



特种计算机

Industrial Computer

产品说明书

User Manual

IPC-820

4U 上架机箱

4U Rack-mount Chassis

Version:C01

Legal Information

Warnings


Please pay attention to the tips within the manual so as to avoid personal injury or property losses. The tips for personal injury are indicated in warning triangles while the tips only related to property losses have no warning triangles. The warning tips are listed as follows with the hazardous scale from severe to slight.

 Danger

If handled carelessly, death or severe human injury will occur.

 Warning

If handled carelessly, death or severe human injury might occur.

 Caution

Warning triangle indicates that slight human injury might occur if handled carelessly.

Note

Unexpected result or status might occur, if not handled according to the tips.

Professional Personnel

The product/system covered by the manual can only be handled by qualified and professional personnel. During operation, please follow the respective instructive manuals, especially the safety warnings. The professional personnel have been trained and possess relevant experiences; therefore, he/she could be aware of the risks of the product/system and avoid possible damages.

EVOC Product

Please pay attention to the following instructions:

 Warning

EVOC product can only be used according to the descriptions within the manual, including the contents and the relevant technical documents. If the products or components from other companies are required, please get the recommendation and grant from EVOC first. Proper transportation, storage, assembly, installation, debugging, operation and maintenance are prerequisite to ensure product safety and normal operation; therefore, please ensure permitted environment conditions and pay attention to the tips within the manual.



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Warranty Terms:

The warranty on the product lasts for one year. If the user has additional requirements, the contract signed between the two sides shall prevail.

Please visit our website: <http://www.evoc.com> for more information, or send an email to the Technical Support Mailbox support@evoc.com (International) or support@evoc.cn (Domestic) for consultation.

Hotline: 4008809666

About this manual

Scope of the Manual


The manual is appropriate for EVOC IPC-820.

Convention

The term “the PC” or “the Product” within the manual usually stands for EVOC IPC-820.

Instructions

Safety instructions

To avoid property losses or individual injury, please pay attention to the safety instructions within the manual. The warnings within the manual are marked with warning triangle , whose existence is dependent upon the scale of the potential hazard.

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1. Product Introduction

1.1 Overview

IPC-820 is a 4U rack-mount chassis, which supports the complete range of full-size boards and industrial motherboards of our company, such as FSC, EPI, EPE, EC9 and EC0, etc. With built-in high speed fan, the product features excellent heat dissipation as well as excellent anti-vibration and EMC performance.

The product adopts reasonable architecture, advanced design and sheet metal front panel. The main body of the PC is shaped with high-quality steel sheet. The product also deploys dual binding strips structure, which can effectively fix the centre-of-gravity position. The protective system of integrated chassis and door panel with lock prevents unauthorized entry.

IPC-820 can be used in a wide range of fields, such as communication, networking, banking, electric power, transportation, industrial automation, etc.

1.2 Product Specifications

	Item	Definition
Main Functional Index	Expansion performance	<ul style="list-style-type: none"> ● Motherboards supported: PICMG 1.0 standard full-size card, PICMG 1.3 standard full-size card, EPI 2.0 standard full-size card, EPE standard full-size card, EC9 standard single board, EC0 standard single board; ● Supported carrier boards: 10-slot standard PICMG 1.0 carrier board, 14-slot standard PICMG 1.0 carrier board, 10-slot standard PICMG 1.3 carrier board, 13-slot standard EPI 2.0 carrier board, 10-slot standard EPE carrier board; ● Supported power supplies: standard PS2 ATX power supply, standard PS2 AT power supply.
	Storage expansion	<ul style="list-style-type: none"> ● 1 x 5.25" CD-ROM bay ● 2 x 3.5" HDD bay (with shock absorption) ● 1 x 3.5" HDD bay (without shock absorption)
	Ports and buttons on the chassis	<ul style="list-style-type: none"> ● Two front-accessible USB 2.0 ports ● ATX switch, reset switch, power indicator, HDD indicator, safety door with lock
	Dimensions (Excluding mounting ear)	482mm (W) x 177mm (H) x 470.4mm (D)
	Net weight	15.3Kg

	Temperature	<ul style="list-style-type: none"> ● Operating temperature: 0°C ~ 50°C ● Storage temperature: -20°C ~ 60°C
	Humidity	5 % ~ 90 % (Non-condensing)
	EMC	<ul style="list-style-type: none"> ● Limits of radio disturbance are compliant with GB9254-2008 class A; Immunity to conducted disturbances class A ● GB/T 17626.2-2006 Electrostatic Discharge, level 2; ● GB/T 17626.4-2006 Burst Immunity, level 2; ● GB/T 17626.6-2008 Conduction Immunity, Level 2 ● GB/T 17626.5-2008 Surge (Impact) Immunity, level 2; ● GB/T 17626.6-2008 Conducted Susceptibility, level 2;
	Reliability	<ul style="list-style-type: none"> ● MTBF ≥ 50000h ● MTTR ≤ 0.5h
	Safety	Meets basic requirements of GB4943.
	Mechanical and environmental adaptability	<ul style="list-style-type: none"> ● Anti-vibration: 5-17Hz/1.0mm amplitude; 17-200Hz/1.0g acceleration; ● Anti-shock: 10g acceleration, 11ms duration.
	Power	Input voltage/Frequency: 220VAC/50Hz

1.3 Status Monitoring and Specifications

1.3.1 Basic Functions

- 1). Display of CPU operating temperature;
- 2). Display of system operating temperature;

- 3). Power supply indication function;
- 4). Giving alarm for upper limit temperature of CPU or system;
- 5). Temperature measuring range: CPU $-10^{\circ}\text{C} \sim 110^{\circ}\text{C}$; SYSTEM $-40^{\circ}\text{C} \sim 80^{\circ}\text{C}$;
- 6). Temperature sampling duration: 3 seconds;
- 7). Saving set data for power failure;
- 8). Auto reminding for temperature over limit or sensor error (open or short)

1.3.2 Button Design

[SET] enter setup mode/switch setup object

[UP] Increase set value, 5°C for each click

[DOWN] Decrease set value, 5°C for each click

1.3.3 Operating Method

Click [SET] to enter setup status. Default CPU temperature is 75°C . After entering into temperature setup interface, the value will flash at 1Hz. You can click [UP] to increase the value by 5°C each click or [DOWN] to decrease the value by 5°C .

Click [SET] again to switch to System Limit Temperature setup, the System Temperature value will flash.

Default setting temperature is 55°C . After entering into temperature setup, the temperature value will flash at 1Hz. You can click [UP] to increase the value by 5°C each click or [DOWN] to decrease the value by 5°C .

Decimal point and the number after the point will not show up while setting up.

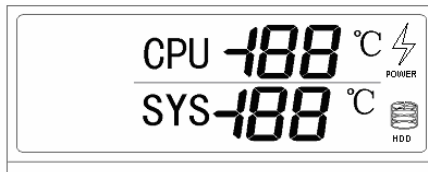
[SET] Exit setup status, display the current CPU and SYSTEM temperature values; it will show "--" when temperature is over limit or sensor error (open, short) occurs.

1.3.4 Giving Alarm When Temperature is Over Limit

When the actual temperature is over limit, buzzer will give alarm for three times and

then stop; while giving alarm, the current temperature value will flash for three times on display at 1Hz and then display the set temperature value for two seconds. The cycle will continue until temperature is below the set temperature and LCD returns to display normal temperature value.

1.3.5 Specification Requirement



* The HDD indicator on LCD will show rotating effect when the HDD is running.

* When CPU is not working normally or an error occurs, you can press the RESET button to reset the CPU.

2. Application Scheme

2.1 Transportation

Well-packaged products are suited for transportation by all kinds of vehicles. During transportation, products should not be put in open cabin or carriage. During transshipping, products should not be stored in open air without protection from the atmospheric conditions. Products should not be transported together with inflammable, explosive and corrosive substances and are not allowed to be exposed to rain, snow and liquid substances and mechanical force.

2.2 Storage

Products should be stored in package box when it is not used. And warehouse temperature should be 0°C ~ 40°C, and relative humidity should be 20% ~ 85%. In the warehouse, there should be no harmful gas, inflammable, explosive products, and corrosive chemical products, and strong mechanical vibration, shock and strong magnetic field interference. The package box should be at least 10cm above ground, and 50cm away from wall, thermal source, window and air inlet.

Caution
Risk of destroying the device!
When shipping the PC in cold weather, please pay attention to the extreme temperature variation. Under this circumstance, please make sure no water drop (condensation) is formed on the surface or interior of the device. If condensation is formed on the device, please wait for over twelve hours before connecting the device.

2.3 Opening the Box and Initial Examination

Opening the Box

Please pay attention to the following issues when opening the box:

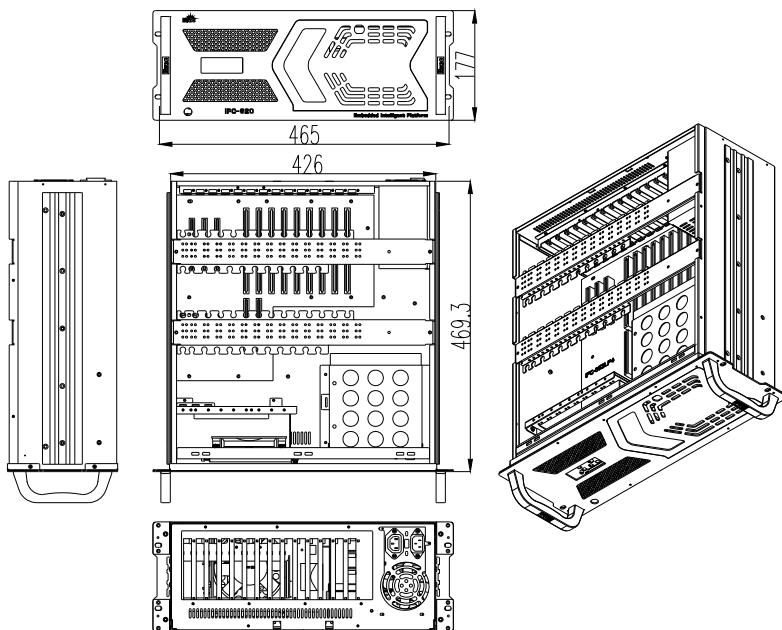
- Do not discard the original packing material. Please keep the original packing material for re-transportation.
- Please keep the documentation at a safe place. The documentation, which is a part of the device, is required for initial device debugging.
- When doing the initial examination, please check whether there are distinct damages to the device caused during the transport.
- Please check whether the delivery contains the intact device and all of the independently ordered accessories. Please contact the customer service when any unconformity or transportation damages occur.

3. Installation Instructions

3.1 Mounting Mode

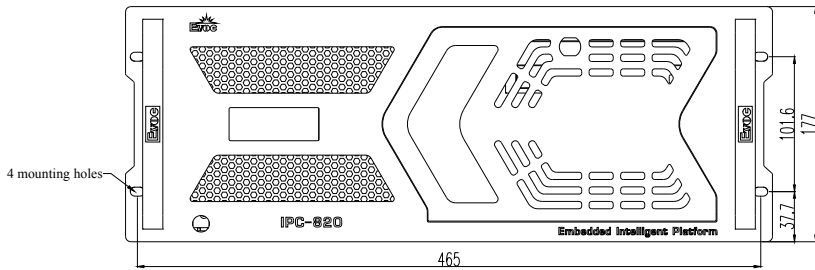
- 19" Rack Mount Desktop Embedded Panel
 Wall Mount VESA Standard Arm Portable
 Others _____

3.2 Outer Appearance and Dimensions



Unit: mm

3.3 Installation Dimensions



Installation method: use M5 or M6 panel screw and M5 or M6 floating nut to mount the product on the standard 19-inch cabinet.

4. Device Connection

4.1 Notices before Connection

Warning

The connected or built-in peripherals with opposite polarities are not allowed.

Warning

The device only operates when connecting with grounded power. No operation is allowed when the device power is ungrounded or only impedance is grounded.

Warning

Rated voltage of the device in use shall be in accord with power feature of the product.

Note:

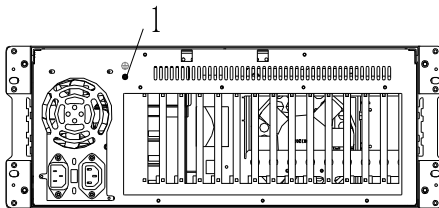
Only the peripheral devices approved for industrial application can be used. When operating the PC, hot swappable IO modules (USB) can be used. The IO devices without hot swap function can only be connected when the PC is powered off.

4.2 Product Grounding

Low impedance ground connection is more helpful to release the interference produced by the external cables, the signal cables or the cables connecting the IO module to the grounding system.

Ground Terminals

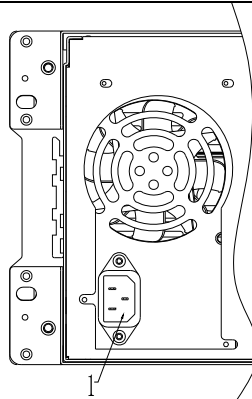
The ground terminal “1” shall be connected with the cabinet installed with the PC or the central grounding busbar on the device. The minimum cross section area of the cable shall be no less than 5mm^2 , and the grounding resistance shall be no more than 0.1Ω .



4.3 Connecting the Device to Power

Steps to connect the device to power:

Connect the power cable to the connector “1”, and press the power switch button on the front panel to boot up the device.



 **Danger**

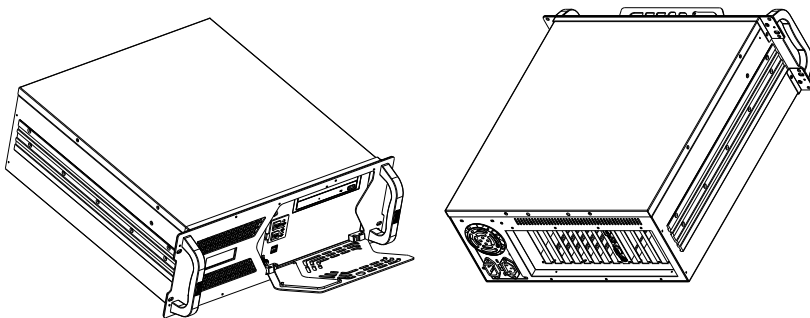
Disconnect the power source and data cable during a lightning storm.

Attention

The PC is completely isolated from the power supply only by disconnecting the power connector.

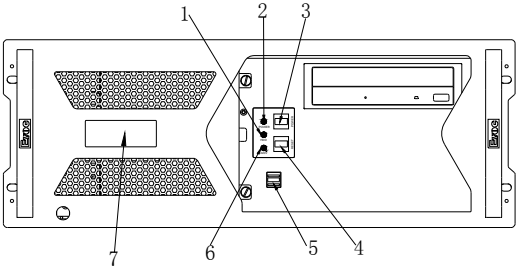
5. Operating Instructions

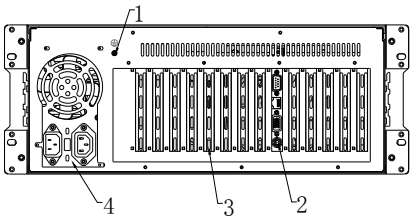
5.1 Outer Appearance

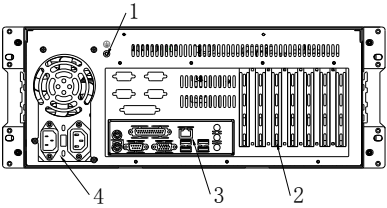


5.2 External Structure

The front view of the PC when KB-LK is supported by the motherboard	Item	Description
	①	Reset button
	②	Power switch
	③	Power indicator
	④	HDD indicator
	⑤	KB-LK indicator
	⑥	USB port
	⑦	KB-LK switch
	⑧	Temperature display screen
	⑨	Keyboard port

<p>The front view of the PC when KB-LK is not supported by the motherboard</p>	<p>Item</p>	<p>Description</p>
	<p>①</p>	<p>Power switch</p>
	<p>②</p>	<p>Power</p>
	<p>③</p>	<p>HDD indicator</p>
	<p>④</p>	<p>220V indicator</p>
	<p>⑤</p>	<p>USB port</p>
	<p>⑥</p>	<p>Reset button</p>
	<p>⑦</p>	<p>Temperature display screen</p>

<p>Rear view of the PC with IPC/EPI/EPE motherboard</p>	<p>Item</p>	<p>Description</p>
	<p>①</p>	<p>Grounding</p>
	<p>②</p>	<p>Motherboard connector</p>
	<p>③</p>	<p>Expansion card slot</p>
	<p>④</p>	<p>Power supply</p>

Rear view of the PC with ATX motherboard	Item	Description
	①	Grounding
	②	Expansion card slot
	③	Motherboard connector
	④	Power supply

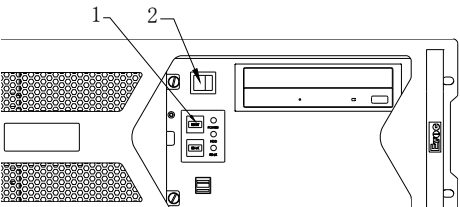
5.3 Operation Control

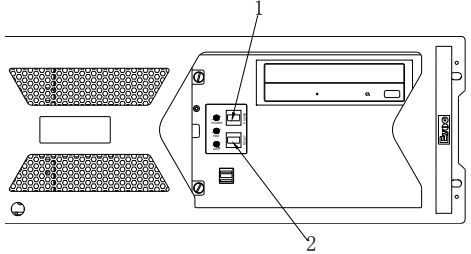
Warning

The On/Off button signal will not disconnect PC power supply!

Caution

When the PC executes hardware reset, data may be lost.

The motherboard supports KB-LK function control button	Item	Description
	①	Reset button Pressing the reset button will trigger hardware reset.
	②	Power switch button The On/Off button used to turn on or shut down the PC.

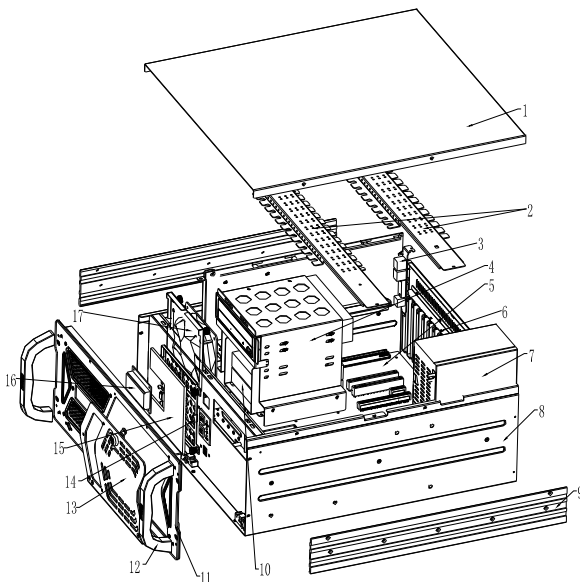
The motherboard does not support KB-LK function control button		Item	Description
	①	<p>Power switch button</p> <p>The On/Off button used to turn on or shut down the PC.</p>	
	②	<p>Reset button</p> <p>Pressing the reset button will trigger hardware reset.</p>	

5.4 Status Indicators

Display	Meaning	LED	Description
POWER	Display PC status	Off	PC is not operating
		Green	PC is operating
HDD	Display HDD access	Off	No access
		Red	Being accessed
220V	AC power indicator	Off	AC 220V disconnected
		Yellow	AC 220V connected

6. Assembly and Maintenance

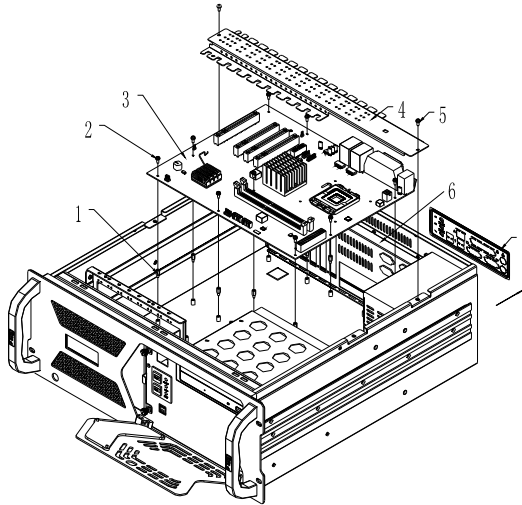
6.1 Overall Assembly Drawing



Item	Description	Item	Description	Item	Description
1	Chassis cover	2	Binding strip	3	Motherboard
4	Optical drive module	5	Carrier board	6	IO bracket
7	Power supply	8	Welded part of the chassis	9	Guide rail
10	HDD module	11	Front panel assembly	12	Handle
13	Door	14	Dust filter bracket	15	Dustproof sponge
16	Temperature module	17	Fan module		

6.2 Installation and Removal of Motherboard

6.2.1 Installation and Removal of ATX Motherboard



Item	Description	Item	Description	Item	Description
1	Copper hexagon screw (as the case may require)	2	M3*8 screws with washers (as the case may require)	3	Motherboard
4	Binding strip	5	Cup head M4*6 screws with external teeth lock washers	6	IO bracket
7	IO plate				

Installing ATX motherboard:

1. Buckle the IO plate of the motherboard on the IO bracket from inside of the chassis toward outside (Please pay attention to the direction: it must correspond to the

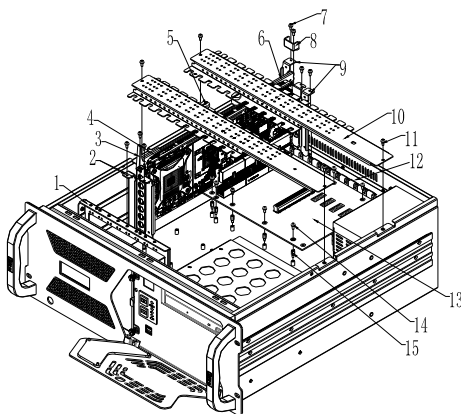
IO port of the motherboard);

2. According to the number of mounting holes of the motherboard, use same number of copper hexagon screws CH-M3-8-5-Ni and lock them on the self-clinching bolts of the chassis;
3. Place the motherboard to be installed on the copper bolts, gently align the position of IO port and mounting holes, and use proper number of M3*8 screws with washers to fasten the motherboard;
4. Put the binding strip on the installation position of the chassis, and use cup head M4*6 screws with external teeth lock washers to fasten it.

Removing ATX motherboard:

1. Loosen the countersunk head screws on the chassis cover, then remove the cover;
2. Loosen the cup head M4*6 screws with external teeth lock washers to remove the binding strip;
3. Loosen the M3*8 screws with washers fixing the motherboard, then the motherboard can be taken out from the chassis.

6.2.2 Installation and Removal of EPE Motherboard



Item	Description	Item	Description	Item	Description
1	Clip bar bracket	2	Guide rail bar	3	Motherboard puller
4	Motherboard	5	2X rubber spring pad	6	Motherboard puller
7	7X M3*6 screw	8	Puller bracket	9	Guide rail bar
10	Binding strip	11	4X cup head M4*6 screws with external teeth lock washers	12	IO bracket
13	Carrier board	14	M3*8 screws with washers (as the case may require)	15	Copper hexagon screw (as the case may require)

Installing EPE motherboard:

1. According to the number of mounting holes of the carrier board, use same number of copper hexagon screws CH-M3-8-5-Ni and lock them on the corresponding self-clinching bolts of the chassis;
2. Place the carrier board to be installed on the copper bolts, align the position of holes, and use proper number of M3*8 screws with washers to fasten the carrier board;
3. According to the slot position of the carrier board, use M3X6 screws to install the four guide rail bars and puller bracket respectively on the IO bracket and clip bar bracket corresponding to the left/right slots of the motherboard, as shown in the above figure;
4. By the corresponding slot and along the guide rail bars, gently insert the motherboard on the carrier board, use two M3X6 screws to fasten the bracket of the motherboard and CPU backplane bracket respectively onto the IO bracket and clip bar

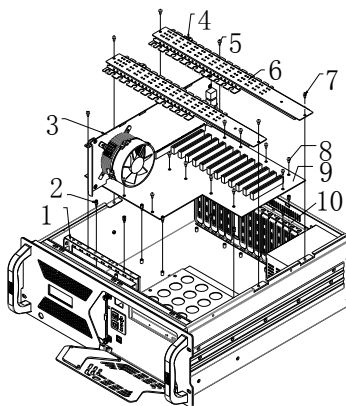
bracket;

5. Install the rubber spring pad on the corresponding binding strip. Please be aware that slot direction of the rubber spring pad must be consistent with the direction of PCB board of the motherboard;
6. Put the two binding strips with rubber spring pad on the installation position of the chassis, make the slot of the rubber spring pad click onto the PCB board of the motherboard, finally use four cup head M4*6 screws with external teeth lock washers to fasten them.

Removing EPE motherboard

1. Loosen the countersunk head screws on the chassis cover, the remove the cover;
2. Loosen the four cup head M4*6 screws with external teeth lock washers fixing the two binding strips, and remove them;
3. Loosen the two M3*6 screws fixing the motherboard, use two hands to push away the two motherboard puller, then you can gently pull out the motherboard from the carrier board along the guide rail bar.

6.2.3 Installation and Removal of FSC(EPI) Motherboard



Item	Description	Item	Description	Item	Description
1	Clip bar bracket	2	Copper hexagon screw (as the case may require)	3	Motherboard
4	2X rubber spring pad	5	2X truss head M3*6	6	Binding strip
7	4X cup head M4*6 screws with external teeth lock washers	8	M3*8 screws with washer (as the case may require)	9	Carrier board
10	IO bracket				

Installing FSC(EPI) motherboards:

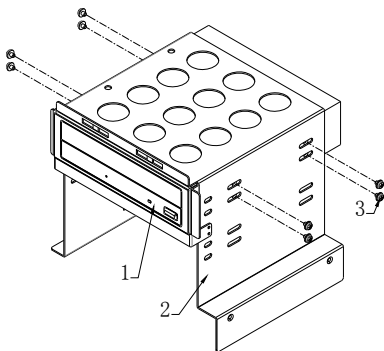
1. According to the number of mounting holes of the carrier board, use same number of copper hexagon screws CH-M3-8-5-Ni (for EPI carrier board, it is copper hexagon screws CH-M3-7.5-5-N) and lock them in the chassis;
2. Use proper number of M3*8 screws with washers to fasten the carrier board;
3. By the corresponding slot, insert the motherboard on the carrier board, use two M3X6 screws to fasten the bracket of the motherboard and CPU backplane bracket respectively onto the IO bracket and clip bar bracket;;
4. Install the rubber spring pad on the corresponding binding strip. Please be aware that slot direction of the rubber spring pad must be consistent with the direction of PCB board of the motherboard;
5. Put the two binding strips with rubber spring pad on the installation position of the chassis, make the slot of the rubber spring pad click onto the PCB board of the motherboard, finally use four cup head M4*6 screws with external teeth lock washers to fasten them.

Removing FSC(EPI) motherboards:

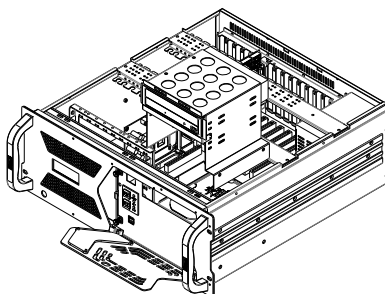
1. Loosen the countersunk head screws on the chassis cover, then remove the cover;
2. Loosen the four cup head M4*6 screws with external teeth lock washers fixing the two binding strips, and remove them;
3. Loosen the two M3*6 screws fixing the motherboard, then you can pull out the motherboard from the carrier board.

6.3 Installation and Removal of Drives

6.3.1 Installation and Removal of Optical Drive



(Figure 1)

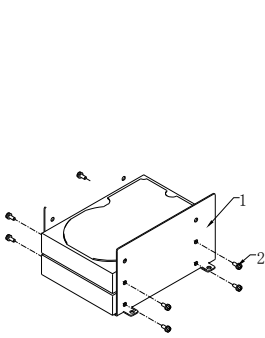


(Figure 2)

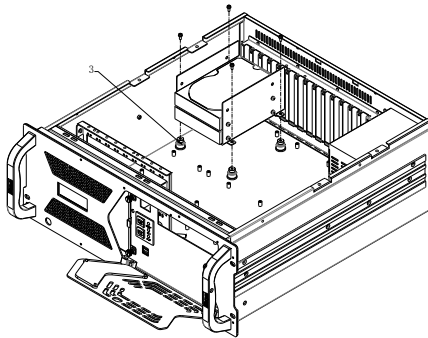
Item	Description	Item	Description	Item	Description
1	Optical drive	2	Butt-weld assembly of optical drive	3	Screw X6

This chassis can be configured with one optical drive. Use 8PCS M3×6 pan head screws to fasten the optical drive on the butt-weld assembly (Figure 1), then fix them in the chassis (Figure 2).

6.3.2 Installation and Removal of Hard Drive



(Figure 1)

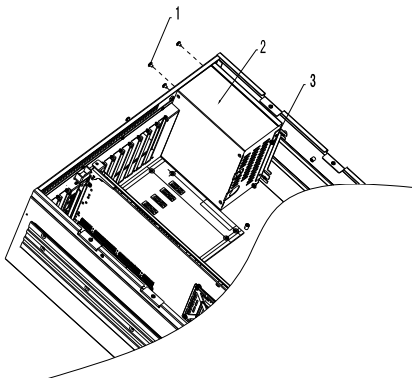


(Figure 2)

Item	Description	Item	Description	Item	Description
1	Hard drive bracket	2	Screw	3	Shock absorber

The chassis is configured with a 3.5-inch hard drive. The hard drive module is composed of a HDD bracket and 4PCS shock absorbers. Fasten the 1PCS hard drive by four hex head #6-32×1/4 BS screws, then use 4PCS cup head M4×6 screws to fasten the HDD assembly in the chassis.

6.4 Installation and Removal of Power Supply



Item	Description	Item	Description	Item	Description
1	BS screw MHW#6-32×1/4	2	Power supply	3	M3 truss head screw

Installing the Power:

Place the power supply in the right position of the chassis, use four BS screws to fasten the end of the power supply, finally use two M3 screws to fasten the power supply mounting bracket onto the chassis.

Removing the Power:

Open the chassis cover, loosen the two M3 screws fixing the power supply mounting bracket, loosen the four BS screws which fasten the end of the power supply, then you can take out the power supply from the chassis.

6.5 Installation and Removal of the Fan

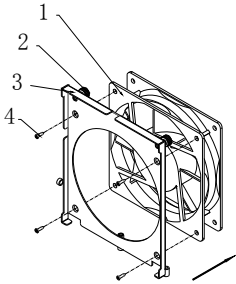


Figure 1

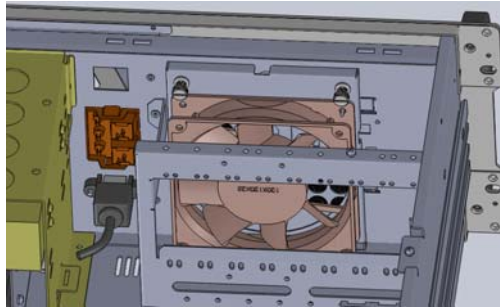


Figure 2

Item	Description	Item	Description	Item	Description
1	Fan	2	Manual screw	3	Fan bracket
4	Countersunk head self-tapping screw ST4.8*10				

Installing the fan:

1. As shown in Figure 1, use four self-tapping screws to fix the fan onto the fan bracket (please pay attention to the direction);
2. Install the assembled fan module in the chassis (as per Figure 2), and tighten the manual screw.

Removing the fan

1. Open the chassis cover, loosen the manual screw and take the fan module out of the chassis;
2. Use a tool to loosen the four self-tapping screws, and separate the fan from the bracket.

6.6 Installation, Removal and Maintenance of the Dust Filter

6.6.1 Installing the Dust Filter

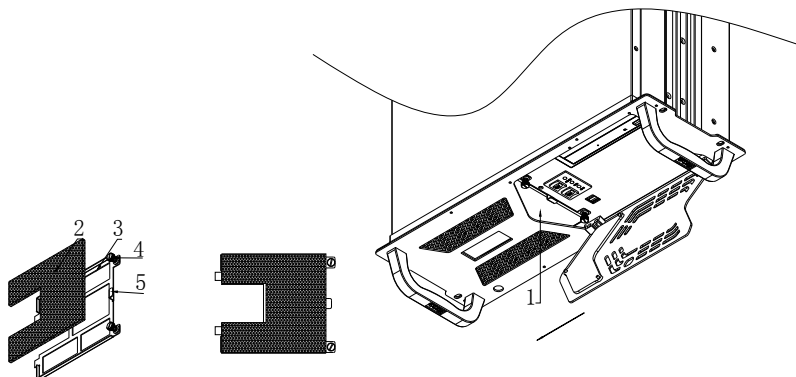


Figure 1

Figure 2

Figure 3

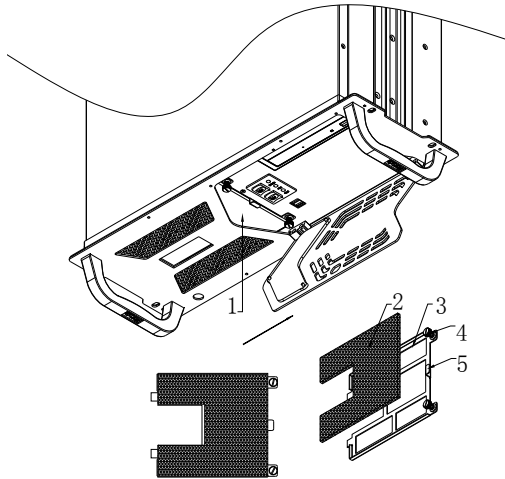
Item	Description	Item	Description	Item	Description
1	Dust filter	2	Dust filter	3	Dust filter bracket
4	Manual screw	5	Dust filter bracket handle		

1. Place the dust filter on the bracket according to the Figure 1 and Figure 2, and open the door with the key;
2. Fasten the two screws fixing the dust filter bracket. Hold the dust filter bracket by the handle and insert the bracket with dust filter from right to left by the direction of arrow, then tighten the manual screws (Figure 3).

Attention

To ensure excellent heat dissipation and ventilation of the system, the dust filter must be cleaned regularly so that it will not be clogged with dust. It is recommended to clean the dust filter at least once every three months, or even more frequently for dusty environment. The dust filter should be replaced every year.

6.6.2 Removing the Dust Filter



Item	Description	Item	Description	Item	Description
1	Dust filter	2	Dust filter	3	Dust filter
4	Manual screw	5	Dust filter bracket handle		

Use key to open the door, loosen the manual screw on the bracket, hold the dust filter bracket handle and gently pull out the dust filter from the left (by the direction of arrow).

7. Installing the Drivers

Regarding the installation of the driver program and the detailed information of the motherboard, please refer to the enclosed CD of the PC.

8. Appendix

8.1 Troubleshooting and Solutions

Common Malfunctions	Reasons	Troubleshooting and Solution
The device is not operating	No power supply	Please check the power supply and the power cable/connector.
	Improper device operating environment	<ol style="list-style-type: none"> 1. Check with the environment conditions; 2. Please wait for twelve hours before powering on the device shipped in cold weather.
The external display is black	The display has not been turned on	Turn on the display
	The display is under “power saving” mode	Press any key on the keyboard.
	The luminance control is set to “Black”.	Increase the screen luminance by luminance control. Please refer to the instructions of the display for detailed information.
	Power cable or display cable is not connected	<ol style="list-style-type: none"> 1. Please check whether the power cable is correctly connected with the display, the system unit or the ground port. 2. Please check whether the display cable is correctly connected with the display and the system unit. 3. Contact Technique Support if the screen remains black after implementing the above measures.
Incorrect time or date on PC	Incorrect BIOS setting	Follow the power-on prompt and press the key to enter the BIOS Setup; adjust the time and date in BIOS Setup.

BIOS setting is correct while the time and date are incorrect.	Insufficient backup battery capacity	Replace the battery
USB device has no response	USB port is disabled in BIOS	Use other USB ports or enable that port.
	USB 2.0 device is connected; however, USB 2.0 is disabled.	Enable USB 2.0.
	USB port is not supported by the operating system.	<ol style="list-style-type: none"> 1. Enable USB Legacy Support for the mouse and keyboard (Legacy USB is supported); 2. For other devices, appropriate USB drivers are required.
The computer is not booted or displays “Boot device not found”	In booting priority of the BIOS setting, the device is not the first priority or the device is not included in the booting device.	Modify the booting priority of the device in the Boot menu of BIOS setting or include that device into the boot priority.
No system disk can be found when powering on	The HDD power cable or data cable is not connected well.	Check whether the power cable and the data cable of the hard disk (the hard disk shall be installed with operating system and is bootable) are well connected.
	System files on the hard disk are damaged.	Enter the system (usually WinPE system) with a bootable disk; check whether the system in the hard disk is damaged. Reinstall the system if necessary.

<p>Plug and play I/O card, no IO card is detected or no IO card can be used when used again.</p>	<p>Poor contact of the slot.</p>	<p>Poor contact is usually caused by frequent installation/uninstallation of the PCI or ISA card, unstable fixing or improper dust-proof measures; please remove and install the card for a few times or use another slot.</p>
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