

**IPC-6908**

Industrial PC Chassis

**User's Manual**

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## Acknowledgments

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# Chapter 1 General Information

## 1.1 Introduction

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The IPC-6908 is a high-end PC/AT-compatible desktop/wallmount fault-resilient IPC chassis designed for high-reliability applications. It can be easily installed and maintained in harsh environments and mission critical applications. The IPC-6908 includes an 8-slot PC-bus compatible passive backplane. It also includes a 260-watt switching power supply with an ultrahigh output rating at -12 V, as well as a hot-swappable fan cooling system. The IPC-6908 accepts up to 4 disk drives: one 3.5" front accessible drive, two half-height drives, and one 3.5" drive inside.

The IPC-6908 features an advanced fault detection and alarm notification system to monitor its own hardware status. If a PC system shuts down without any prior warning, it can cause considerable loss. The IPC-6908, a premier fault-resilient IPC, is designed to prevent this from happening.

## 1.2 Specifications

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### General

- **Construction:** Heavy-duty steel chassis and fireproof plastic front panel
- **Slots:** Up to 8 full-length cards can be installed in a single chassis
- **Disk drive capacity:** Two front-accessible half-height and one 3.5" disk drives, and one 3.5" drive inside the chassis
- **Cooling system:** Two 49 CFM cooling fans (flow-in) at front, with an air filter. Dual fans for redundancy and hot-swappability
- **Controls:** Power on/off switch in rear panel; CPU reset and alarm reset buttons in front panel
- **Indicators:** HDD activity; and bicolor LEDs (green and red) for power on/off, Fan 1/2 failure and overheating
- **Speaker:** One 8 ohm / 0.3 watt speaker, volume control on board
- **Dimensions (W x D x H):** 200 x 300 x 463 mm (7.9" x 11.8" x 18.2")
- **Weight:** 12 kg (26.4 lb)
- **Paint color:** Pantone 415 (plastic front panel), Pantone 418U (metal chassis)

### Passive backplanes

#### PCA-6108E

- **Slots:** 8 ISA-bus, full-size slots
- **PC board:** 4-layer PCB with ground and power planes for reduced noise and lower power supply impedance
- **Indicators:** LEDs for +5 V, -5 V, +12 V and -12 V

### PCA-6108P4

- **Slots:** 3 ISA / 4 PCI / 1 PICMG slots
- **PC board:** 4-layer PCB with ground and power planes for reduced noise and lower power supply impedance
- **Indicators:** LEDs for +5 V, -5 V, +12 V, -12 V and +3.3 V

### PCA-6108P6

- **Slots:** 1 ISA / 6 PCI / 1 PICMG slots
- **PC board:** 4-layer PCB with ground and power planes for reduced noise and lower power supply impedance
- **Indicators:** LEDs for +5 V, -5 V, +12 V, -12 V and +3.3 V

## Power supplies

### PS-260

- **Output rating:** 260 watts (max.)
- **Input voltage:** 85 ~ 130 V<sub>AC</sub> or 180 ~ 260 V<sub>AC</sub> @ 47 ~ 63 Hz, switchable
- **Output voltages:** +5 V @ 25 A, +12 V @ 9 A, -5 V @ 0.5 A, -12 V @ 2 A
- **Minimum load:** +5 V @ 1 A, +12 V @ 0.1 A
- **MTBF:** 140,000 hours @ 50° C
- **Safety:** UL/CSA/TUV approved
- **EMI:** Meets FCC/VDE Class B

### RPS-250

- **Output rating:** 230 watts (max.) up to 30° C operating temperature  
200 watts (max.) up to 40° C operating temperature
- **Input voltage:** 90 ~ 130 V<sub>AC</sub> or 180 ~ 264 V<sub>AC</sub> @ 47 ~ 63 Hz, switchable
- **Output voltages:** +5 V @ 25 A, +12 V @ 12 A, -5 V @ 1 A, -12 V @ 1 A
- **Minimum load:** +5 V @ 4 A, +12 V @ 1 A
- **MTBF:** 250,000 hours @ 30° C

### PS-310DC48

- **Output rating:** 300 watts (max.)
- **Input voltage:** -38 V<sub>DC</sub> ~ -58 V<sub>DC</sub>
- **Output voltages:** +5 V @ 25 A, +12 V @ 10 A, -5 V @ 1.0 A, -12 V @ 5 A
- **Minimum load:** +5 V @ 1 A, +12 V @ ?? A
- **MTBF:** 200,000 hours at 25° C
- **Safety:** UL approved
- **EMI:** Meets FCC/VDE Class B

## Installation notes

The IPC-6908 is designed to permit the connection of the earthed conductor of the DC supply circuit to the earthing conductor of the IPC-6908's chassis.

If this connection is made, make sure that:

1. The IPC-6908 is connected directly to the DC supply system earthing electrode conductor, or to a bonding jumper from an earthing terminal bar or bus to which the DC supply system earthing electrode conductor is connected.
2. The IPC-6908 is located not only in the same immediate area (such as adjacent cabinets) as any other equipment that has a connection between the earthed conductor of the same DC supply circuit and the earthing conductor, but also in the same immediate area as the point of earthing of the DC system. The DC system must not be earthed elsewhere.
3. The DC supply source is located within the same premises as the IPC-6908.
4. No switching or disconnecting device is installed in the earthed circuit conductor between the DC source and the point of connection of the earthing electrode conductor.

*Warning: Due to the high wattage of the IPC-6908, users must not remove the top cover of the chassis. If users need to install or remove any device in the IPC-6908, they should consult qualified technical personnel.*

## Environmental specifications

- **Operating temperature:** 0 ~ 50° C (32 ~122° F)
- **Relative humidity:** 10 ~ 95% @ 40° C, non-condensing
- **Safety:** UL / C-UL approved
- **EMI:** Meets FCC/VDE Class A
- **CE compliant**

## Fault detection and alarm notification

- **Fan failure:** If either of the two cooling fans fails, the dedicated LED (Fan 1 or Fan 2) changes color from green to red, and an audio alarm sounds. The dedicated LED remains red for the failed fan unit until it is fixed

The fan assembly can be hot-swapped if either fan fails. Dual fans provide redundant application

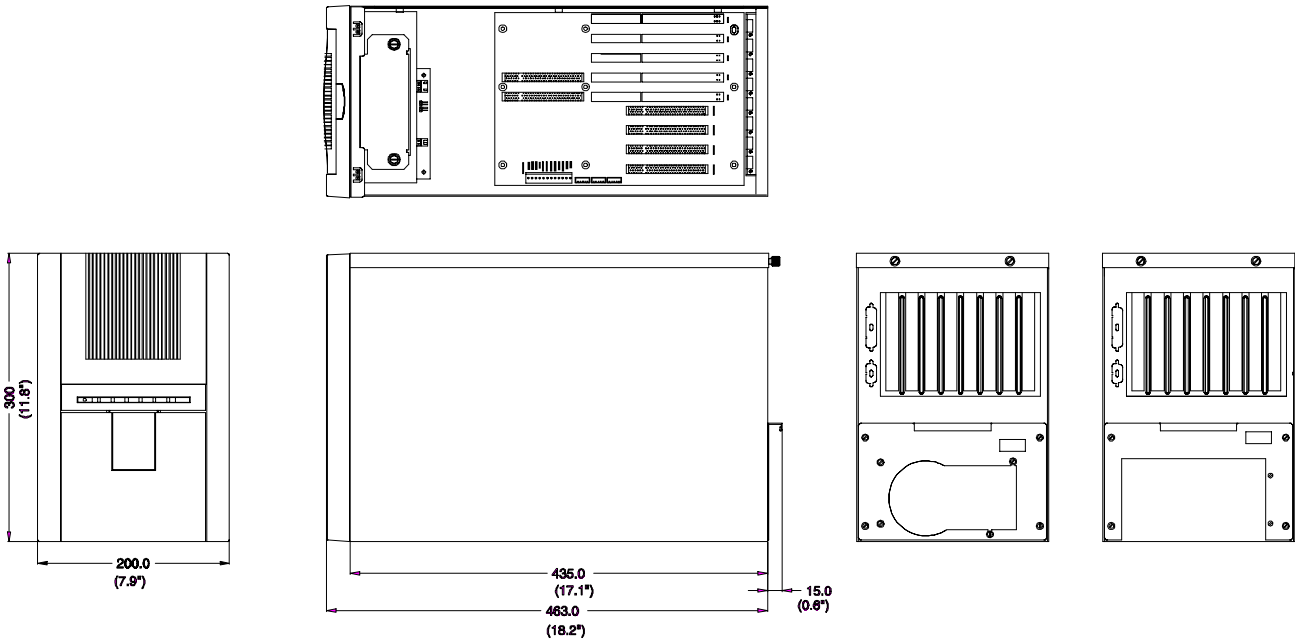
- **Excess temperature:** If the chassis' interior temperature exceeds 65° C (149° F) (standard setting), the LED changes color from green to red and an audio alarm sounds. The LED remains red until the temperature falls below 63° C

Threshold temperature select: The threshold temperature can be set to any of four levels by adjusting the switch on the alarm board:

65° C (default setting), 55° C , 70° C, or 75° C

- **Audible alarm:** A speaker is activated (continuous beep) as soon as a malfunction is detected. It sounds until the alarm reset button is pressed. The alarm reset button is on the front panel. However, the alarm indicator will stay red until the fault condition is rectified
- **Self-test:** Press the Alarm Reset button for 8 seconds. The alarm board will self-test automatically for all functions. The alarm board can also monitor the temperature sensor IC. If the sensor has failed or there is no connection, the speaker will emit a "beep... beep ..." warning.

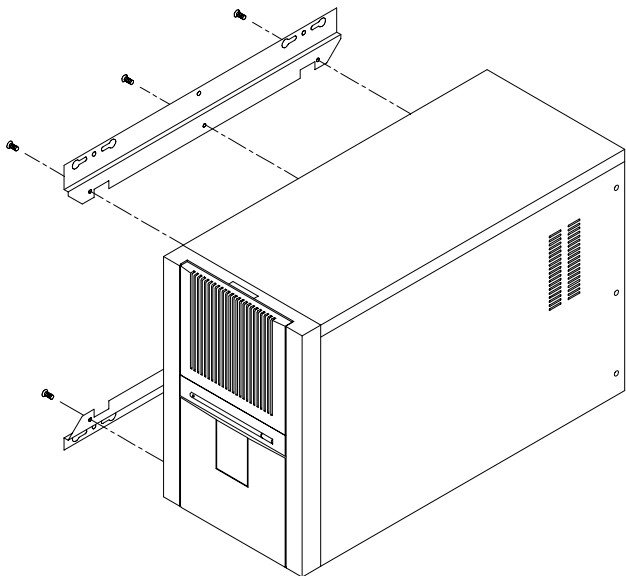
# 1.3 Dimensions



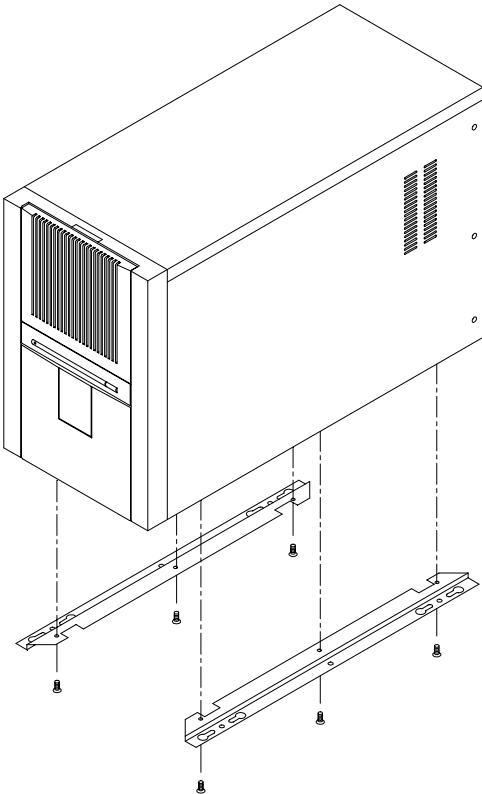
Unit: mm

# 1.4 Installation

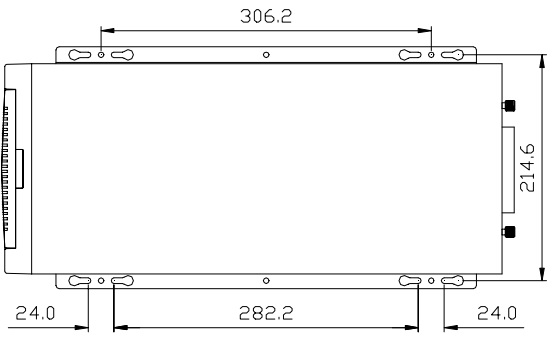
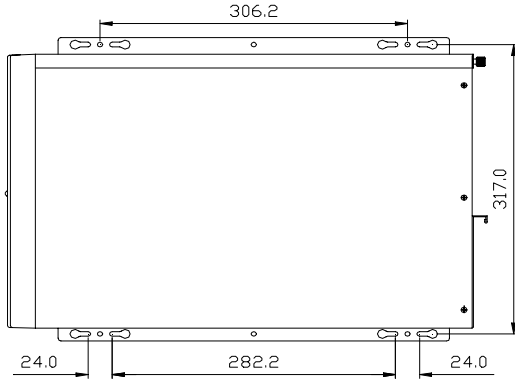
Wall mounting



Desktop mounting



Unit: mm





## Chapter 2 System Setup

Setting up your IPC-6908 requires only a screwdriver and a small amount of time. Before you begin, you should also gather together all of the cards you plan to install, as well as the disk drives you plan to use.

The doors are located on the chassis front cover, providing access to the control panel. This design offers the disk drive and air filter protection against damage, and allows for easy accessibility. The control panel functions include a CPU reset switch and alarm reset switch at the front, a power on/off switch at the back, and five LED indicators to assist in monitoring system status. On the rear panel, there is a ground point (earthing point) located in the bottom right hand corner. This provides a ground for the whole system and is attached with a screw.

**WARNING:**

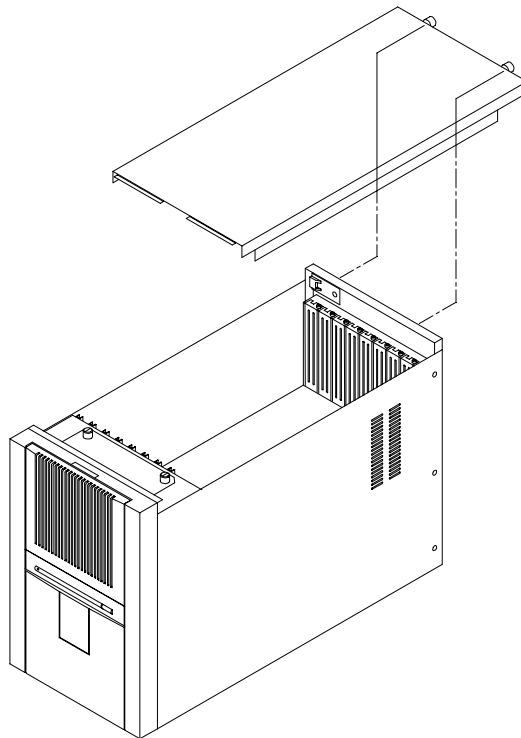


***Disconnect all power from the chassis before you install the CPU cards. Unplug the power cord from the wall, do not just turn off the power switch. If you are not sure what to do, take the job to an experienced professional.***

### 2.1 Removing the cover

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Unscrew the two thumbscrews on the rear, and then slide the cover toward the rear chassis. See Figure 2-1 below:



**Figure 2-4: Removing the cover**

## 2.2 Installing plug-in cards

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After removing the cover, you can easily install plug-in cards. See Figure 2-2 below:

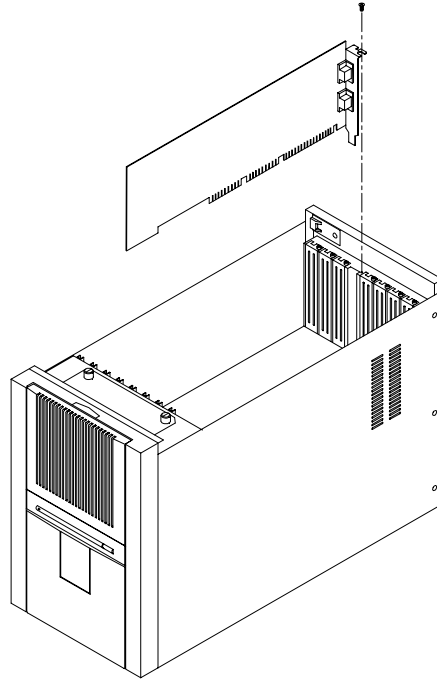


Figure 2-2: Installing plug-in cards

## 2.3 The hold-down clamp

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The IPC-6908 uses a hold-down clamp to ensure that the plug-in cards are located securely. It also offers protection against shock and vibration. The hold-down clamp is built-in on the upper cover. Insert the rubber buffers provided with your kit into the hold-down clamp. These buffers offer the plug-in cards two levels of protection against vibration.

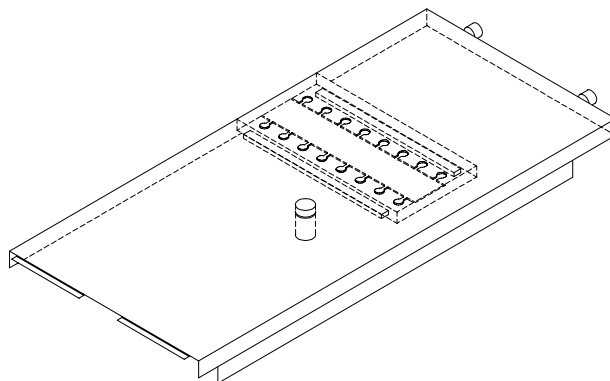


Figure 2-3: Inserting the rubber buffers

## 2.4 Replacing the filter

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The filter is located on the front upper door. Under continuous use, the filter should be replaced about once a month. To replace the filter, refer to Figure 2-4 below and do the following:

1. Open the door by pressing the latch on the top of the door.
2. Remove the filter and replace it with a new filter.
3. Close the door.

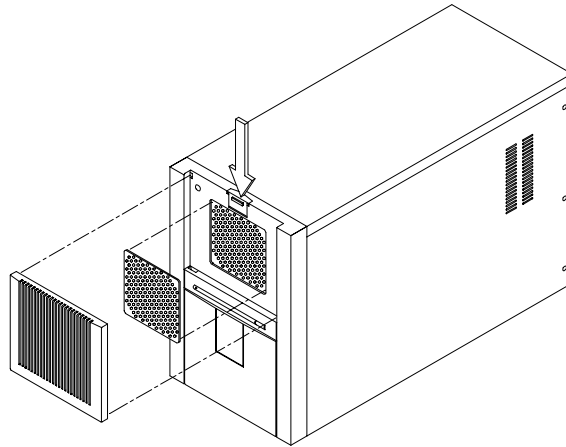


Figure 2-4: Replacing the filter

## 2.5 Installing the fan assembly

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Remove the cover and slide it toward the rear side. The fan assembly can be hot-swapped, so there is no need to turn off the power. Remove/insert the fan by using your fingers to unscrew the screw fasteners on the top of the fan assembly. Refer to Figure 2-5 below:

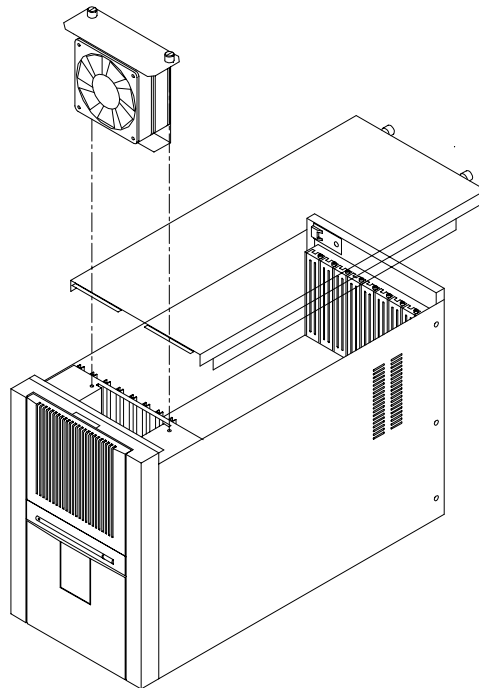


Figure 2-5: Hot-swappable fan assembly

## 2.6 Installing the disk drives

1. Remove the disk drive's cover by pushing the square area on the lower cover of the front panel and then opening the filter cover, as shown in Figure 2-6 below.
2. Unscrew the 4 screws on the front panel, and take off the plastic panel from the chassis. Unscrew the 3 screws on the side cover and slide it toward the rear. Refer to Figure 2-6 below.
3. Punch out the disk cover of the plastic cover with your fingers. See Figure 2-7 below.

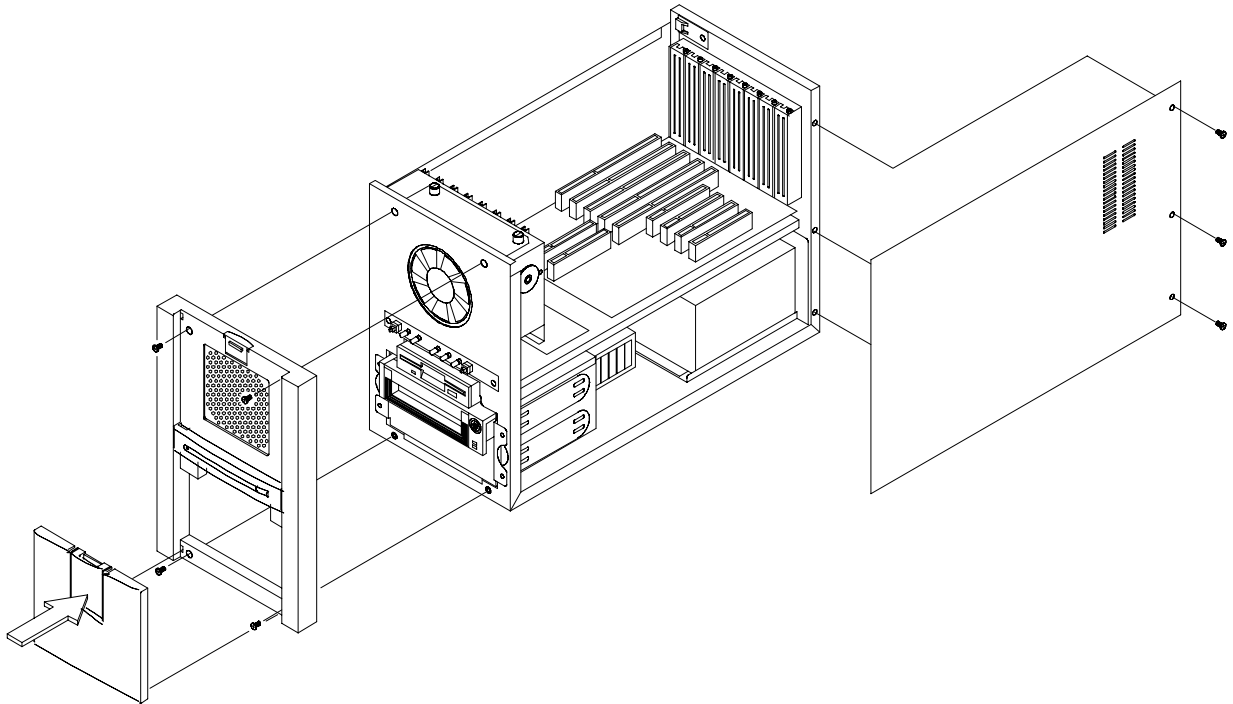


Figure 2-6: Removing the cover for disk drive installation

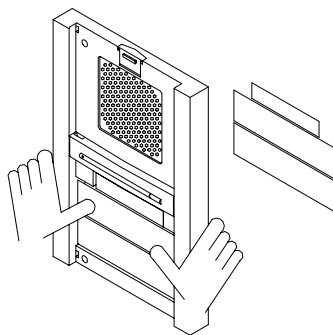
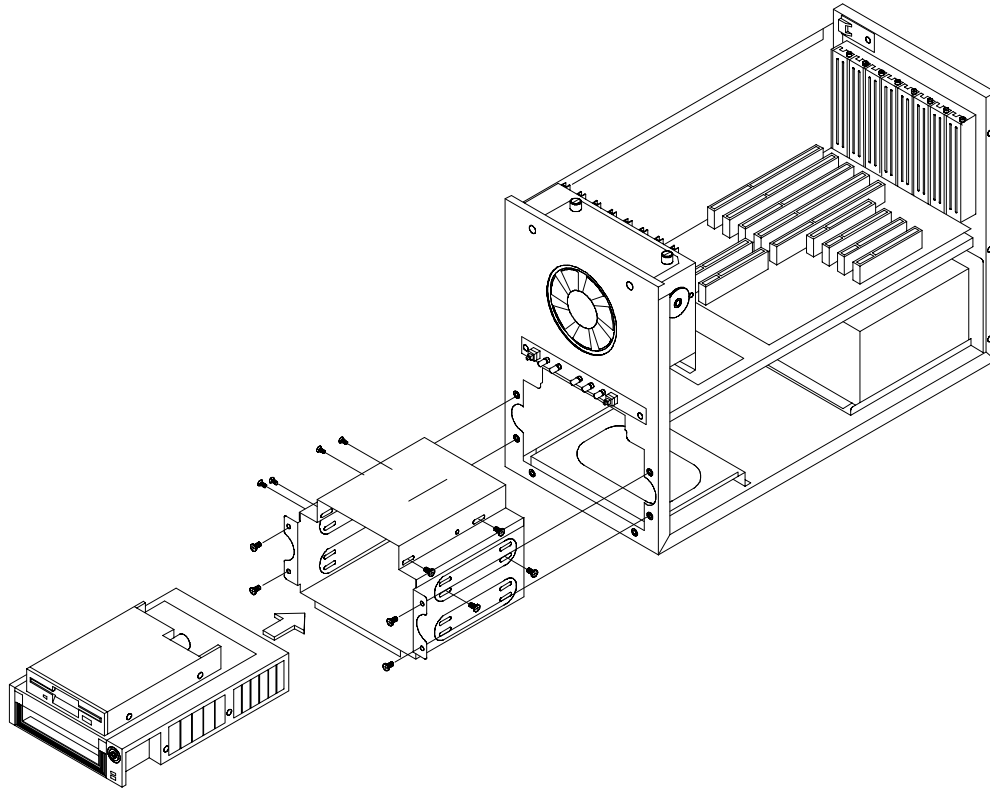


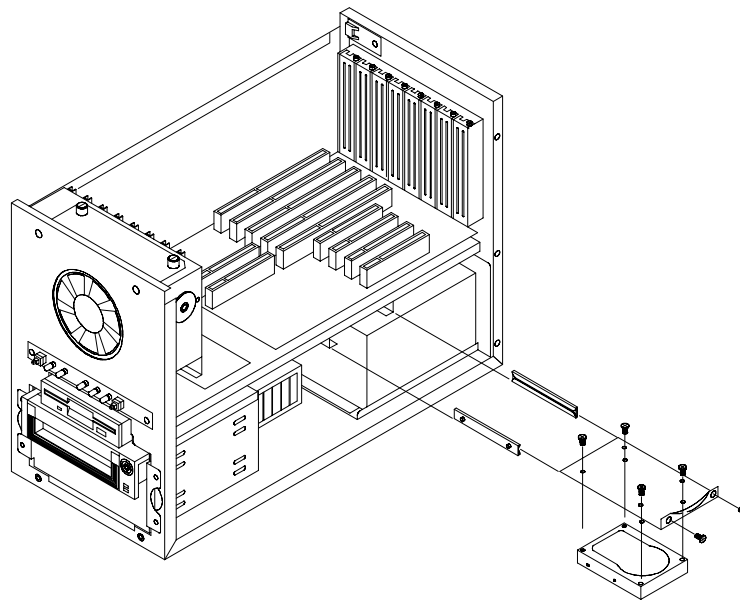
Figure 2-7: Punching out the disk cover

- Slide the drive bay toward the front and lift it free from the chassis. Install the disk drives into their proper locations in the drive bay. See Figure 2-8:



**Figure 2-8: Inserting the drives into the drive bay**

- One 3.5" drive can be installed inside the chassis. Remove the HDD bracket from the HDD drawer. Attach the drive to the bracket by fastening the four screws. You can then insert the drive above the power module. See Figure 2-9:



**Figure 2-9: Inserting the drives into the drive bay inside the chassis**

## 2.7 Adjusting speaker volume

There is a VR (R7) for speaker volume adjustment located on the alarm board inside the chassis. Remove the top cover and use the screwdriver to adjust the volume as show in Figure 2-10 below:

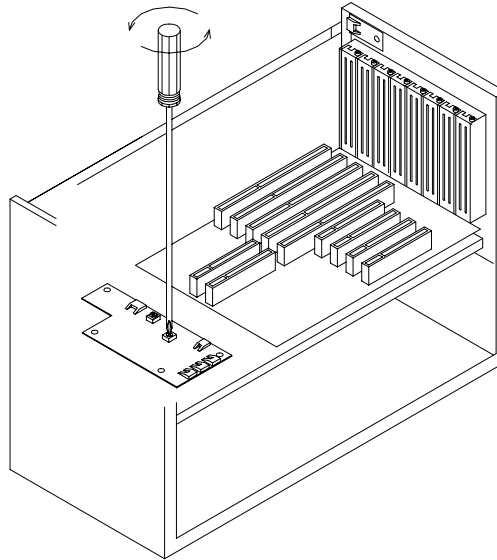


Figure 2-10: Volume adjustment

## 2.8 Temperature setting

If the chassis interior temperature exceeds 65° C (149° F) (default setting), the LED changes color from green to red and an audio alarm sounds. The LED remains red until the temperature falls below 63° C.

The alarm threshold temperature can be selected (via S1) on the alarm board inside the chassis:

*Note:* When installing a redundant power supply, the "Power Good" connector of the power supply must be connected to JP2.

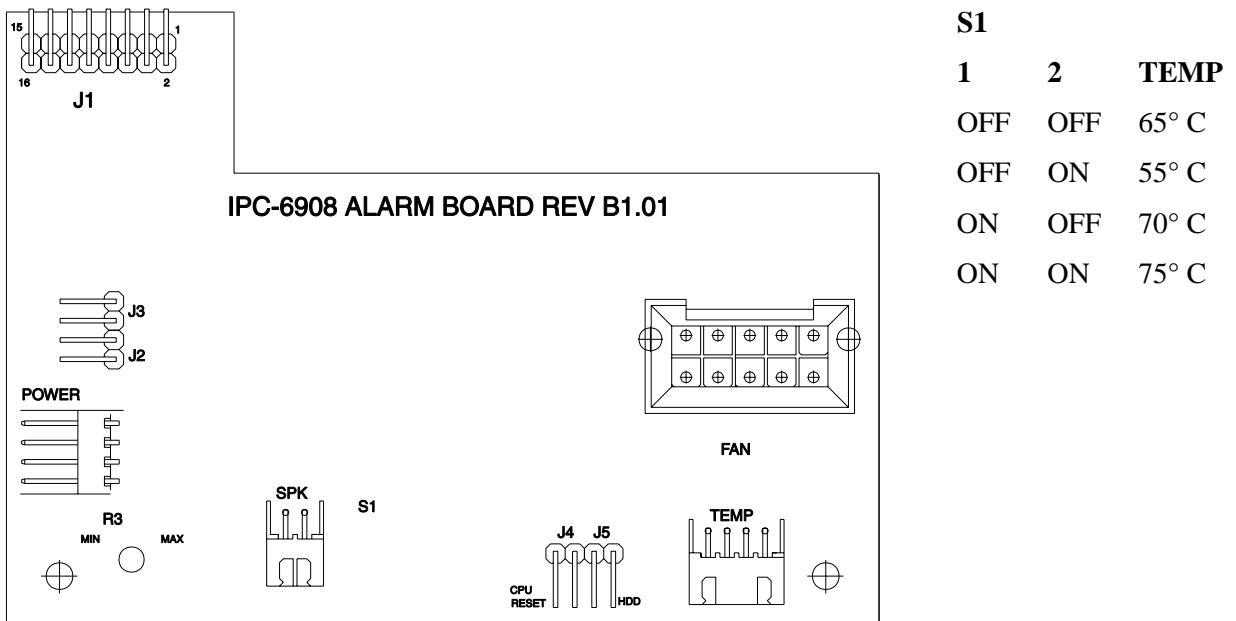
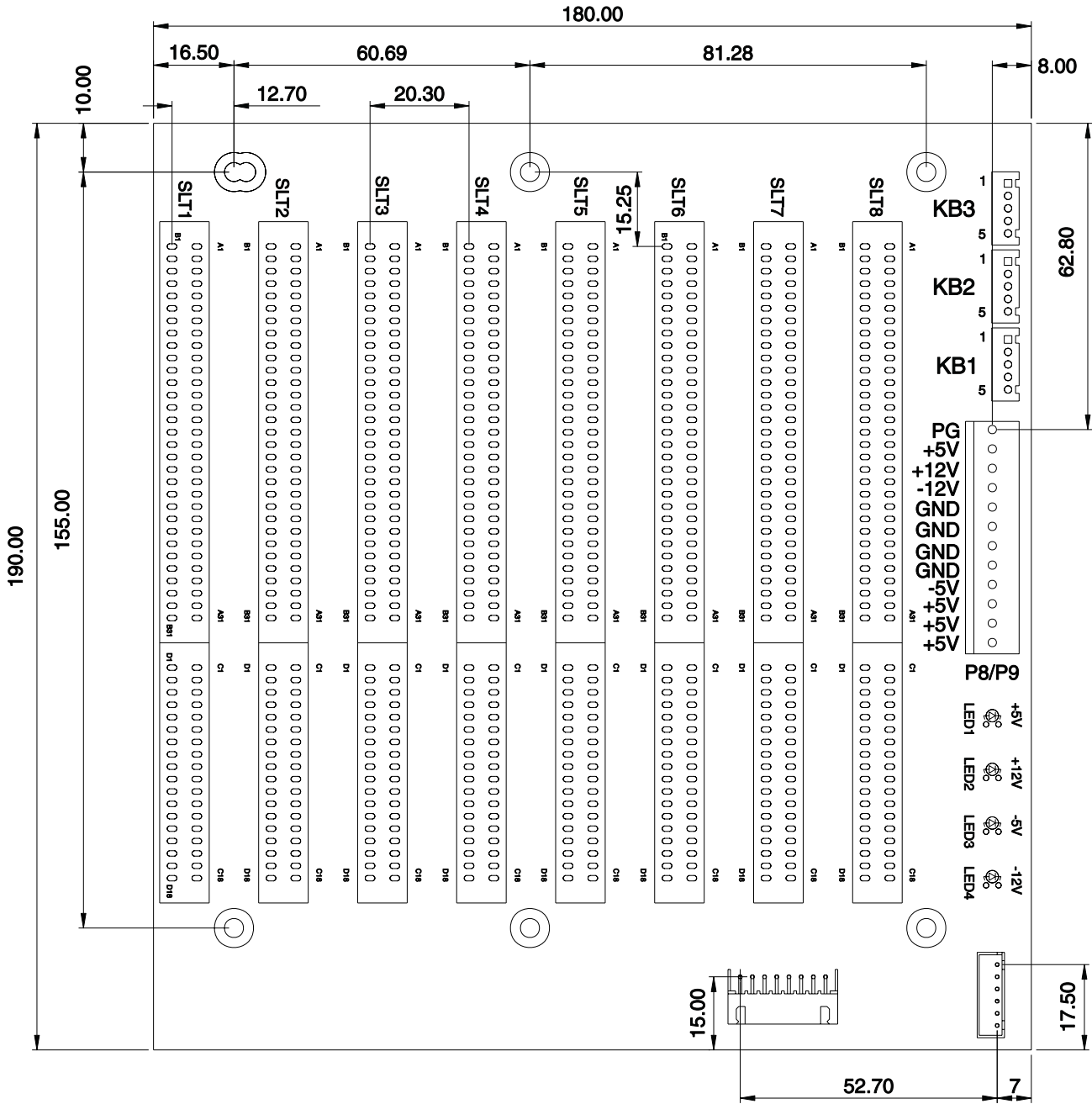


Figure 2-11: Alarm board

# Appendix A Passive Backplanes

## PCA-6108E: 8-slot ISA-bus backplane

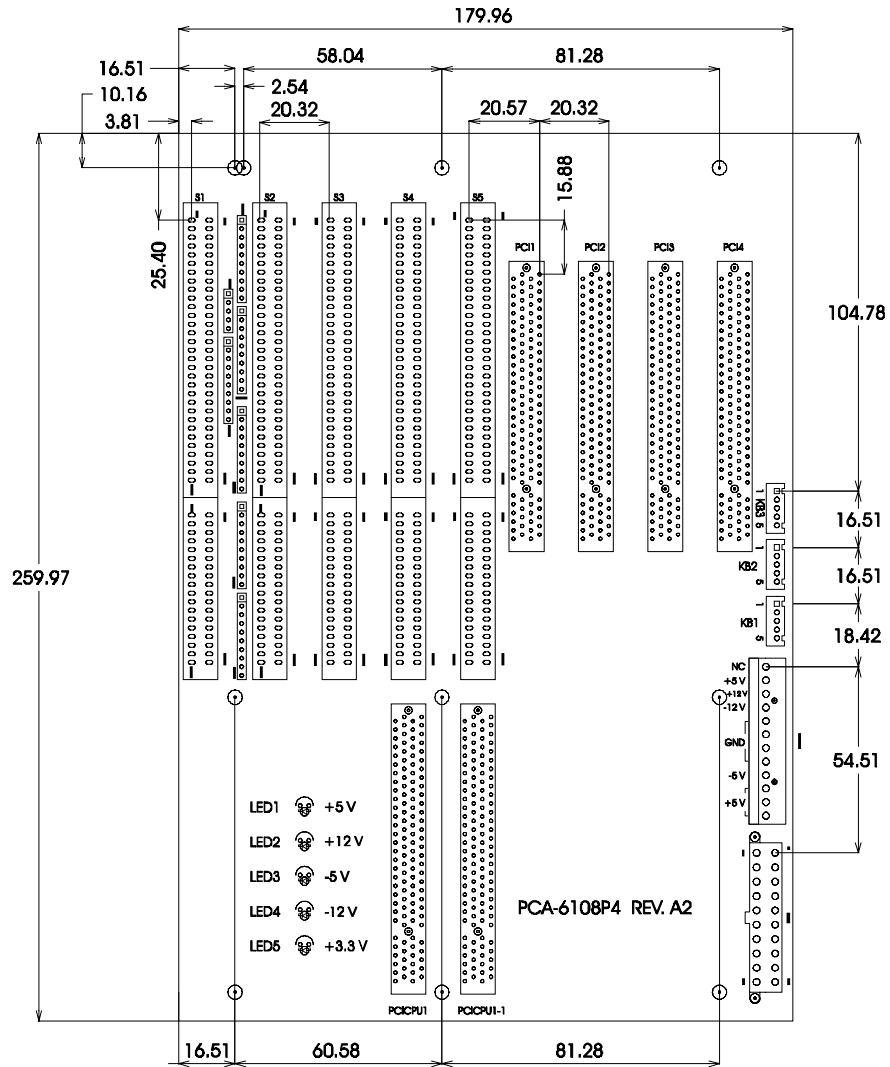
Dimensions: 180 x 190 mm



Unit: mm

# PCA-6108P4: 3 ISA / 4 PCI / 1 CPU-slot backplane

Dimensions: 180 x 260 mm



Unit: mm

## 1. CONNECTORS

| CONNECTOR | DESCRIPTION                          |
|-----------|--------------------------------------|
| SLT4 ~ 5  | PICMG connectors                     |
| SLT1 ~ 3  | 16-bit ISA-bus connector             |
| PCI1 ~ 4  | 32-bit PCI-bus connectors            |
| KB1 ~ 3   | Keyboard connector extension adapter |
| P8/P9     | To PS/2 power connector              |
| ATX       | ATX power connector                  |

## 2. PIN ASSIGNMENTS

| KB1 ~ 3 |        |
|---------|--------|
| PIN     | NAME   |
| 1       | KBDCLK |
| 2       | KBDATA |
| 3       | NC     |
| 4       | GND    |
| 5       | +5 V   |

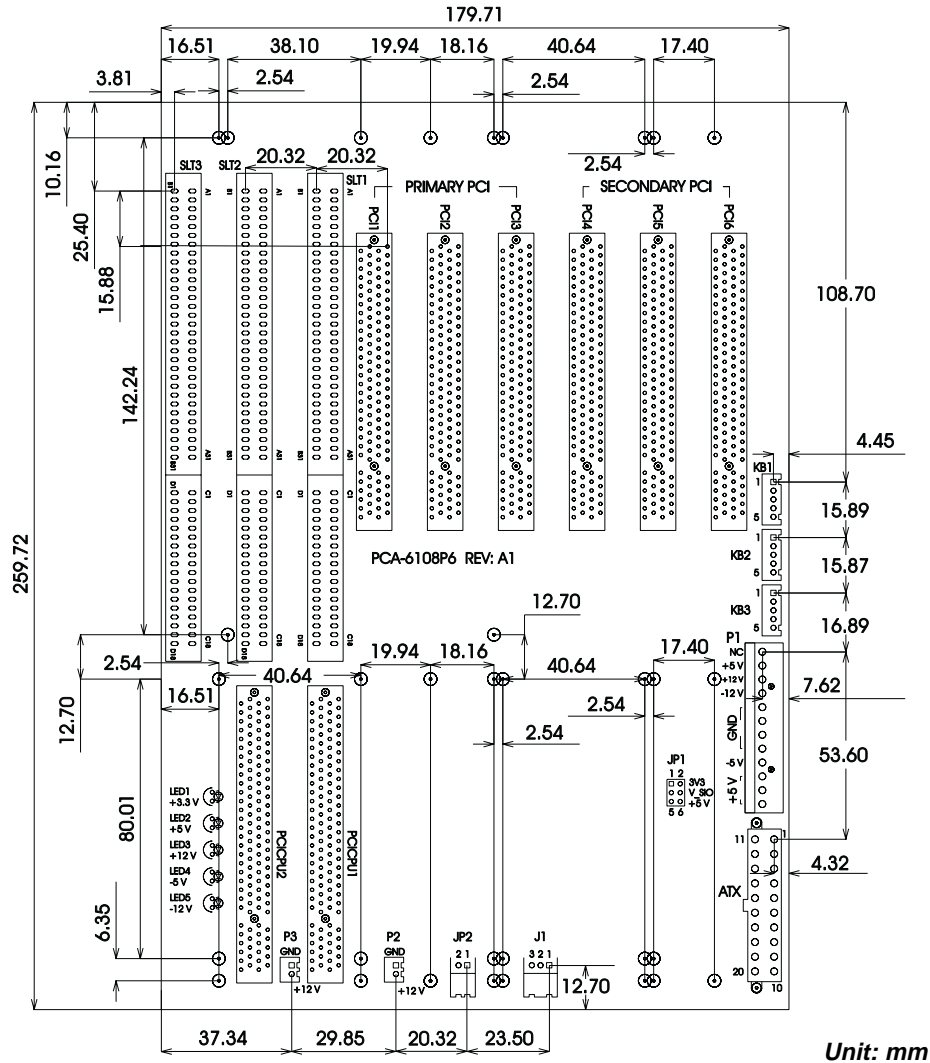
| P8/P9 |       |
|-------|-------|
| PIN   | NAME  |
| 1     | NC    |
| 2     | +5 V  |
| 3     | +12 V |
| 4     | -12 V |
| 5     | GND   |
| 6     | GND   |
| 7     | GND   |
| 8     | GND   |
| 9     | -5 V  |
| 10    | +5 V  |
| 11    | +5 V  |
| 12    | +5 V  |

| ATX |        |     |        |
|-----|--------|-----|--------|
| PIN | NAME   | PIN | NAME   |
| 1   | +3.3 V | 11  | +3.3 V |
| 2   | +3.3 V | 12  | -12 V  |
| 3   | GND    | 13  | GND    |
| 4   | +5 V   | 14  | PS-ON  |
| 5   | GND    | 15  | GND    |
| 6   | +5 V   | 16  | GND    |
| 7   | GND    | 17  | GND    |
| 8   | NC     | 18  | -5 V   |
| 9   | NC     | 19  | +5 V   |
| 10  | +12 V  | 20  | +5 V   |



# PCA-6108P6: 1 ISA / 6 PCI / 1 CPU-slot backplane

Dimensions: 180 x 260 mm



## 1. CONNECTORS

| CONNECTOR                        | DESCRIPTION                           |
|----------------------------------|---------------------------------------|
| SLT1 ~ 2                         | PICMG connectors                      |
| SLT3                             | 16-bit ISA-bus connector              |
| PCI1 ~ 3                         | 32-bit PCI-bus connectors (primary)   |
| PCI4 ~ 6                         | 32-bit PCI-bus connectors (secondary) |
| KB1 ~ 3                          | Keyboard connector extension adaptor  |
| P1                               | PS/2 power connector                  |
| ATX                              | ATX power connector                   |
| * P1, ATX use one connector only |                                       |
| J1                               | To CPU card for ATX power signal      |
| JP2                              | Power ON for ATX power supply         |
| P2, P3                           | For CPU fan and system fan            |
| JP1                              | V - IO for secondary PCI bus          |

| JP1             |  |
|-----------------|--|
| 1-3, 2-4 closed | V <sub>IO</sub> = +3.3 V for secondary PCI bus |
| 3-5, 4-6 closed | V <sub>IO</sub> = +5 V for secondary PCI bus   |

\* Default

## 2. PIN ASSIGNMENTS

| KB1 ~ 3 |         | P1  |       | ATX |         |     |        |
|---------|---------|-----|-------|-----|---------|-----|--------|
| PIN     | NAME    | PIN | NAME  | PIN | NAME    | PIN | NAME   |
| 1       | KBCLK   | 1   | NC    | 1   | +3.3 V  | 11  | +3.3 V |
| 2       | KBDDATA | 2   | +5 V  | 2   | +3.3 V  | 12  | -12 V  |
| 3       | NC      | 3   | +12 V | 3   | GND     | 13  | GND    |
| 4       | GND     | 4   | -12 V | 4   | +5 V    | 14  | PS-ON  |
| 5       | +5 V    | 5   | GND   | 5   | GND     | 15  | GND    |
|         |         | 6   | GND   | 6   | +5 V    | 16  | GND    |
|         |         | 7   | GND   | 7   | GND     | 17  | GND    |
|         |         | 8   | GND   | 8   | NC      | 18  | -5 V   |
|         |         | 9   | -5 V  | 9   | 5 V STB | 19  | +5 V   |
|         |         | 10  | +5 V  | 10  | +12 V   | 20  | +5 V   |
|         |         | 11  | +5 V  |     |         |     |        |
|         |         | 12  | +5 V  |     |         |     |        |

| J1  |         |
|-----|---------|
| PIN | NAME    |
| 1   | 5 V STB |
| 2   | GND     |
| 3   | PS-ON   |

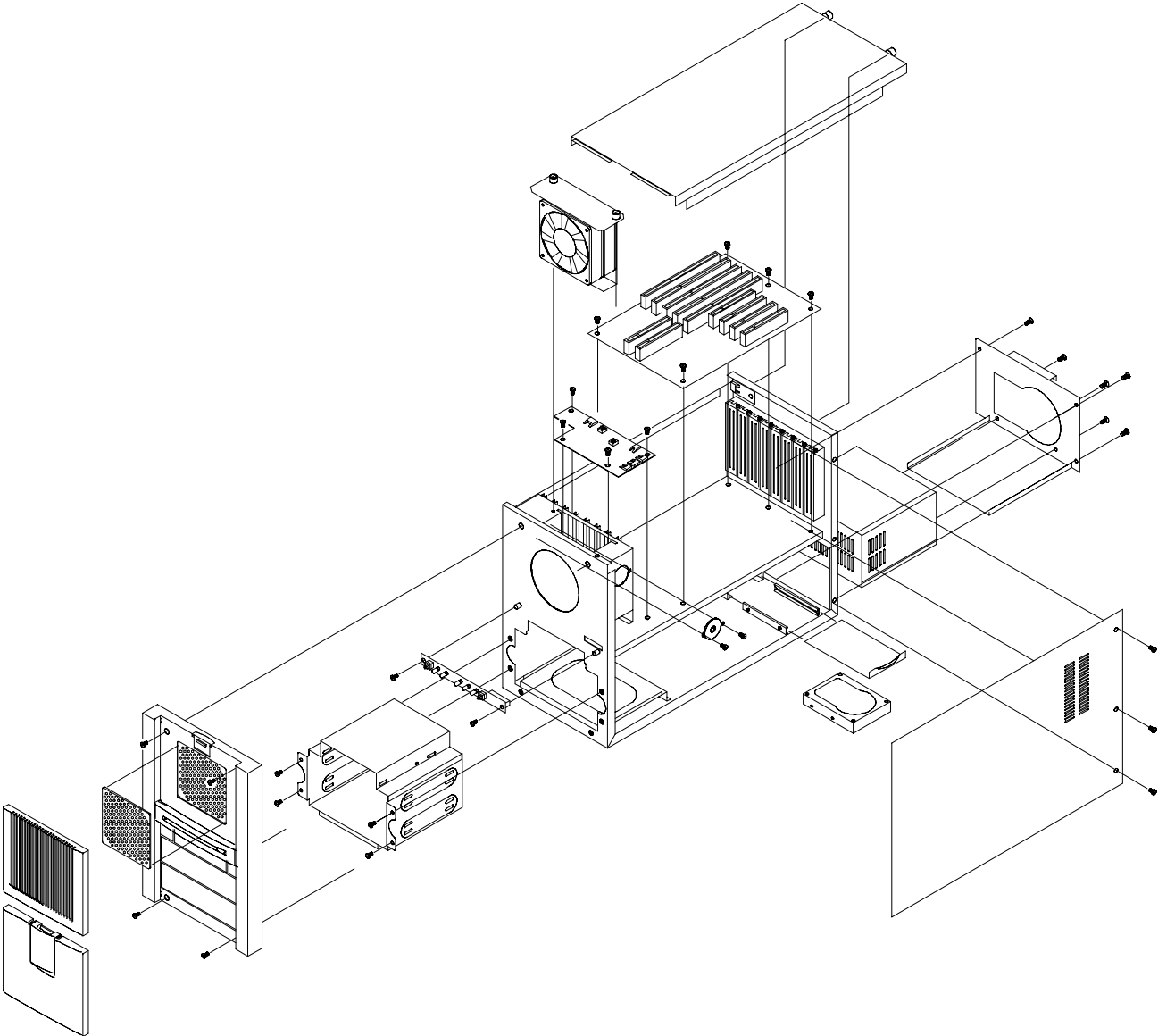
  

| JP2    |                            |
|--------|----------------------------|
| Closed | ATX power supply power ON  |
| Open   | ATX power supply power OFF |

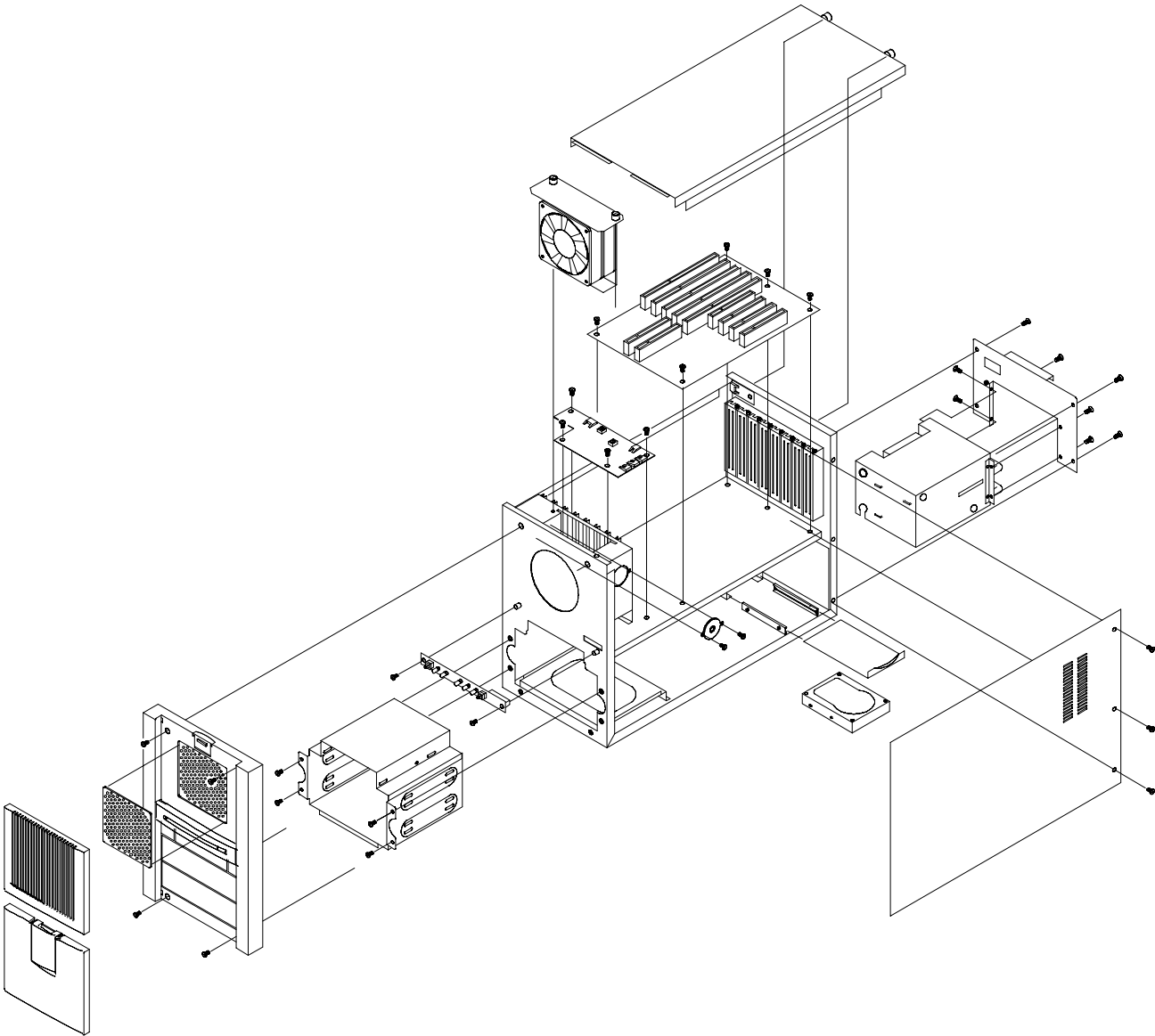
# Appendix B Exploded Diagrams

## Chassis with PS/2 power supply

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# Chassis with redundant power supply



# Appendix C Safety Instructions

## C.1 English

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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.

## C.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 autorisiertem Servicepersonal geöffnet werden.
14. Wenn folgende Situationen auftreten ist das Gerät vom Stromnetz zu trennen und von einer qualifizierten Servicestelle zu überprüfen:
  - a. Netzkabel oder Netzstecker sind beschädigt.
  - b. Flüssigkeit ist in das Gerät eingedrungen.
  - c. Das Gerät war Feuchtigkeit ausgesetzt.
  - d. Wenn das Gerät nicht der Bedienungsanleitung entsprechend funktioniert oder Sie mit Hilfe dieser Anleitung keine Verbesserung erzielen.
  - e. Das Gerät ist gefallen und/oder das Gehäuse ist beschädigt.
  - f. Wenn das Gerät deutliche Anzeichen eines Defektes aufweist.
15. 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 könnten.

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.