

IPC-610 Series
Industrial Chassis
User's Manual

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Note:

There are several special versions of the IPC-610 also available and the naming rules are IPC-610xx-xxxxx, IPC-610xxH-xxxx and IPC-610xxL-xxxx. For example, the IPC-610MB-xxxxx is designed to use the popular and inexpensive "ATX" form-factor motherboards. The IPC-610xx-25Zxx is designed to use the popular "ATX" 250 W PFC (power factor correction) power supply.
For more detailed information, contact your local dealer.

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Contents

CHAPTER 1 GENERAL INFORMATION	2
1.1-1 INTRODUCTION OF IPC-610- H.....	2
1.1-2 SPECIFICATIONS OF IPC-610- H.....	2
1.1-3 DIMENSION DIAGRAM OF IPC- 610- H	3
1.2-1 INTRODUCTION OF IPC-610- L	4
1.2-2 SPECIFICATIONS OF IPC- 610- L.....	4
1.2-3 DIMENSION DIAGRAM OF IPC-610- L.....	5
1.3-1 INTRODUCTION OF IPC-610- E	6
1.3-2 SPECIFICATIONS OF IPC-610- E.....	6
1.3-3 DIMENSION DIAGRAM OF IPC-610- E.....	7
1.4-1 INTRODUCTION OF IPC-610-F.....	8
1.4-2 SPECIFICATIONS OF IPC-610-F	8
1.4-3 DIMENSION DIAGRAM OF IPC- 610- F	9
1.5 PASSIVE BACKPLANE OPTIONS	10
1.6 POWER SUPPLY OPTIONS.....	10
CHAPTER 2 SYSTEM SETUP	12
2.1 SYSTEM SETUP OF IPC-610-H.....	12
2.1.1 <i>Attaching the handles and removing the top cover</i>	12
2.1.2 <i>Adding and removing disk drivers</i>	12
2.1.3 <i>Chassis front panel sections</i>	12
2.1.4 <i>Momentary switch</i>	12
2.1.5 <i>Replacing cooling fan and filter</i>	13
2.2 SYSTEM SETUP OF IPC-610- L.....	14
2.2.1 <i>Attaching the handles and removing the top cover</i>	14
2.2.2 <i>Adding and removing disk drivers</i>	14
2.2.3 <i>Chassis front panel sections</i>	14
2.2.4 <i>Momentary switch</i>	14
2.2.5 <i>Replacing cooling fan and filter</i>	14
2.3 SYSTEM SETUP OF IPC-610-E	15
2.3.1 <i>Removing the cover</i>	15
2.3.2 <i>Adding your disk drives</i>	15
2.3.3 <i>The hold-down clamp</i>	16

2.3.4	Connecting the keyboard.....	16
2.3.5	Replacing the filter.....	17
2.4	SYSTEM SETUP OF IPC-610-F.....	18
2.4.1	Removing the cover.....	18
2.4.2	Adding your disk drives.....	19
2.4.3	The hold-down clamp.....	20
2.4.4	Replacing the filter.....	21
2.4.5	The cooling fan.....	22
2.4.6	Installing the power supply and changing the rear cover and window.....	23

APPENDIX A EXPLODED DIAGRAMS..... 25

A.1	IPC-610- H EXPLODED DIAGRAM.....	25
A.2	IPC-610- L EXPLODED DIAGRAM.....	26
A.3	IPC-610- E EXPLODED DIAGRAM.....	27
A.4	IPC-610- F EXPLODED DIAGRAM.....	28

APPENDIX B SAFETY INSTRUCTIONS..... 30

Figures

Figure 1.1-1: Dimension diagram of IPC-610-H	3
Figure 1.2-1: Dimension diagram of IPC-610-L	5
Figure 1.3-1: Dimension diagram of IPC-610-E	7
Figure 1.4-1: Dimension diagram of IPC-610-F	9
Figure 2.1-1: Front panel section	12
Figure 2.1-2: Cooling fan & filter	13
Figure 2.2-1: Front panel section	14
Figure 2.2-2: Cooling fan & filter	14
Figure 2.3-1: Removing the cover	15
Figure 2.3-2: Inserting/removing the drive bay	16
Figure 2.3-3: Inserting the drives into the drive bay	16
Figure 2.3-4: Detaching the hold-down clamp	16
Figure 2.3-5: Inserting the rubber buffers	16
Figure 2.3-6: Front keyboard connection	17
Figure 2.3-7: Rear keyboard connection	17
Figure 2.3-8: Replacing the filter	17
Figure 2.4-1: Removing the cover	18
Figure 2.4-2: Inserting/removing the drive bay	19
Figure 2.4-3: Inserting the drives into the drive bay	19
Figure 2.4-4: Detaching the hold-down clamp	20
Figure 2.4-5: Inserting the rubber buffers	20
Figure 2.4-6: Replacing the filter	21
Figure 2.4-7: Cooling fan	22
Figure 2.4-8: IPC-610-F with backplane version	23
Figure 2.4-9: IPC-610-F with motherboard version	23
Figure A.1: IPC-610-H exploded diagram	25
Figure A.2: IPC-610-L exploded diagram	26
Figure A.3: IPC-610-E exploded diagram	27
Figure A.4: IPC-610-F exploded diagram	28

Tables

Table 1.1-1: Specifications of IPC-610-H	2
Table 1.2-1: Specifications of IPC-610-L	4
Table 1.3-1: Specifications of IPC-610-E	6
Table 1.4-1: Specifications of IPC-610-F	8
Table 1.5-1: Passive Backplane Options	10
Table 1.6-1: Power Supply Options	10

CHAPTER



General Information

Chapter 1 General Information

1.1-1 Introduction of IPC-610- H

The IPC-610-H is a 4U-high 14-slot rackmount industrial computer chassis designed for mission-critical applications. The unit includes a versatile 14-slot passive backplane, high-efficiency 300W ATX with PFC (power factor correction) power supply and dual easy maintenance cooling fans.

A front viewable system status LED supports the power, HDD and system voltages activity. Advanced cooling system by dual high CFM fans provides the sufficient flow to cool system key components. The front accessible USB I/O interface can be connected with a wide range of peripherals device for data transfer, backup and input. Flexible mechanical design supports single PS/2 or redundant power supply through a power bracket replacement.

All these outstanding features make IPC-610-H the best choice for price performance and total cost ownership

1.1-2 Specifications of IPC-610- H

		Front-accessible	Internal
Drive Bay	3.5"	1	
	5.25"	3	
Cooling	Fan	2(84 CFM/each)	
	Air Filter	Yes	
I/O Interface	USB	1(front-accessible)	
	PS/2	1(front-accessible)	
Miscellaneous	Front LED Indicator	LED display for power on, HDD and voltages activity	
	Rear panel	D-SUB 9-pin and 25-pin bracket	
Environment		Operating	Non-Operating
	Temperature	0 ~ 40 °C (32 ~ 104 °F)	-20 ~ 60 °C (-4 ~ 140 °F)
	Humidity	10 ~ 85%	10 ~ 95 %
	Vibration (5-500-Hz)	1 Grms	2 G
	Shock	10 G(With 11 msec duration, 1/2 sine wave)	30G
	Altitude	10,000 ft	40,000 ft
	Acoustic Noise	Less than 52dB sound pressure at 5~28°C (41~82°F)	
Physical	Dimensions (W x H x D)	482 x 177 x 480 mm (19" x 7" x 18.9")	
	Weight	10.2 kg (22.5 lb)	
Compliance	Safety	CE compliant, UL/cUL approved	

1.1-3 Dimension Diagram of IPC-610-H

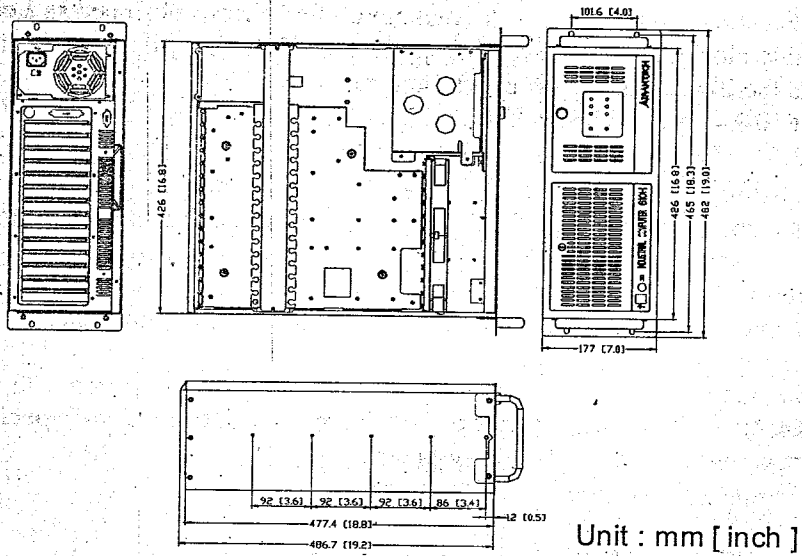


Figure 1.1-1: Dimension diagram of IPC-610-H

2-1 Introduction of IPC-610-L

IPC-610-L is a 4U height 14-slot rackmount IPC chassis designed as a core building block for mission-critical applications. This rugged, all-steel chassis meets the EIA RS-310C 19" rack mount standard.

IPC-610-L comes with shockproof and front accessed driver bay, three 5.25" & one 3.5". The unit includes a versatile 14-slot passive-backplane and ATX M/B form factor, a high-efficiency 250W ATX with PFC (power factor correction) power supply and with one front accessible easy maintenance cooling fan which provides abundant cooling. For the high density requirements, IPC-610-L supports 12 full-length slots or a 12" x 9.6" form factor M/B. The flexible mechanical design provides PS/2 size single or redundant power supply through a power supply bracket replacement.

A wide range of standard computing peripherals can be integrated with the chassis to meet various application developments under mission-critical environment 24 hours a day, 7 days a week.

2-2 Specifications of IPC-610-L

Table 1.2-1: Specifications of IPC-610-L

		Front-accessible	Internal
Drive Bay	3.5"	1	
	5.25"	3	
Cooling	Fan	1(84 CFM/each) and front accessible	
	Air Filter	Yes	
Miscellaneous	Front LED Indicator	LED display for power on and HDD activity	
	Rear panel	D-SUB 9-pin and 25-pin bracket	
Environment		Operating	Non-Operating
	Temperature	0 ~ 40 °C (32 ~ 104 °F)	-20 ~ 60 °C (-4 ~ 140 °F)
	Humidity	10 ~ 85%	10 ~ 95 %
	Vibration (5-500 Hz)	1 Grms	2 G
	Shock	10 G (With 11 msec duration, 1/2 sine wave)	30G
	Altitude	10,000 ft	40,000 ft
	Acoustic Noise	Less than 52dB sound pressure at 5~28°C.(41~82°F)	
Physical	Dimensions (W x H x D)	482 x 177 x 480 mm (19" x 7" x 18.9")	
	Weight	10.2 kg (22.5 lb)	
Compliance	Safety	CE compliant, UL/cUL approved	

1.2-3 Dimension Diagram of IPC-610- L

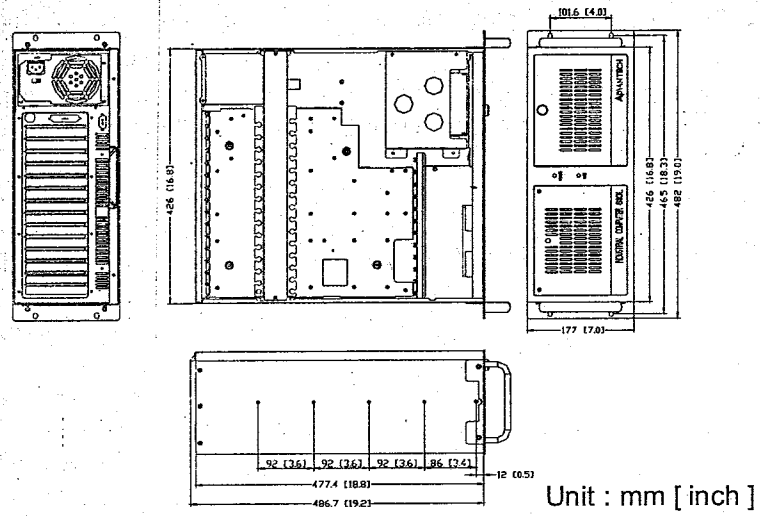


Figure 1.2-1: Dimension diagram of IPC-610-L

1.3-1 Introduction of IPC-610-E

The IPC-610-E is a PC/AT-compatible computer designed for industrial applications. This rugged, all-steel chassis meets the EIA RS-310C 19" rackmount standard. The unit includes a 14-slot PC-bus compatible passive backplane, and a more efficient switching power supply in a single fan-cooled chassis.

The passive backplane configuration of the IPC-610-E minimizes downtime, simplifies troubleshooting, makes upgrading easier, and allows for a more efficient system package. All electronic components are modular in design and can be easily serviced. The IPC-610-E accommodates most plug-in cards, including CPU, video, disk controller, and I/O interface cards. They can be conveniently installed and replaced from the top of the unit.

The IPC-610-E will withstand shock, vibration, dust, and a wide range of operating temperatures in harsh industrial environments. The chassis is positively pressurized by filtered cooling fan to exclude dust and dirt. A lockable door protects drives and switches from tampering and foreign particles.

1.3-2 Specifications of IPC-610-E

		Front-accessible	Internal
Drive Bay	3.5"	2	1
	5.25"	2	
Cooling	Fan	1(84 CFM/each)	
	Air Filter	Yes	
I/O Interface	K/B Connector	1(front-accessible 6-pin DIM connector)	
Miscellaneous	LED Indicator	LED display for PWR, HDD and KB-LK (behind the door)	
	Switch Rear panel	Reset, KB-LK and Power (behind the door) D-SUB 9-pin and 25-pin bracket	
Environment		Operating	Non-Operating
	Temperature	0 ~ 40 °C (32 ~ 104 °F)	-20 ~ 60 °C (-4 ~ 140 °F)
	Humidity	10 ~ 85%	10 ~ 95 %
	Altitude	10,000 ft	40,000 ft
	Acoustic Noise	Less than 52dB sound pressure at 5~28°C (41~82°F)	
Physical	Dimensions (W x H x D)	482 x 177 x 452 mm (19" x 7" x 17.8")	
	Weight	10.2 kg (22.5 lb)	
Compliance	Safety	CE compliant, UL/eUL approved	

1.3-3 Dimension Diagram of IPC-610- E

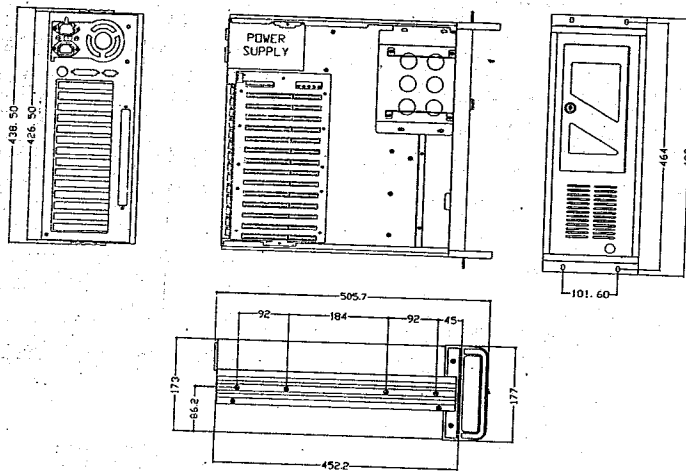


Figure 1.3-1: Dimension diagram of IPC-610-E

1.4-1 Introduction of IPC-610-F

The IPC-610-F is a PC/AT-compatible computer designed for industrial applications. This rugged, all-steel chassis meets the EIA RS-310C 19" rackmount standard. The unit includes a 14-slot passive backplane, and a more efficient switching power supply in a single fan-cooled chassis. The passive backplane configuration of the IPC-610-F minimizes downtime, simplifies troubleshooting, makes upgrading easier, and allows for a more efficient system package. All electronic components are modular in design and can be easily serviced. The IPC-610-F accommodates most plug-in cards, including CPU, video, disk controller, and I/O interface cards. They can be conveniently installed and replaced from the top of the unit. The IPC-610-F will withstand shock, vibration, dust, and a wide range of operating temperatures in harsh industrial environments. The chassis is positively pressurized by two filtered push-pull cooling fans to exclude dust and dirt. A lockable door protects drives and switches from tampering and foreign particles.

1.4-2 Specifications of IPC-610-F

		Front-accessible	Internal
Drive Bay	3.5"	1	1
	5.25"	3	
Cooling	Fan	1(84 CFM/each)	
	Air Filter	Yes	
Miscellaneous	LED Indicator	LED display for PWR, HDD and KB-LK (behind the door)	
	Switch Rear panel	Reset, KB-LK and Power switch (behind the door) D-SUB 9-pin and 25-pin bracket	
Environment	Temperature	Operating	Non-Operating
		0 ~ 40 °C (32 ~ 104 °F)	-20 ~ 60 °C (-4 ~ 140 °F)
	Humidity	10 ~ 85%	10 ~ 95 %
	Vibration (5-500 Hz)	1 Grms	2 G
	Shock	10 G (With 11 msec duration, 1/2 sine wave)	30G
	Altitude	10,000 ft	40,000 ft
	Acoustic Noise	Less than 52dB sound pressure at 5~28°C (41~82°F)	
Physical	Dimensions (W x H x D)	482 x 177 x 450 mm (19" x 7" x 17.8") for BP 482 x 177 x 502 mm (19" x 7" x 19.8") for MB	
	Weight	10.2 kg (22.5 lb)	
Compliance	Safety	CE compliant, UL/cUL approved	

1.4-3 Dimension Diagram of IPC- 610- F

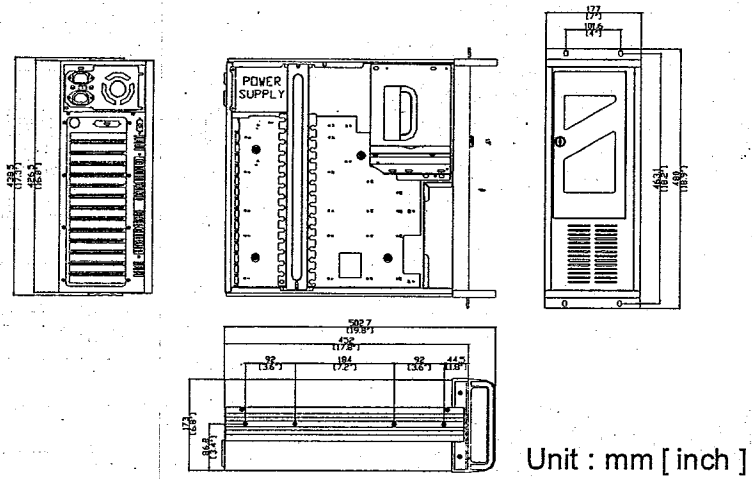


Figure 1.4-1: Dimension diagram of IPC-610-F

1.5 Passive Backplane Options

Table 1.5-1: Passive Backplane Options

3/P Model Name	Slot per Segment (ISA/PCI/CPU)	Segment
CA-6114-0B1	32-bit, 14-slot: 14 ISA	1
CA-6114P4-C	32-bit, 14-slot: 8 ISA, 4 PCI, 2 PICMG	1
CA-6114P7-0D1	32-bit, 14-slot: 4 ISA, 6 PCI, 3 PICMG, 1 PCI/ISA	1
CA-6114P10-B	32-bit, 14-slot: 2 ISA, 10 PCI, 2 PICMG	1
CA-6114P12-0B1	32-bit, 14-slot: 1 ISA, 11 PCI, 1 PICMG/PCI, 1 PICMG	1
CA-6114P12X-A1	64-bit, 14-slot: 1 ISA, 11 PCI, 1 PICMG/PCI, 1 PICMG	1
CA-6113P4R-0C1	32-bit, 13-slot: 7 ISA, 4 PCI, 2 PICMG	1
CA-6113P7X	64-bit, 13-slot: 4 ISA, 7 PCI, 2 PICMG	1

1.6 Power Supply Options

Table 1.6-1: Power Supply Options

Model Name	Watt	Input	Output	Mini-load	Safety & MTFB
PB-250ATX-Z	250W ATX, PFC	95 ~ 132 Vac 190 ~ 264 Vac (Selected)	+5V@ 27A +3.3V@20A +12V@13A -12V@0.8A -5V@0.3A +5Vsb@2A	+5 V @ 0.5 A +3.3 V @ 0.3 A	UL/CSA/TUV/ CCC 100,000 hours @25°C(Full load)
PB-300ATX-ZB	300W ATX, PFC	90 ~ 264 Vac (Full-range)	+5V@ 30A +3.3V@28A +12V@15A -12V@0.8A -5V@0.3A +5Vsb@2A	+5 V @0.1 A +3.3 V @ 0.3 A	UL/cUL/CSA/CB/ CCC/TUV/CE EN61000-3-2 ClassD/Nordic 100,000 hours @25°C(275W load)
RS-300ATX-Z (Optional to IPC-610-H)	300W (1+1) ATX, PFC	90 ~ 264 Vac (Full-range)	+5Vsb@2A +5V@ 25A +3.3V@18A +12V@16A -12V@0.5A -5V@0.5A +5Vsb@2A	+5Vsb@0.1A +5V@ 3A +3.3V@1A +12V@2A +5Vsb@0.1A	UL/CCC/CB/TUV CE (EN61000-3-2 Class D) FCC Class B 150,000 hours @25°C (Full load)

CHAPTER

2

System Setup

Chapter 2 System Setup

2.1 System Setup of IPC-610-H

2.1.1 Attaching the handles and removing the top cover

The handles for the front panel are in the accessory box. To install the handles, simply secure them to the front panel with the screws provided. Please remove the chassis cover by releasing two screws, which are on the rear of chassis.

2.1.2 Adding and removing disk drivers

Undo the four screws of cushion to release disk enclosure from chassis, and then you could move disk enclosure out of chassis to install or remove the necessary 5.25" and 3.5" disk drivers.

2.1.3 Chassis front panel sections

Refer Figure 2.1-1 to find USB, PS/2 keyboard connector, system LED display, power switch and system reset location.

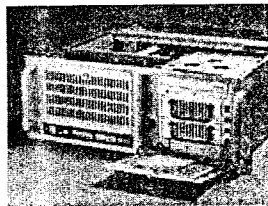


Figure 2.1-1: Front panel section

If you want to connect any USB device or PS/2 keyboard to the system, you could use the front accessible USB & PS/2 connectors. The system LED display is on front of door cover and shows system power status, system voltages, and HDD activity. Power switch and system reset are behind the door.

2.1.4 Momentary switch

Use momentary switch and by way of ATX (PS_ON) function to turn on system ATX power supply. Please use system shutdown to turn off system power automatic or press momentary switch for a while to turn off system power.

2.1.5 Replacing cooling fan and filter

Refer Figure 2.1-2 to find location of system cooling fan and filter. Please replace system cooling fan if it is defective; replacing or clearing filter when the dust is too heavy.

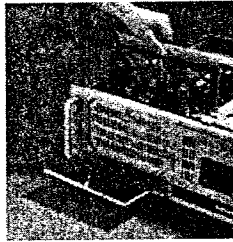


Figure 2.1-2: Cooling fan & filter

2.2 System Setup of IPC-610- L

2.2.1 Attaching the handles and removing the top cover

The handles for the front panel are in the accessory box. To install the handles, simply secure them to the front panel with the screws provided. Please remove the chassis cover by releasing two screws which are on the rear of chassis.

2.2.2 Adding and removing disk drivers

Undo the four screws of cushion to release disk enclosure from chassis, and then you could move disk enclosure out of chassis to install or remove the necessary 5.25' and 3.5' disk drivers

2.2.3 Chassis front panel sections

Refer Figure 2.2-1 to find system power LED and HDD LED on front bezel; power switch and system reset which are behind the door.

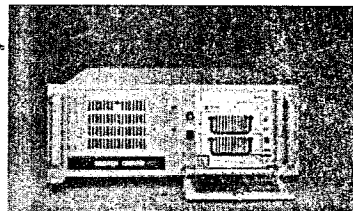


Figure 2.2-1: Front panel section

2.2.4 Momentary switch

Use momentary switch and by way of ATX (PS_ON) function to turn on system ATX power supply. Please use system shutdown to turn off system power automatic or press momentary switch for a while to turn off system power.

2.2.5 Replacing cooling fan and filter

Refer Figure 2.2-2 to find location of system cooling fan and filter. Please replace system cooling fan if it is defective; replace or clearing filter when the dust is too heavy.

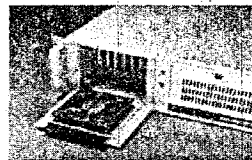


Figure 2.2-2: Cooling fan & filter

2.3 System Setup of IPC-610-E

Setting up your IPC-610-E 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 keyboard you plan to use.

A lockable door is located on the chassis front cover, providing access to the control panel. This offers protection and security against damage and unauthorized access. The control panel functions include power on/off, keyboard lock, reset switch, and three LED indicators (power on, keyboard lock and HDD) to assist in monitoring system status. On the rear panel there is a grounding point (earth point) located on the bottom right hand corner. This provides an earth for the whole system and is attached via a screw.

WARNING! *Disconnect all power from the chassis before you install the CPU cards. Unplug the power cord from the wall; turning off the power switch alone is not sufficient.*



If you are not sure what to do, take the job to an experienced professional.

2.3.1 Removing the cover

There are screws which secure the cover to the chassis. They are along the sides, near the top. Remove them, and then slide the cover to the rear of the chassis.

See Figure 2.3-1 below:

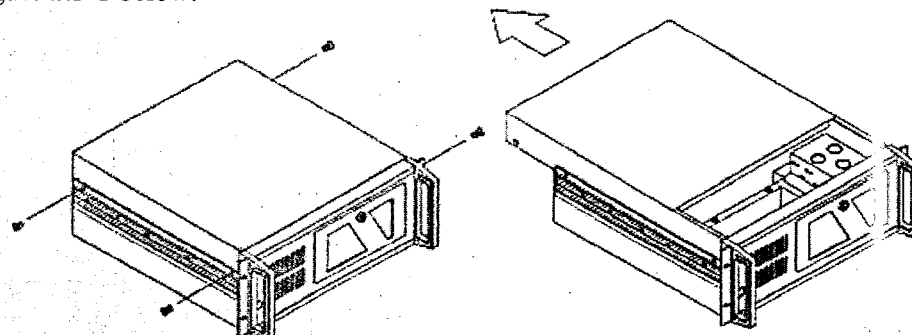


Figure 2.3-1: Removing the cover

2.3.2 Adding your disk drives

1. Remove the four outer screws which mount the shock-resistant drive-bay to the chassis. (See Figure 2.3-2)
2. Slide the drive bay about 2 cm toward the rear, to a location where it is not obstructed by the upper rim. Lift it free of the chassis.
3. Remove the cover to the drive bay front and insert the drives into their proper locations in the drive bay. (See Figure 2.3-3)

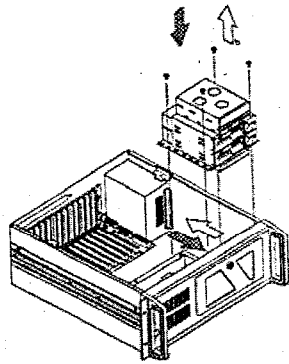


Figure 2.3-2: Inserting/removing the drive bay

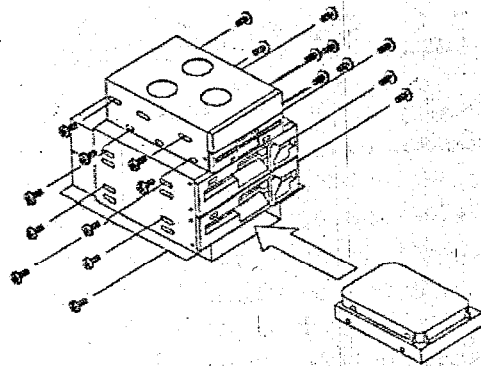


Figure 2.3-3: Inserting the drives into the drive bay

2.3.3 The hold-down clamp

The IPC-610-E uses a hold-down clamp to ensure the plug-in cards are securely fastened. It also offers protection against shock and vibration. To install your cards into the passive backplane, proceed as follows:

1. Detach the hold-down clamp by removing the two screws located at each end and lifting it off the chassis. (See Figure 2.3-4)
2. Insert the rubber buffers (provided) into the hold-down clamp. These buffers offer the plug-in cards two levels of protection against vibration. (See Figure 2.3-5)

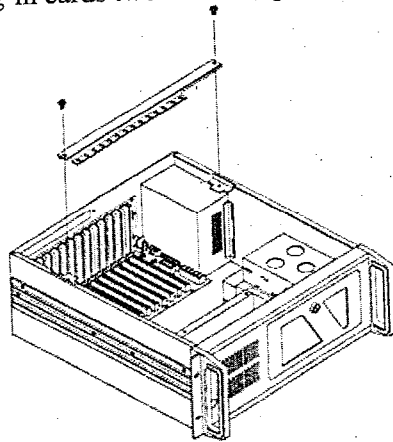


Figure 2.3-4: Detaching the hold-down clamp

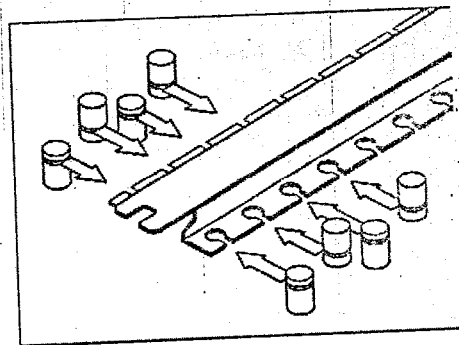


Figure 2.3-5: Inserting the rubber buffers

2.3.4 Connecting the keyboard

Two 5-pin DIN keyboard connectors, wired in parallel, are provided. One is on the front panel, near the fan intake; and one is on the rear of the chassis, next to the power supply. You may connect your keyboard to either. Note that both connectors are notched for correct orientation. (See Figures 2.3-6 and 2.3-7 below)

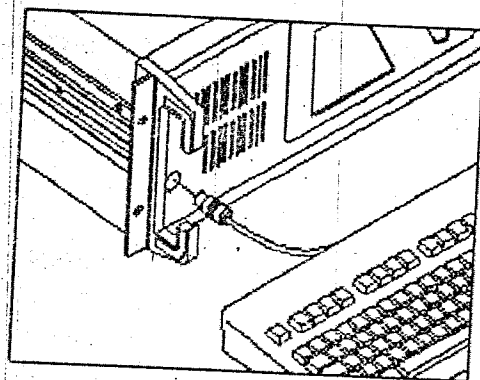


Figure 2.3-6: Front keyboard connection

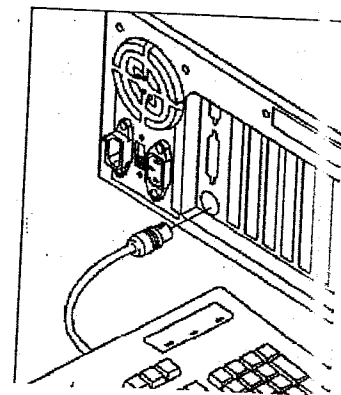


Figure 2.3-7: Rear keyboard connection

2.3.5 Replacing the filter

The filter is located next to the lockable door. Under continuous use, the filter should be removed about once a month. To replace the filter, refer to Figure 2.3-8 below and do the following:

1. Open the lockable door.
2. Take the filter out by gently pulling the tab and sliding the filter to the right.
3. Slide a new filter in until it snaps into place.
4. Close and lock the lockable door.

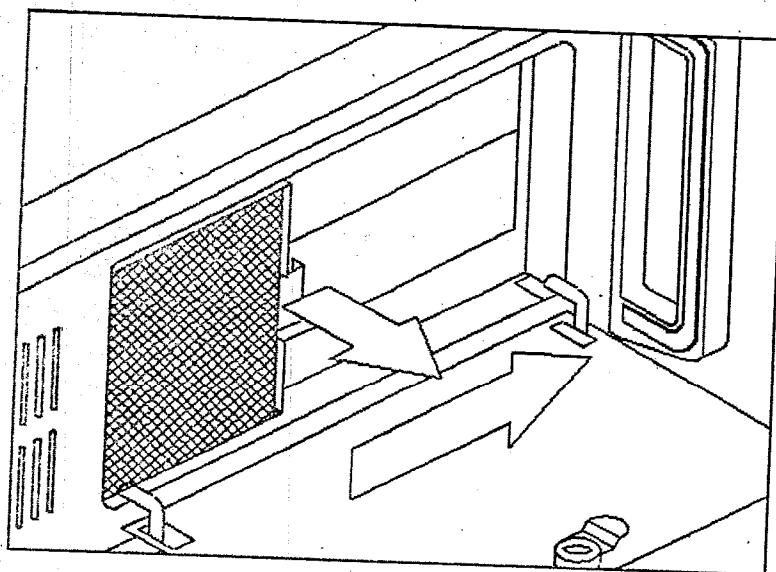


Figure 2.3-8: Replacing the filter

2.4 System Setup of IPC-610-F

Setting up your IPC-610-F requires only a screwdriver and a small amount of time. Before you begin, you should also gather all of the cards you plan to install, as well as the keyboard you plan to use.

A lockable door is located on the chassis front cover, providing access to the control panel. This offers protection and security against damage and unauthorized access. The control panel functions include power on/off, keyboard lock, reset switch, and three LED indicators (power on, keyboard lock and HDD) to assist in monitoring system status. On the rear panel there is a grounding point (earth point) located on the bottom right hand corner. This provides an earth for the whole system and is attached via a screw.

WARNING: *Disconnect all power from the chassis before you install the CPU cards. Unplug the power cord from the wall; turning off the power switch alone is not sufficient. If you are not sure what to do, take the job to an experienced professional.*



2.4.1 Removing the cover

There are screws which secure the cover to the chassis. They are along the sides, near the top. Remove them, and then slide the cover to the rear of the chassis. See Figure 2.4-1 below:

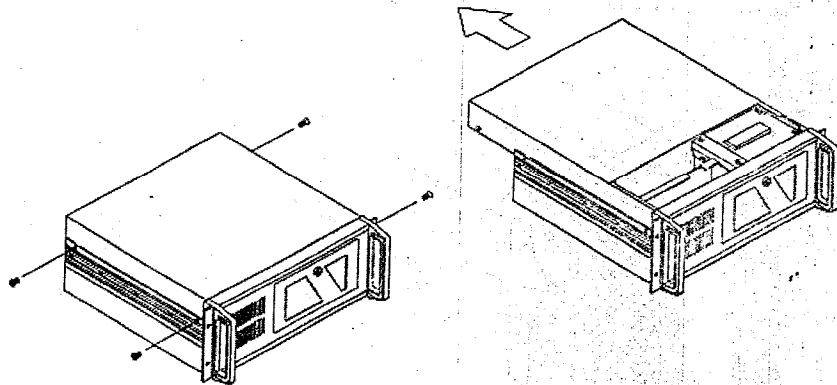


Figure 2.4-1: Removing the cover

2.4.2 Adding your disk drives

1. Remove the four outer screws which mount the shock-resistant drive-bay to the chassis. (See Figure 2.4-2)
2. Slide the drive bay about 2 cm toward the rear, to a location where it is not obstructed by the upper rim. Lift it free of the chassis.
3. Remove the cover to the drive bay front and insert the drives into their proper locations in the drive bay. (See Figure 2.4-3)

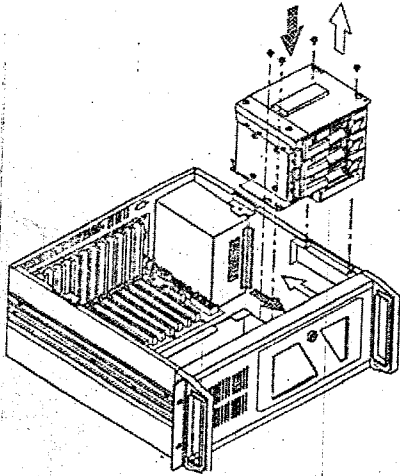


Figure 2.4-2: Inserting/removing the drive bay

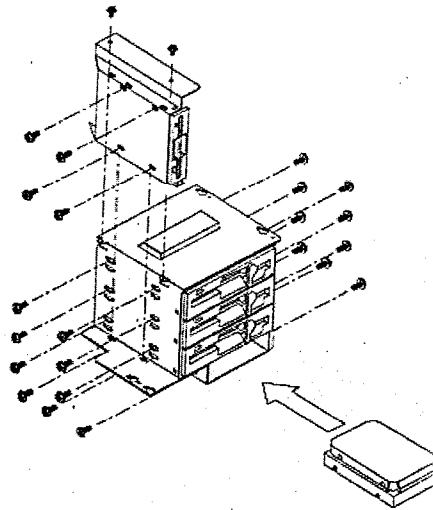


Figure 2.4-3: Inserting the drives into the drive bay

2.4.3 The hold-down clamp

The IPC-610-F uses a hold-down clamp to ensure the plug-in cards are securely fastened. It also offers protection against shock and vibration. To install your cards into the passive backplane, proceed as follows:

1. Detach the hold-down clamp by removing the two screws located at each end and lifting it off the chassis. (See Figure 2.4-4)
2. Insert the rubber buffers (provided) into the hold-down clamp. These buffers offer the plug-in cards two levels of protection against vibration. (See Figure 2.4-5)

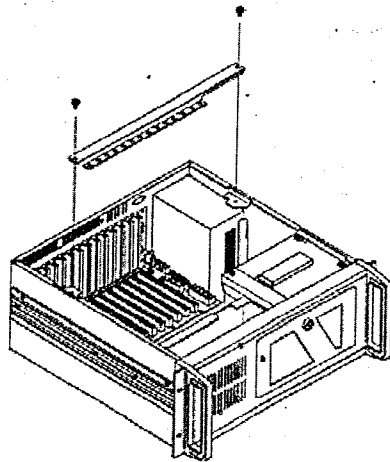


Figure 2.4-4: Detaching the hold-down clamp

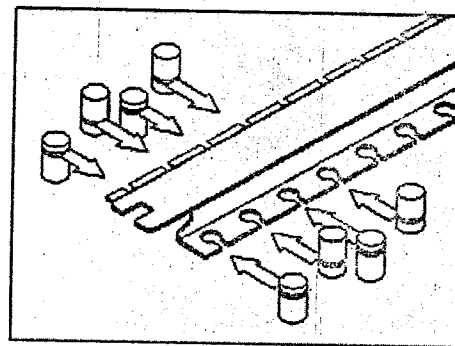


Figure 2.4-5: Inserting the rubber buffers

2.4.4 Replacing the filter

The filter is located next to the lockable door. Under continuous use, the filter should be removed about once a month. To replace the filter, refer to Figure 2.4-6 below and do the following:

1. Open the lockable door.
2. Take the filter out by gently pulling the tab and sliding the filter to the right.
3. Slide a new filter in until it snaps into place.
4. Close and lock the lockable door.

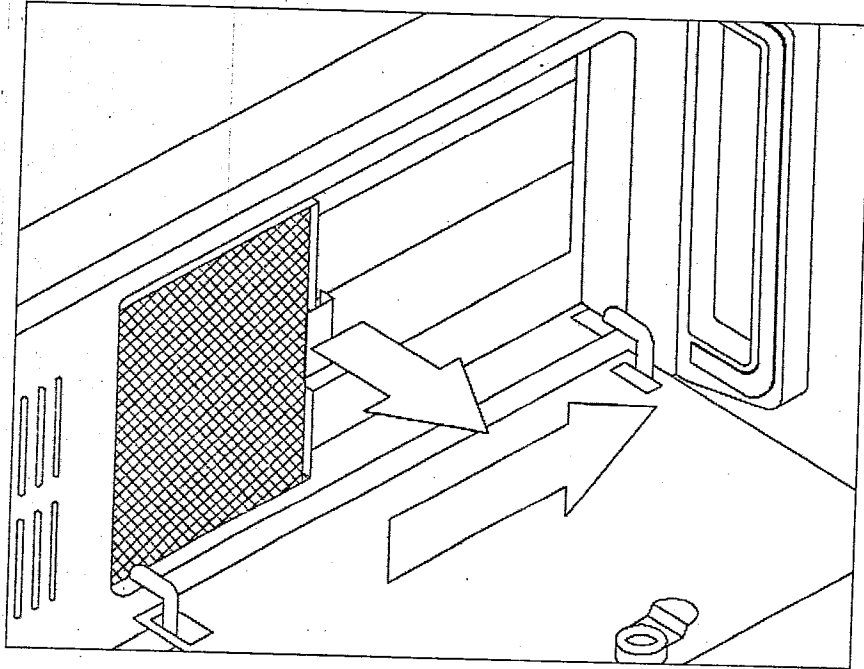


Figure 2.4-6: Replacing the filter

2.4.5 The cooling fan

The cooling fan which is inside the chassis is designed to be plugged into a connector for easy maintenance.

Please refer to Figure 2.4-7 below for illustration.

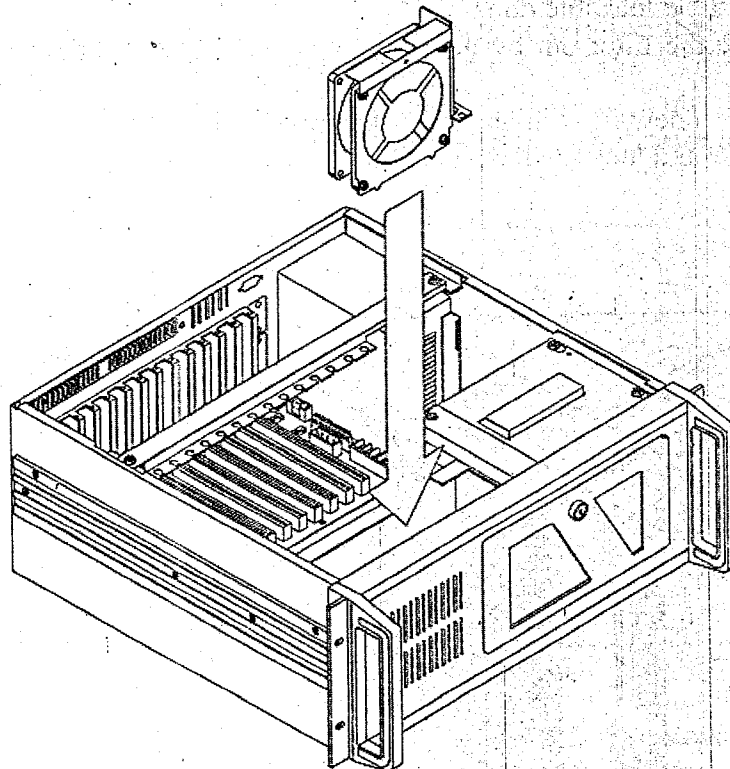


Figure 2.4-7: Cooling fan

2.4.6 Installing the power supply and changing the rear cover and window

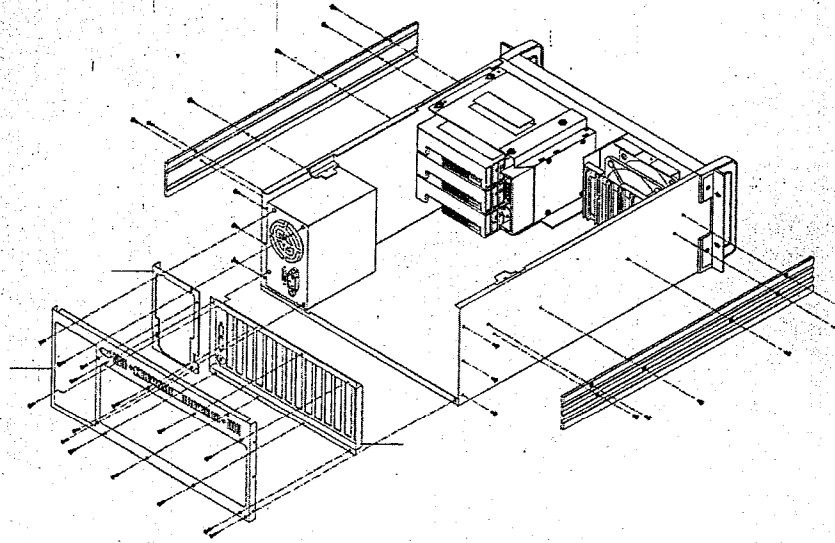


Figure 2.4-8: IPC-610-F with backplane version

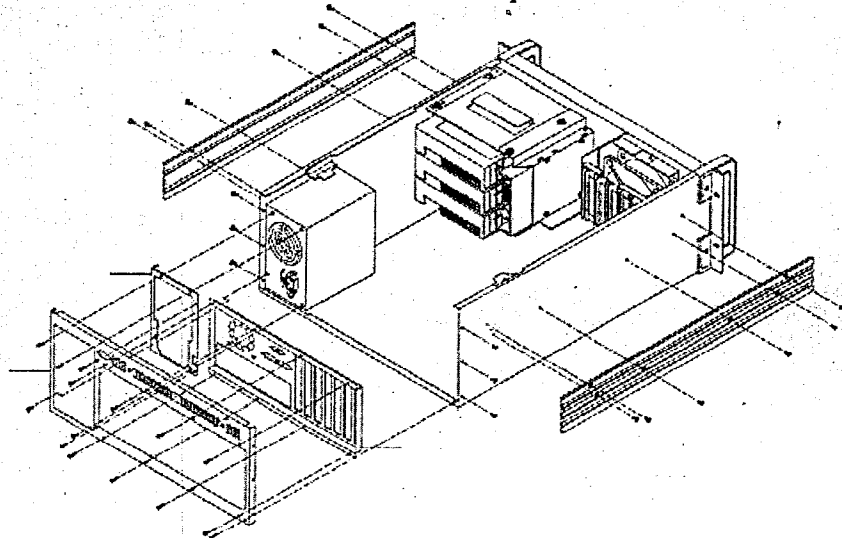


Figure 2.4-9: IPC-610-F with motherboard version

APPENDIX

A

Exploded Diagrams

Appendix A Exploded Diagrams
A.1 IPC-610- H Exploded Diagram

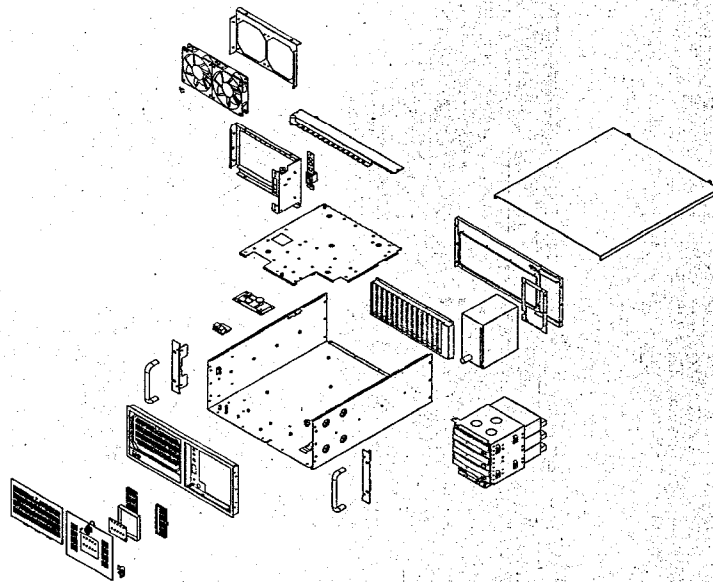


Figure A.1: IPC-610-H exploded diagram

A.2 IPC-610- L Exploded Diagram

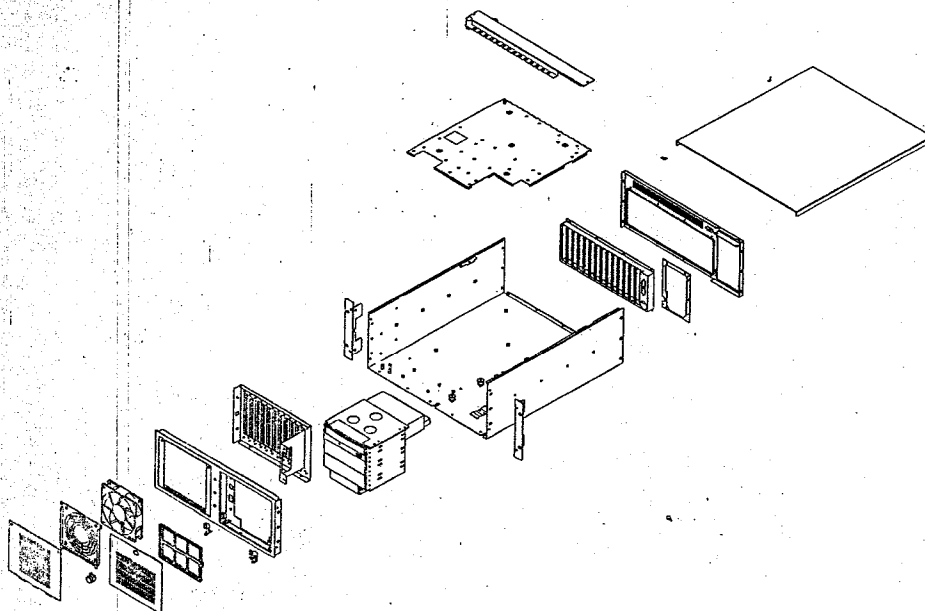


Figure A.2: IPC-610-L exploded diagram

A.3 IPC-610- E Exploded Diagram

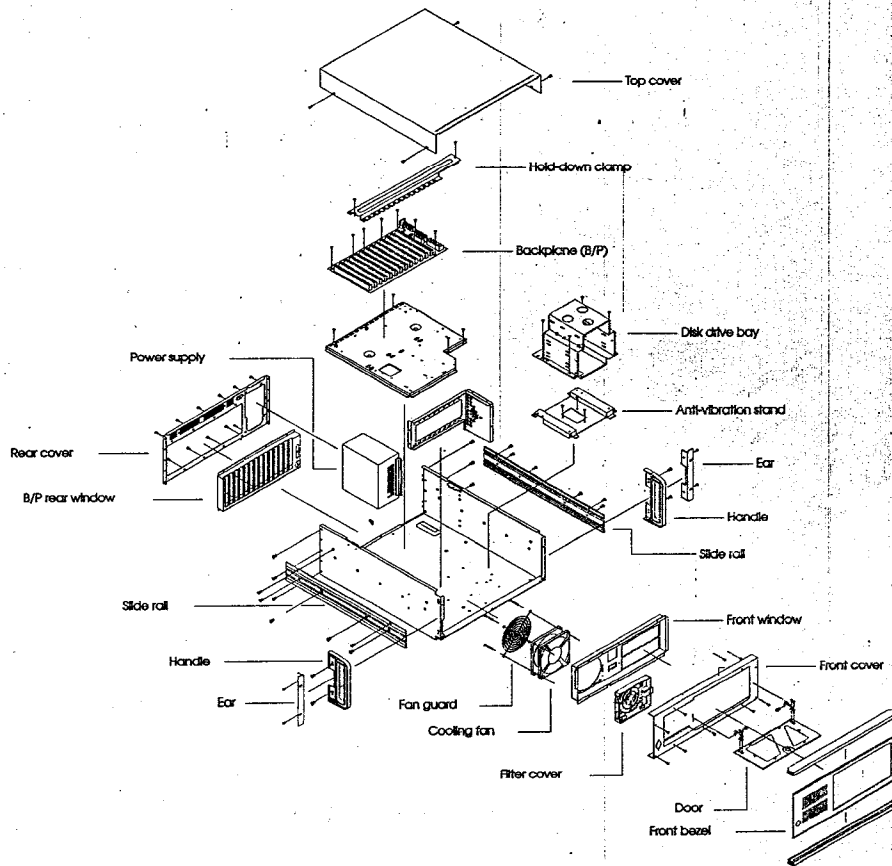


Figure A.3: IPC-610-E exploded diagram

A.4 IPC-610- F Exploded Diagram

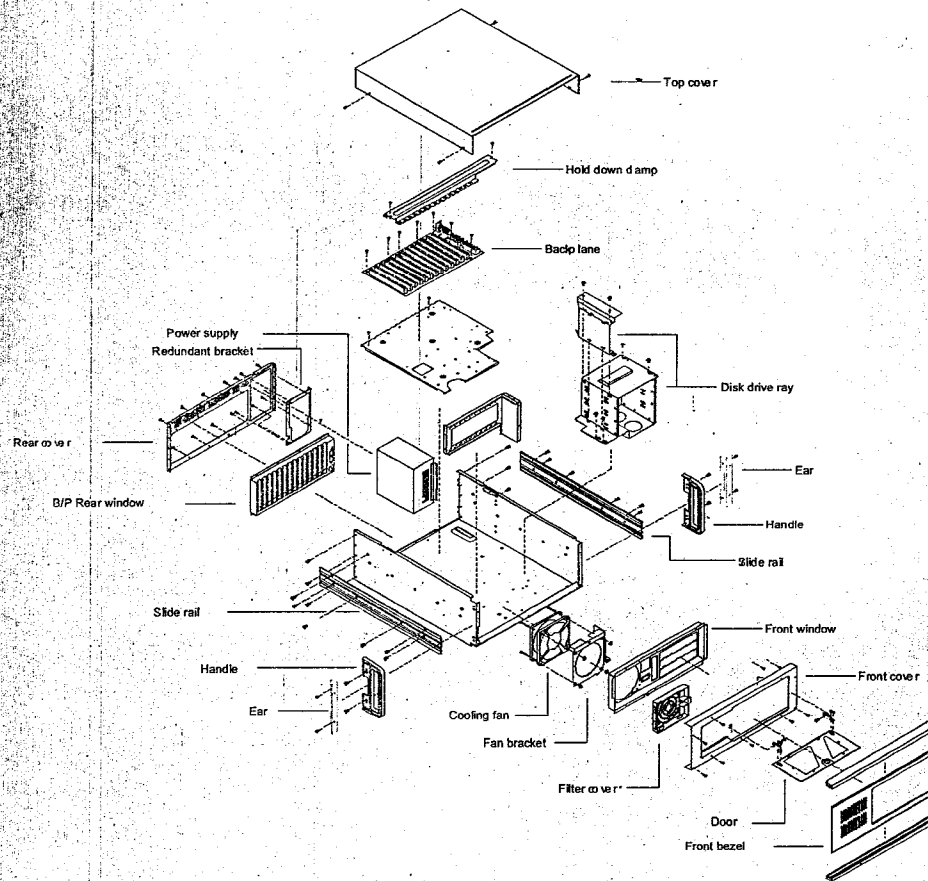


Figure A.4: IPC-610-F exploded diagram

APPENDIX

B

Safety Instructions

Appendix B Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User's Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Do not use a damp cloth, 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 over voltage.
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:
 - 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 user's manual.

e. The equipment has been dropped and damaged.

f. 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.**

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

16. Any insulation on conductors inside EQUIPMENT which connect ACCESSIBLE METAL PARTS or other PROTECTIVELY EARTHED parts with a protective function to the PROTECTIVE EARTH TERMINAL shall be identified by the colors green and yellow at least at the termination of the conductors.
17. **CAUTION:** The computer is provided with a Battery-powered Real-Time Clock Circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent typed recommended by the manufacturer. Discard use batteries according to the manufacturer's instructions.
18. The computer is provided with CD-ROM that complies with appropriate safety standards including IEC 60826.

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19. Install the computer. Before your begin make sure the Green/Yellow wire reliable connection between metal part of computer and ground of final system.