure 2.1: Removing the cover

Note: The ACP-4320 accepts either an ATX/ microATX motherboard (model P/N: ACP-4320MB) or an up to 15-slot backplane (model P/N: ACP-4320BP). If you have purchased an ACP-4320MB chassis, please refer to Sect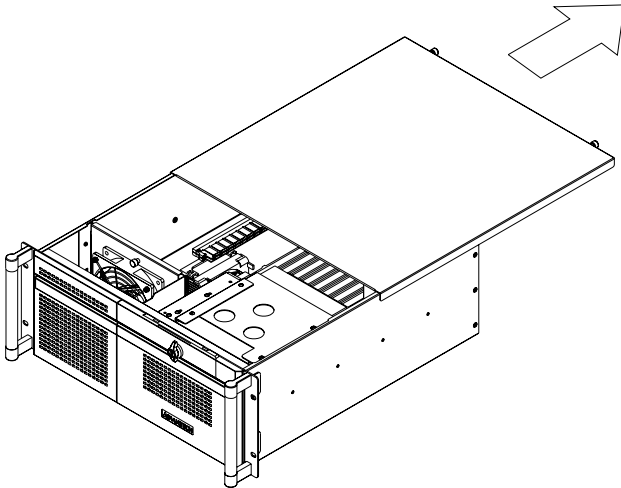ion 2.2 for the instructions to install an ATX/microATX motherboard; otherwise, please refer to Section 2.3 to install a backplane and a CPU card.

2.2 Installing motherboard

The ACP-4320MB accepts both an ATX and a microATX motherboard. To install a motherboard, please proceed as follows:

1. Remove the two screws, which mount the hold-down clamp to the ACP-4320MB chassis, then take out the hold-down clamp.

2. Find the yellow label (shown as Table 2.1) on the upperplate of the ACP-4320MB chassis. This label instructs where to screw the copper stubs on the upperplate, based on the to-be-installed backplane and motherboard. Get the copper stubs from the accessory box of the ACP-4320MB packing, and follow the table to screw the copper stubs on the proper locations on the upperplate.

Table 2.1: Copper stub location for motherboard/backplane

MB \ Nut # Backplane	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	X	A	M
PCA-6113P4R PCA-6114P7 PCA-6114P12	*	*	*	*	*		*	*	*	*	*	*	*	*			*	*	*	*												
PCA-6114P4 PCA-6114P10 PCA-6113DP4	*	*	*	*	*		*	*	*	*	*	*	*	*			*	*		*												
PCA-6114-B	*	*	*	*	*		*	*	*	*	*	*	*	*																		
PCA-6113P7X	*	*	*	*	*		*	*			*	*		*			*		*		*	*		*				*				
PCA-6115	*	*	*	*	*			*	*	*	*	*	*																			
PCA-6114P12X	*	*	*	*	*		*	*	*			*		*			*		*		*	*		*				*				
PCE-7B13-64 PCE-5B12-64	*	*	*	*	*		*		*	*		*		*			*	*		*							*	*				
AIMB-740 AIMB-741 AIMB-742	*	*	*				*		*		*			*																		
AIMB-744 AIMB-750 AIMB-760	*	*	*				*				*			*			*	*														
AIMB-762	*	*	*				*		*		*			*			*	*														
AIMB-554 AIMB-560		*	*				*				*			*					*													*

Be careful to screw the Copper Stub *no more than* **10 kgf • cm.**

3. Refer to Figure 2.2, and, from inside of the chassis, attach the motherboard I/O shield to the rear plate of the chassis.

4. Check all devices, such as CPU, CPU cooler and RAMs and make sure they have been installed on the motherboard properly.

5. Refer to Figure 2.2, place the motherboard into the chassis, and fix it with screws.

6. Plug in the 20- or 24-pin ATX power connector and +12 V power connector from the power supply.

7. Connect the wires for the POWER switch, RESET switch, and the front USB from the motherboard to the front panel of the chassis.

8. Connect the wires for the POWER LED, HDD LED and LAN LED from the motherboard to the small LED board, which is attached to the front panel of the chassis.

> **Note:** All Advantech's industrial ATX/microATX motherboards support the front USB function. However, only the AIMB-750, 760, 762, 560 and the later industrial motherboards support the front LAN LED function.
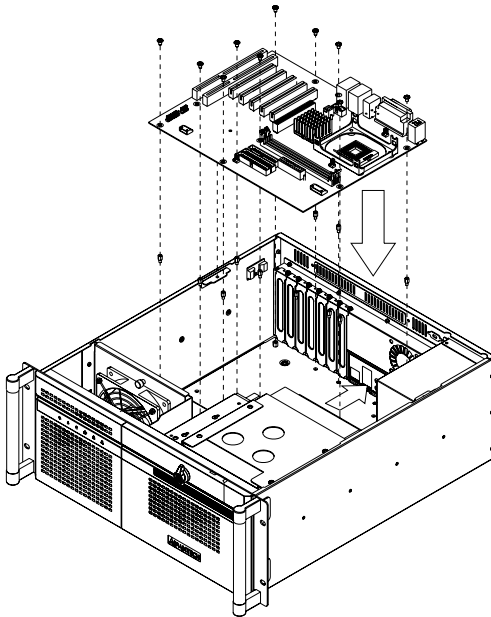

Figure 2.2: Installing a motherboard

2.3 Installing passive backplane & CPU card

The ACP-4320BP accepts an up to 15-slot backplane. To install a backplane and a CPU card, proceed as follows:

2.3.1 Installing the backplane

1. Remove the two screws, which mount the hold-down clamp to the ACP-4320BP chassis, then take out the hold-down clamp.

2. Find the yellow label (shown as Table 2.1) on the upperplate of the ACP-4320BP chassis. This label instructs where to screw the copper stubs on the upperplate, based on the to-be-installed backplane and motherboard. Get the copper stubs from the accessory box of the ACP-4320BP packing, and follow the table to screw the copper stubs on the proper locations on the upperplate.
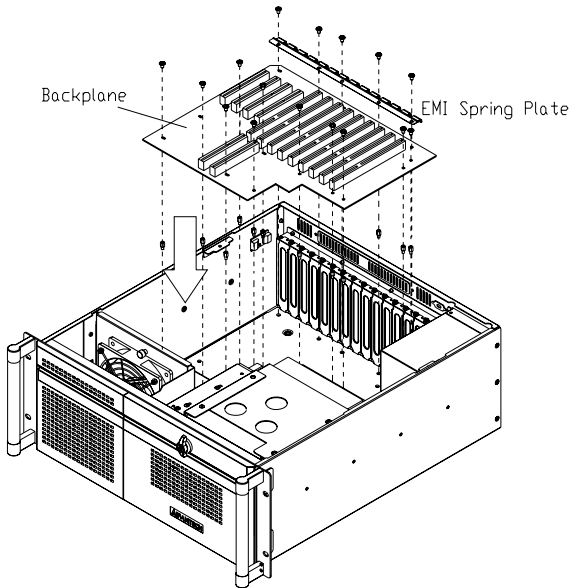

Figure 2.3: Installing a backplane

3. Refer to Figure 2.3, carefully place the backplane and the EMI spring plate into the ACP-4320BP chassis. For the bare ACP-4320BP chassis, the EMI spring plate is stored in the accessory box.

4. Fix the backplane with screws.

2.3.2 Installing the CPU card

1. Before installing the CPU card, check all devices, such as CPU, CPU cooler and RAMs and make sure they have been installed on the CPU card properly.

2. Carefully insert the CPU card in a PICMG slot. Make sure that the card bracket has been inserted properly and the other edge of the card has been fixed in the guiding rail. Fasten the card at the top of the bracket with a screw.

3. Plug in the 24- or 20-pin ATX power connector to the backplane, and the +12 V power connector to the CPU card (or backplane).

4. Connect the wires for the POWER switch, RESET switch, and the front USB from the CPU card to the front panel of the chassis.

5. Connect the wires for the POWER LED, HDD LED and LAN LED from the CPU card to the small LED board, which is attached to the front panel of the chassis.
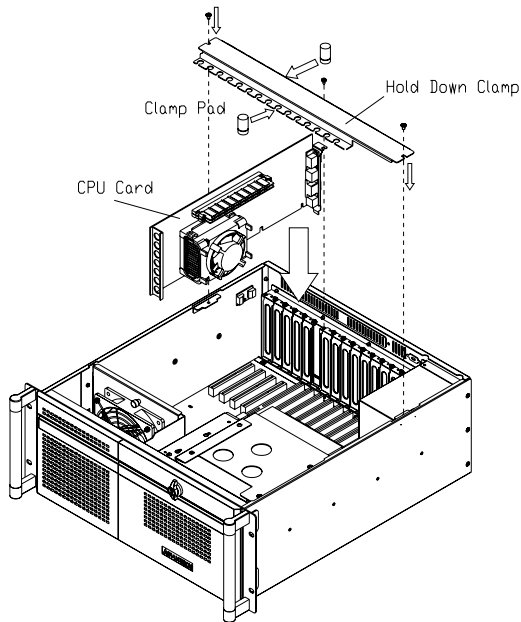

Figure 2.4: Installing the CPU card

Note: *Most of Advantech's full-sized CPU cards support the front USB function. However, only the PCA-6184-B, PCA-6186-B, PCA-6188, PCA-6190 and the later full-sized CPU cards support the front LAN LED function.*

2.4 Installing plug-in cards

To install a plug-in card, please proceed as follows:

1. Find the slot(s) which is go to be inserted a card(s), and remove the slot's blank bracket(s) attached to the rear plate of the chassis.

2. Insert a plug-in card. Make sure that the card bracket has been inserted properly and the other edge of the card has been fixed in the guiding rail. Fasten the card at the top of the bracket with a screw.

3. Repeated Step 2 if there is more than one card.

5. Insert the clamp pad(s) into the hold-down clamp. The clamp pads cushion the plug-in cards from shock and vibration. The hold-down clamp has two rows of notches for the pads to be inserted, one row is for PCI cards, the other row for ISA cards. Depending on the card height, the buffers can be inserted as the narrow end face upwards or downwards.

6. After inserting the clamp pads, return the hold-down clamp and fasten it with screws.

2.5 Installing disk drives

The ACP-4320 comes with two front-accessible SATA HDD trays; it also accepts two 5.25" disk drives and one 3.5"flppy disk drive or an internal SATA/ATA hard disk drive.

> ***Note:***   *For the first time to install all disk drives together into the ACP-4320 chassis, we suggest users to install the two 5.25" disk drives (refer to Section 2.5.1) first, then the 3.5" floppy disk drive (refer to Section 2.5.2) or internal 3.5" hard disk drive (refer to Section 2.5.3), and finally, the dual SATA hard disk drives into the front-accessible SATA HDD trays (refer to Section 2.5.4).*

> ***Note:***   *The ACP-4320's dual front-accessible SATA HDD trays do not support the hot swappability feature. To fulfill this feature, it is necessary to use a SATA RAID card.*
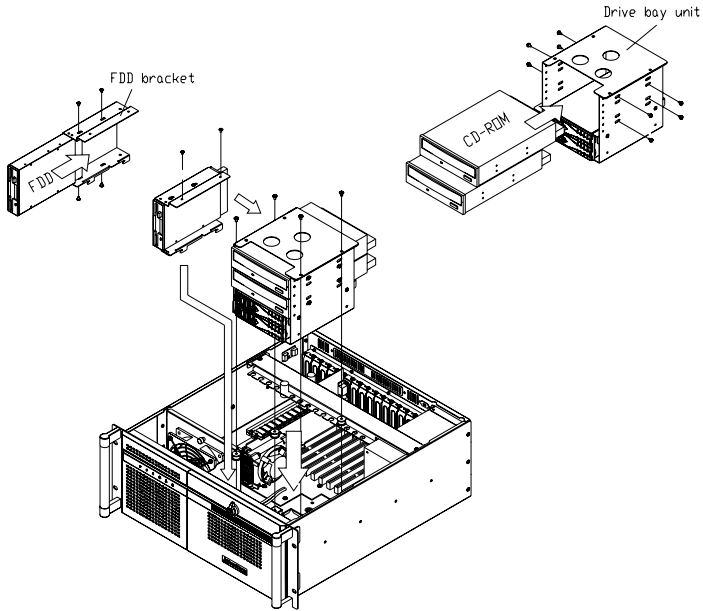
Figure 2.5: Installing the drives

2.5.1 Installing a 5.25" disk drive

1. Remove the two screws, which mount the FDD bracket to the drive bay unit.

2. Remove the four screws, which mount the drive bay to the chassis, then take out the drive bay.

3. Remove the cover of one 5.25" drive bay. Insert one 5.25" disk drive (e.g., 5.25" CD-ROM/-RW) into the proper location in the drive bay and fix it with four screws.

4. Connect a 40-pin flat cable from the CPU card/motherboard to the CD-ROM.

5. Plug in a peripheral power connector from the power supply to the CD-ROM.

6. Repeat Steps 3 ~ 5 if there is more than one drive.

7. Return the drive bay unit into the ACP-4320 chassis and fix it with the four screws.

2.5.2 Installing a 3.5" floppy disk drive

1. Remove the cover of one 3.5" drive bay.

2. Insert one 3.5" floppy disk drive into the proper location in the FDD bracket and fix it with four screws.

3. Attach the FDD bracket to the drive bay unit and fix it with two screws.

4. Connect a 34-pin flat cable from the CPU card/motherboard to the floppy disk drive.

5. Plug in a floppy drive power connector from the power supply to the floppy disk drive.

2.5.3 Installing an internal hard disk drive in the 3.5" drive bay

1. Insert one 3.5" hard disk drive into the proper location in the FDD bracket and fix it with four screws.

2. Attach the FDD bracket to the drive bay unit and fix it with two screws.

3. Connect a 40-pin flat cable from the CPU card/motherboard to an ATA (IDE) hard disk drive or a SATA cable to a SATA hard disk drive.

4. Plug in a peripheral power connector from the power supply to the hard disk drive.

2.5.4 Installing a SATA HDD in the front-accessible SATA HDD tray

ACP-4320 accepts both SATA and SATA II HDD. It is not necessary to remove ACP-4320's upper cover when installing a SATA HDD in any of the front-accessible SATA HDD trays.

1. Left-shift the key latch of one SATA HDD tray to unlock the tray. Hold the handle of the tray and draw it out from ACP-4320 chassis.

2. Refer to Figure 2.6 and slide one SATA hard disk drive into the proper location in the tray and fix it with 4 ~ 6 screws.
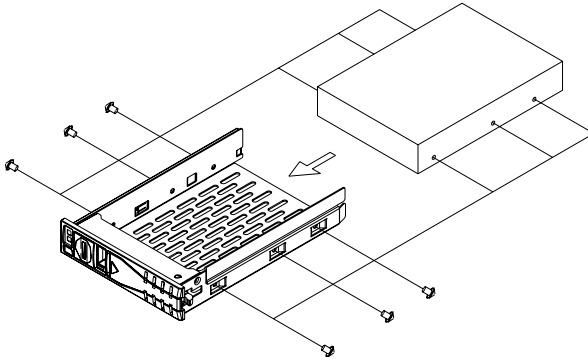

Figure 2.6: Installing a SATA HDD

3. Return and push the SATA tray into the chassis until the handle of tray is moving back. Right-shift the key latch of the HDD tray to lock the tray.

4. Repeat Steps 1 to 3 if there is the 2nd SATA HDD to be installed.

Operation

3.1 The Front Section of ACP-4320

3.1.1 Switches
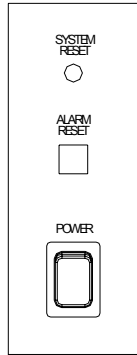
Figure 3.1: The Switches on the front panel

Three switches are located on the front plate, behind the front door.

These switches are used for system power on-off, system reset and alarm reset.

System Reset Switch: Press this switch to reinitialize the system.

Alarm Reset Switch: Press this switch to suppress or stop an audible alarm. Whenever a fault in the system occurs (e.g., fan failure, or a too high in-chassis temperature), an audible alarm is activated. Pressing this switch will cause the alarm to stop.

Power On-Off Switch: Use this switch to turn on/off the system power.

3.1.2 LED indicators

Figure 3.2: The LEDs on the front panel

Six LEDs (shown as Figure 3.2) are placed on the front panel of the ACP-4320 chassis to indicate the system health and activity. Please refer to Table 3.1 for the LED definition summary.
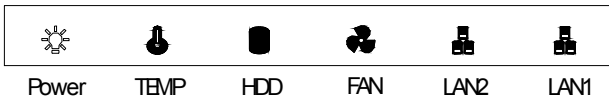
Table 3.1: LED definition summary			
LED	**Description**	**Green**	**Red**
Power	System Power	Normal	Abnormal
TEMP	In-Chassis Temperature	Normal	Abnormal
HDD	Hard Disk Drive Activity	Data Access	No light
FAN	Cooling Fan Status	Normal	Abnormal
LAN1 LAN2	LAN Connection	Link: Blinking only when Data Transition	No light

If the system is connected with a single PS/2 power supply (e.g., PS-300ATX-ZB), the **Power LED** is always *Green* when power on.

When the **PWR LED** is *RED*, it indicates a redundant power supply (e.g., RPS-300ATX-Z) failure. To stop the alarm buzzer, press the **Alarm Reset** button. Then, check out the redundant power supply right away and replace the failed power supply module with a good one.

If the **TEMP LED** is *RED and blinking*, it means that the system detects over high temperature in the chassis. An audible alarm is activated. To stop the alarm buzzer, press the **Alarm Reset** button. Inspect the fan filter and the rear section of the chassis immediately. Make sure airflow inside the chassis is smooth and not blocked by dust or other particles.

When the **HDD LED** is *Green and blinking*, it indicates some data is written into or read from the HDD. When it becomes no light, it indicates

no data write/read is under proceeding.

When the **FAN LED** is *RED and blinking*, it indicates a failed cooling fan, and the alarm buzzer is also activated. To stop the alarm buzzer, press the **Alarm Reset** button, and replace the failed fan immediately.

When the **LAN1/2 LED** is *Green*, it indicates the LAN is linked but no data is transmitted via the LAN. When it turns into blinking, it indicates some data is transmitted via the LAN.

3.2 Replacing the fans

There are one fan behind the front plate of ACP-4320 chassis and one fan behind the SATA drive bay. To replace either of the fans, please refer to Figure 3.3 and proceed as follows:
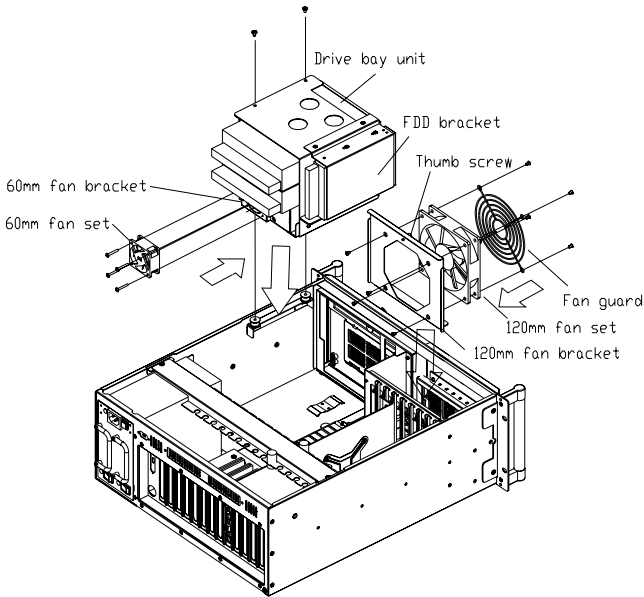

Figure 3.3: Changing the fans

3.2.1 Replacing the 120 mm fan behind the front panel

1. Un-plug the fan power connector.

2. Remove the thumb screw, which fixes the fan bracket to the chassis and lift it with two fingers.

3. Remove the four screws, which mount the failed fan to the fan bracket, and take out the fan.

4. Remove the four screws, which mount the fan guard to the failed fan, and take out the fan guard.

5. Get a new fan. Place the fan guard on the new fan and fix it with four screws.

6. Place the new fan on the fan bracket, and fix it with four screws.

7. Slide the fan bracket back to the chassis and fasten the thumb screw.

8. Plug in the fan power connector.

3.2.2 Replacing the 60 mm fan behind the SATA drive bay

1. Remove the two screws, which mount the FDD bracket to the drive bay unit.

2. Remove the four screws, which mount the drive bay unit to the chassis, then take out the drive bay unit.

3. Un-plug the fan power connector.

4. Remove the four screws, which mount the failed fan to the fan bracket, and take out the fan.

6. Place a new fan on the fan bracket, and fix it with four screws.

7. Plug in the fan power connector.

8. Return the drive bay unit into the ACP-4320 chassis and fix it with four screws.

9. Return the FDD bracket and fix it with the four screws.

3.3 Cleaning the filters

There are two filters in the ACP-4320: one in front of the fan and the other on the front door. To clean the filters, locate at the front end of the chassis, and proceed as follows:
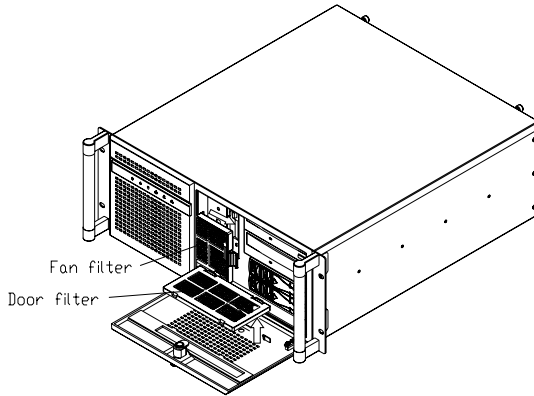
Figure 3.4: Removing the filters

3.3.1 Cleaning the filter on the front door

1. Open the front door.

2. Use two fore fingers to click on the two latches, which are located at the lower edge of filter, and gently lift out the filter.

3. Wash the dusts away from the filter with ample water.

4. Dry the filter.

5. Return the filter to the front door.

3.3.2 Replacing the filter in front of the 120 mm fan

1. Open the front door.

2. Pinch the fan filter holder with two fingers and slide it out from the chassis.

3. Wash the dusts away from the filter with ample water.

4. Dry the filter.

5. Return the fan filter to the chassis.

3.4 Replacing the power supply

The ACP-4320 supports both 300W/400W single PS/2 and 300W/400W redundant power supplies. To change a failed power supply, please proceed as follows:

3.4.1 Replacing the single PS/2 power supply

Figure 3.5: Changing the single PS/2 power supply

1. Un-plug the power cord from the power supply.

2. Remove the upper cover of the ACP-4320 chassis.

3. Remove the two screws, which mount the hold-down clamp to the ACP-4320 chassis, and take out the hold-down clamp.

4. Unplug the 20-/24-pin ATX power connector and +12V power connector from the CPU card/motherboard, the floppy drive power connector from the floppy drive disk, and the peripheral power connector(s) from the CD-ROMs, the hard drive disk(s), and the two-bay SATA HDD backplane.

5. Remove the six screws which mount the failed power supply to the ACP-4320 chassis, then take out the power supply.

6. Place a new power supply into the chassis and fix it with the six

screws.

7. Plug the ATX power connector and +12V power connector to the CPU card/motherboard, as well as the floppy drive power connector and the peripheral power connector(s) to the proper disk drives.

8. Replace the hold down clamp and fix it with the two screws.

9. Replace the upper cover of ACP-4320 and plug in the power cord.

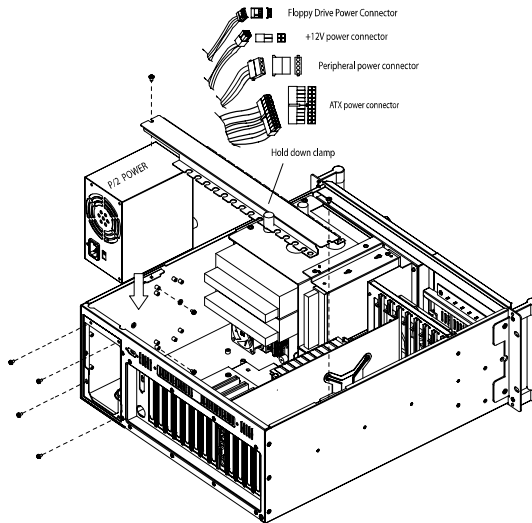## 3.4.2 Replacing the redundant power supply
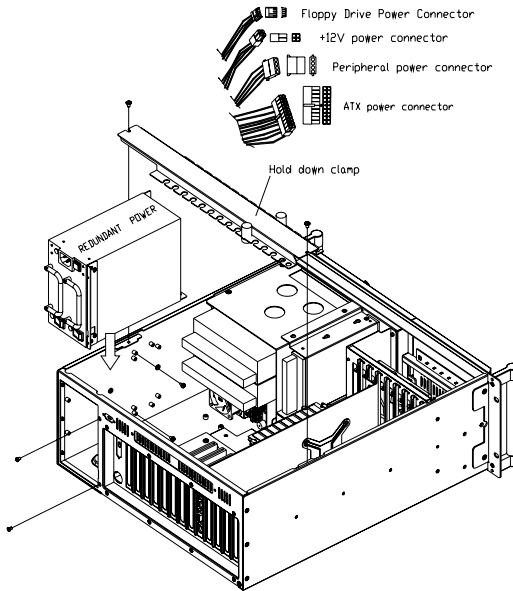
Figure 3.6: Changing the redundant power supply

1. Un-plug the power cord from the redundant power supply.

2. Remove the upper cover of the ACP-4320 chassis.

3. Remove the two screws, which mount the hold-down clamp to the ACP-4320 chassis, and take out the hold-down clamp.

4. Unplug the 20-/24-pin ATX power connector and +12V power connector from the CPU card/motherboard, the floppy drive power connector from the floppy drive disk, and the peripheral power

connector(s) from the CD-ROMs, the hard drive disk(s), and the two-bay SATA HDD backplane.

5. Remove the four screws which mount the failed redundant power supply to the ACP-4320 chassis, then take out the power supply.

6. Place a new redundant power supply into the chassis and fix it with the four screws.

7. Plug the ATX power connector and +12V power connector to the CPU card/motherboard, as well as the floppy drive power connector and the peripheral power connector(s) to the proper disk drives.

8. Replace the hold down clamp and fix it with the two screws.

9. Replace the upper cover of ACP-4320 and plug in the power cord.

Alarm Board

The alarm board is located behind the front panel of ACP-4320 chassis and below the system fan. The alarm board makes an audible alarm when:

• Any power supply module of the redundant power supply fails

• One of the cooling fans fai1s

• Internal temperature of the chassis is too high

To stop the alarm beep, simply press the Alarm Reset button on the front panel.

4.1   Alarm board layout

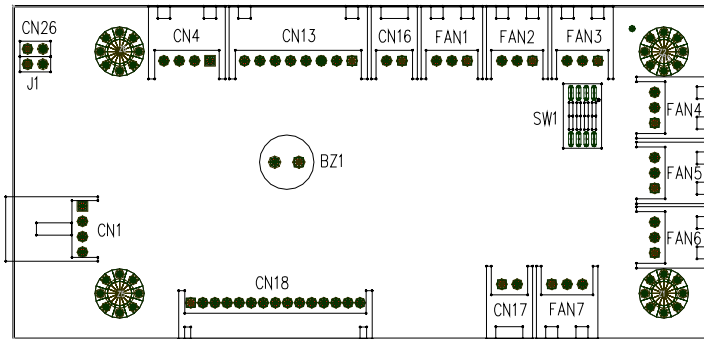The layout and detailed specifications of the alarm board are given below:

Figure 4.1: Alarm board layout

4.2 Alarm board specifications

Input Power: +5V, +12V

Input Signals:

- 7 fan connectors
- One thermal board connector (connects up to 8 thermal sensors in series)
- One Power Good connector
- One alarm reset connector
- One voltage signal connector (connect from back plane, includes 12V, 5V, 3.3V)
- One HDD LED connector (connect from the CPU card/motherboard)

Output Signals:

- One LED board connector
- One LCM board connector
- One Buzzer output

Pin Definition:

Table 4.1: Summary of the connectors on the alarm board			
CN1: External power connector, standard mini 4-pin power connector			
Pin 1	+12V @ 2A max.	**Pin 2**	GND
Pin 3	GND	**Pin 4**	+5V @ 2A max
CN4: Thermal sensor (LM75) connector			
Pin 1	+5V	**Pin 2**	T_SCLK
Pin 3	T_SDAT	**Pin 4**	GND
CN13: Voltage detect input connector			
Pin 1	5VSB	**Pin 2**	GND
Pin 3	GND	**Pin 4**	-5V
Pin 5	+5V	**Pin 6**	+3.3V
Pin 7	-12V	**Pin 8**	+12V

Table 4.1: Summary of the connectors on the alarm board

CN16: Power Good input

Pin 1	Power Good A	Pin 2	GND

CN17: Alarm Reset connector

Pin 1	Alarm reset	Pin 2	GND

CN18: LED Board connector

Pin 1	GND	Pin 2	+5V Signal
Pin 3	+12V Signal	Pin 4	-5V Signal
Pin 5	-12V Signal	Pin 6	HDD Signal
Pin 7	Power Good Signal	Pin 8	Power Fail Signal
Pin 9	Temperature Good Signal	Pin 10	Temperature Fail Signal
Pin 11	FAN Good Signal	Pin 12	FAN Fail Signal
Pin 13	N/A	Pin 14	+3.3V Signal
Pin 15	+5VSB Signal		

CN26: External HDD LED connector

Pin 1	HLED_ACT	Pin 2	N/A

J1: External speaker

Pin 1	Buzzer	Pin 2	+5V

SW1: Fan number select switch

Pin 1	GND	Pin 2	FAN_SEL1
Pin 3	GND	Pin 4	FAN_SEL2
Pin 5	GND	Pin 6	FAN_SEL3
Pin 7	GND	Pin 8	Reset

4.3 Switch settings

4.3.1 Fan number setting

Table 4.2: Fan number setting				
Fan Number	**SW 1-1**	**SW 1- 2**	**SW 1- 3**	**SW 1- 4**
0	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF

4.4 Thermal sensor

There is a thermal sensor mounted on the right-wall plate, close to the rear side of the chassis. The thermal sensor monitors the in-chassis temperature. When the side temperature is overheated, the thermal sensor sends a signal to the alarm board and a continuous alarm will be activated. To stop the alarm beep, press the Alarm Reset button on the front panel. Figure 4-2 shows the layout of the thermal sensor module. Users can refer to *Section 4.4.1 Thermal sensor number setting* (see next page) to adjust the switch.
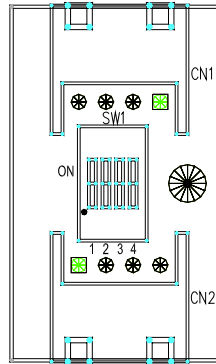

Figure 4.2:   Thermal sensor module layout

4.4.1 Thermal sensor number setting

Table 4.3: Thermal sensor number setting				
TEMP INDEX	**SW 1 -1**	**SW 1 - 2**	**SW 1 - 3**	**SW 1 - 4**
TEMP 1	OFF	OFF	OFF	ON
TEMP 2	OFF	OFF	ON	ON
TEMP 3	OFF	ON	OFF	ON
TEMP 4	OFF	ON	ON	ON
TEMP 5	ON	OFF	OFF	ON
TEMP 6	ON	OFF	ON	ON
TEMP 7	ON	ON	OFF	ON
TEMP 8	ON	ON	ON	ON

Exploded Diagram

Appendix A   Exploded Diagram
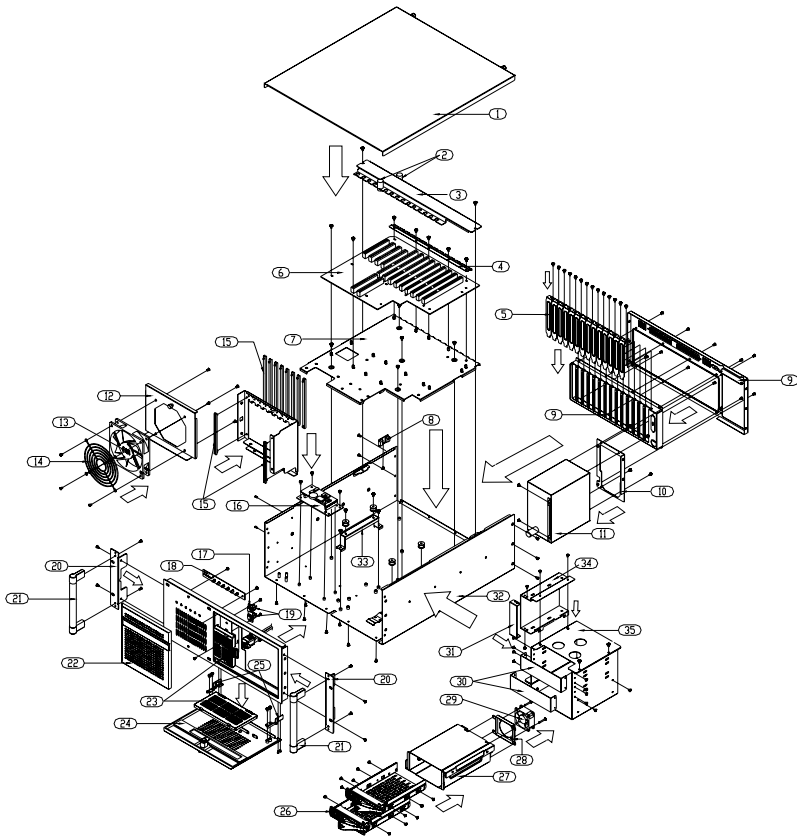
① Top Cover	⑪ Power Supply	㉑ Handles	㉛ 3.5" Drive Bay Cover
② Clamp Pad	⑫ 120mm Fan Bracket	㉒ Left Body	㉜ Body Of Chassis
③ Hold Down Clamp	⑬ 120mm Fan Set	㉓ Filter Cover	㉝ Drive Mounting Bracket
④ EMI Spring Plate	⑭ 120mm Fan Guard	㉔ Front Door	㉞ 3.5" Drive Bay Bracket
⑤ Adapter Bracket	⑮ Card Guide Rails	㉕ Hinges	㉟ Drive Bay Unit
⑥ Backplane	⑯ Alarm Board	㉖ Mobile HDD Tray Units	
⑦ Underplate	⑰ Switch Bracket	㉗ Mobile HDD Cage	
⑧ Thermal Sensor	⑱ LED Board	㉘ 60mm Fan Bracket	
⑨ Backplane Rear Window	⑲ Switches	㉙ 60mm Fan Set	
⑩ Power Supply Bracket	⑳ Rackmount Ear	㉚ 5.25" Drive Bay Cover	

Figure A.1: Exploded diagram

Safety Instructions

Appendix B   Safety Instructions

B.1 English

1. Read these safety instructions carefully.

2. Keep this installation reference guide for later reference.

3. Disconnect this equipment from any AC outlet before cleaning. Do not use liquid or spray detergents for cleaning. Use a damp cloth.

4. For pluggable equipment, the power outlet must be installed 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 could 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 over-voltage.

12. Never pour any liquid into an opening. This could 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 any of the following situations arises, get the equipment checked by service personnel:

    a. The power cord or plug is damaged.

    b. Liquid has penetrated into the equipment.

    c. The equipment has been exposed to moisture.

    d. The equipment does not work well, or you cannot get it to work according to the installation reference guide.

    e. The equipment has been dropped and damaged.

    f. The equipment has obvious signs of breakage.

15. DO NOT LEAVE THIS EQUIPMENT IN AN UNCONTROLLED ENVIRONMENT WHERE THE STORAGE TEMPERATURE IS BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS MAY DAMAGE THE EQUIPMENT.

The sound pressure level at the operator's position according to IEC 704-1:1982 is equal to or less 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.

B.2 German - Wichtige Sicherheishinweise

1. Bitte lesen sie Sich diese Hinweise sorgfältig durch.

2. Heben Sie diese Anleitung für den späteren Gebrauch auf.

3. Vor jedem Reinigen ist das Gerät vom Stromnetz zu trennen. Verwenden Sie Keine Flüssig-oder Aerosolreiniger. Am besten dient ein angefeuchtetes Tuch zur Reinigung.

4. Die Netzanschlußsteckdose soll nahe dem Gerät angebracht und leicht zugänglich sein.

5. Das Gerät ist vor Feuchtigkeit zu schützen.

6. Bei der Aufstellung des Gerätes ist auf sicheren Stand zu achten. Ein Kippen oder Fallen könnte Verletzungen hervorrufen.

7. Die Belüftungsöffnungen dienen zur Luftzirkulation die das Gerät vor überhitzung schützt. Sorgen Sie dafür, daß diese Öffnungen nicht abgedeckt werden.

8. Beachten Sie beim Anschluß an das Stromnetz die Anschlußwerte.

9. Verlegen Sie die Netzanschlußleitung so, daß niemand darüber fallen kann. Es sollte auch nichts auf der Leitung abgestellt werden.

10. Alle Hinweise und Warnungen die sich am Geräten befinden sind zu beachten.

11. Wird das Gerät über einen längeren Zeitraum nicht benutzt, sollten Sie es vom Stromnetz trennen. Somit wird im Falle einer Überspannung eine Beschädigung vermieden.

12. Durch die Lüftungsöffnungen dürfen niemals Gegenstände oder Flüssigkeiten in das Gerät gelangen. Dies könnte einen Brand bzw elektrischen Schlag auslösen.

13. Öffnen Sie niemals das Gerät. Das Gerät darf aus Gründen der elektrischen Sicherheit nur von authorisiertem Servicepersonal geöffnet werden.

14. Wenn folgende Situationen auftreten ist das Gerät vom Stromnetz zu trennen und von einer qualifizierten Servicestelle zu überprüfen:

15. Netzkabel oder Netzstecker sind beschädigt.

16. Flüssigkeit ist in das Gerät eingedrungen.

17. Das Gerät war Feuchtigkeit ausgesetzt.

18. Wenn das Gerät nicht der Bedienungsanleitung entsprechend funktioniert oder Sie mit Hilfe dieser Anleitung keine Verbesserung erzielen.

19. Das Gerät ist gefallen und/oder das Gehäuse ist beschädigt.

20. Wenn das Gerät deutliche Anzeichen eines Defektes aufweist.

21. Bitte lassen Sie das Gerät nicht unbehehrt hinten unter -20° C (-4° F) oder oben 60° C (140° F), weil diesen Temperaturen das Gerät zerstören könten.

Der arbeitsplatzbezogene Schalldruckpegel nach DIN 45 635 Teil 1000 beträgt 70dB(A) oder weiger.

DISCLAIMER: This set of instructions is provided according to IEC704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.