



## **–48 Volt Power Supply Information**





## **–48 Volt Power Supply Information**

#### Important

Before using this information and the product it supports, read the general information in "Special Notices" on page v.

### First Edition (February 1998)

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## **Required Electronic Emission and Connectivity Notices**

### **Class A Federal Communications Commission Statement**

The following statement applies to this IBM product. The statement for other IBM products intended for use with this product will appear in their accompanying manuals.

### **Federal Communications Commission (FCC) Statement**

**Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

IBM is not responsible for any radio or television interference caused by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.



## Germany

### IBM Industriecomputer

#### ***Was müssen Sie beim Anschluß des Industriecomputers an einen Modem der DBP Telekom beachten?***

- Das ***Zulassungszeichen*** der Deutschen Bundespost (DBP).

Bringen Sie das beiliegende Schildchen mit der DBP Zulassungsnummer bitte auf der Rückseite des Industriecomputers (IC) an.

- Die ***Allgemeine Anschalterlaubnis***.

Dieser IC erfüllt die Bedingungen der Absätze 2.1 bis 2.4 der BMPT Verfügung 163/1991 für die ***Allgemeine Anschalterlaubnis*** (AAE). Siehe beiliegenden Auszug aus Amtsblatt BMPT 51/91.

Bitte beachten Sie die übrigen Bestimmungen des Abschnittes 2, Verfügung 163/1991 des Bundesministeriums für Post und Telekommunikation (BMPT). Rückfragen dazu richten Sie an das BMPT.

Gegebenenfalls ist nach Abschnitt 3 der beiliegenden BMPT Verfügung 162/1991 zu verfahren.

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## Handling Static-Sensitive Devices

### ***Attention***

Static electricity can seriously damage computer components or options. When you handle options and other computer components, take the following precautions to avoid static electricity damage:

- When you are installing a new option, do not open the static-protective package containing the option until you are ready to actually install it.
- Before handling electronic components, touch a grounded metal surface to discharge any static buildup in your body.
- Limit your movement. Movement can cause static electricity to build up around you.
- Always handle components carefully. Handle adapters and memory-module kits by the edges. Never touch any exposed circuitry.
- Prevent others from touching components.
- When you are installing a new option, touch the static-protective package containing the option to an unpainted metal surface on the computer for at least two seconds. (This reduces static electricity from the package and from your body.)
- When possible, remove the option and install it directly into the computer without setting the option down. When this is not possible, place the static-protective package that the option came in on a smooth level surface and place the option on it.
- Do not place the option on the computer cover or other metal surface.

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## Safety

### Electrical Safety

#### **CAUTION:**

**Electrical current from power, telephone, and communication cables can be hazardous. To avoid any shock hazard, you should disconnect all power cords and cables as described in the following information.**

For your safety, always do the following *before* removing the cover:

1. Turn off the computer and any attached devices, such as printers, displays, and external drives.

**Note:** Industrial computer users in the United Kingdom who have a modem or fax machine attached to your computer must disconnect the telephone line from the computer *before* unplugging any power cords (also known as power cables). When reassembling the computer, reconnect the telephone line *after* plugging in the power cords.

2. Unplug all the power cords from electrical outlets.
3. Disconnect all communication cables from external receptacles.
4. Disconnect all cables and power cords from the back of the computer.

**Note:** Do not reconnect any cables or power cords until you reassemble the computer and put the cover back on.

#### **CAUTION:**

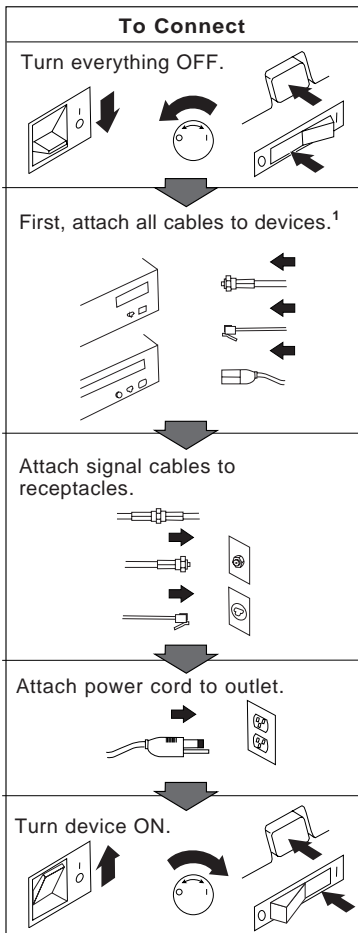
**Never remove the cover on the power supply. If you have a problem with the power supply, have your computer serviced.**

#### **CAUTION:**

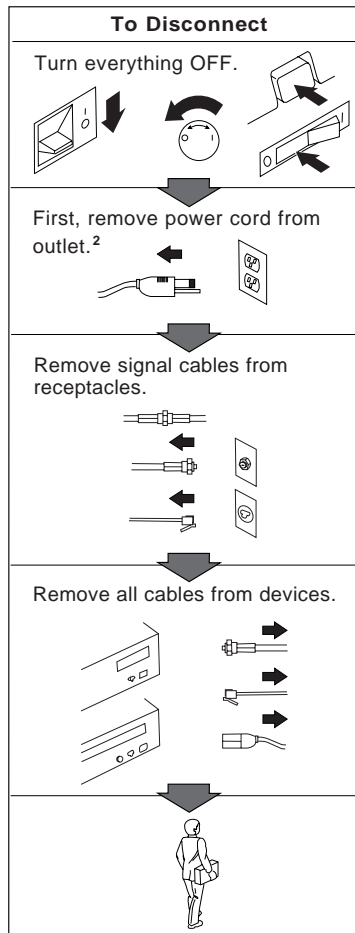
**The computer with options can weigh as much as 17 kilograms (37.8 pounds). Do not attempt to lift it by yourself if you think it is too heavy for you.**

**DANGER:**

Electrical current from power, telephone, and communication cables is hazardous. To avoid shock hazard, connect and disconnect cables as shown below when installing, moving or opening the covers of this product or attached devices. The power cord must be used with a properly grounded outlet.



<sup>1</sup> In the U.K., by law, the telephone cable must be connected after the power cord.



<sup>2</sup> In the U.K., by law, the power cord must be disconnected after the telephone line cable.

## Hinweise ACHTUNG

Elektrische Sicherheit

### **VORSICHT:**

**An Netz-, Telefon- oder Datenleitungen können gefährliche elektrische Spannungen anliegen. Zur Vermeidung von elektrischen Schlägen sollten alle Netzkabel und sonstige Kabel wie unten beschrieben gelöst werden.**

Aus Sicherheitsgründen *vor* dem Entfernen der Abdeckungen folgende Schritte ausführen:

1. Den Computer und alle angeschlossenen Einheiten wie Drucker, Datensichtgeräte und externe Laufwerke ausschalten.
2. Alle Netzkabel von den Steckdosen abziehen.
3. Alle Übertragungskabel von den Steckdosen abziehen.
4. Alle Netzkabel und sonstige Kabel von der Rückseite des Computers lösen.

**Anmerkung:** Netzkabel und sonstige Kabel erst wieder anschließen, nachdem der Computer wieder aufgestellt und die Abdeckung angebracht wurde.

### **VORSICHT:**

**Die Abdeckung des Netzteils darf nicht entfernt werden. Bei Problemen mit dem Netzteil den Computer vom Fachmann überprüfen lassen.**

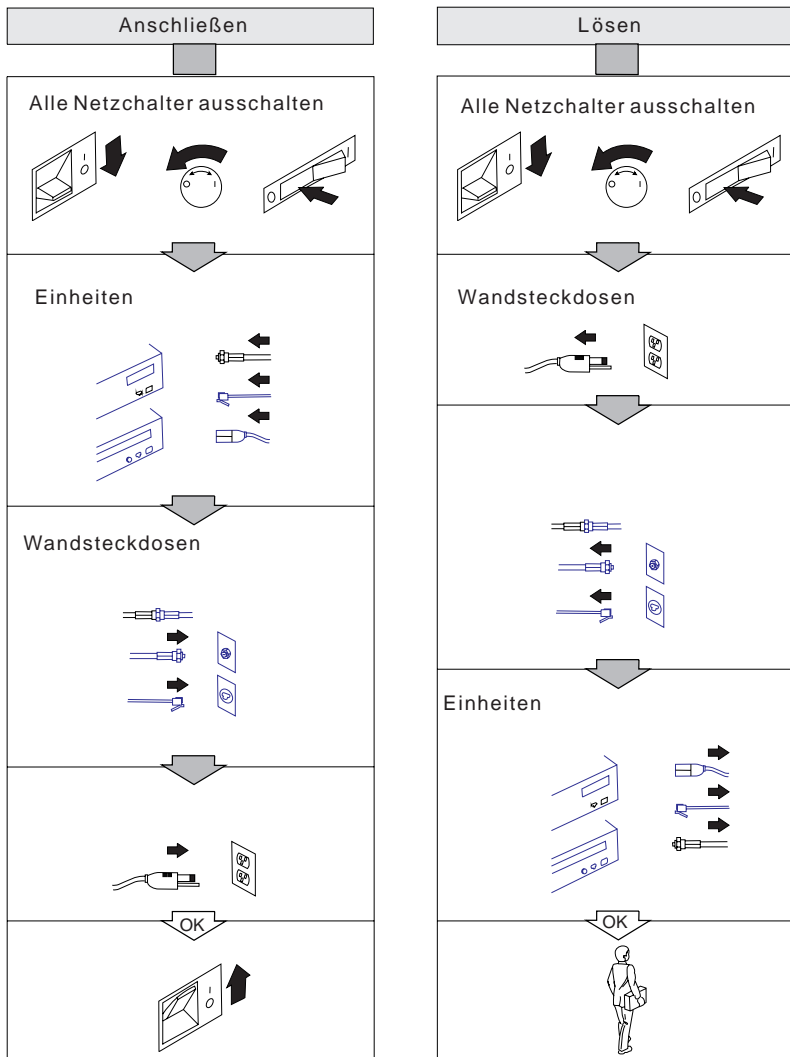
### **VORSICHT:**

**Die Systemeinheit kann, einschließlich der Systemerweiterungen, bis zu 17 kg wiegen. Nicht alleine anheben.**



## GEFAHR

Der Benutzer sollte beim Installieren der Systemeinheit oder weiterer Einheiten die Kabel in der unten dargestellten Reihenfolge anschließen bzw. lösen.  
Bei Gewitter sollten die Kabel weder angeschlossen noch gelöst werden.



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## **–48 Volt DC Power Supply**

The IBM –48 Volt DC Power Supply (hereinafter referred to as the *power supply*) is a DC voltage source that can be mounted in the system unit of the following computers:

- IBM 7586 Industrial Computer
- IBM 7588 Industrial Computer

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### **Specifications**

The power supply functions with a DC input voltage within the following range:

<b>Absolute Minimum Voltage</b>	<b>Absolute Maximum Voltage</b>	<b>Nominal Voltages</b>	<b>Maximum Input Current</b>
–36 V dc	–72 V dc	–48, –60 V dc	8, 6.4 Amps

The loading of the adapters and hard disk drives installed in the system unit must not exceed:

<b>Nominal Output Voltage</b>	<b>Load Current ±48 V Input</b>	<b>Load Current ±60 V Input</b>
+ 5 V dc	1.5 Amps to 20.0 Amps	1.5 Amps to 40.0 Amps
+ 12 V dc	0.0 Amps to 3.0 Amps	0.0 Amps to 8.0 Amps
– 12 V dc	0.0 Amps to 1.0 Amps	0 Amps to 1.0 Amps
– 5.0 V dc	0.0 Amps to 0.5 Amps	0 Amps to 0.5 Amps
+ 3.52 V dc	0 Amps; 0.5 Amps to 15.0 Amps	0 Amps; 0.5 Amps to 40.0 Amps

#### **Notes:**

1. + 5 V dc and + 3.52 V dc cannot exceed 200 watts combined.
2. All outputs cannot exceed 250 watts combined.

## Heat Output

The following is an approximate maximum heat output in British Thermal Units (BTUs) per hour:

250 Watt power supply — 350 Watt/1200 BTU per hour

## Environment

The following is the operating conditions best suited for the power supply:

### ***Ambient air temperature***

Operating:	0° to 45°C (32° to 113°F)
Non-operating:	0° to 60°C (32° to 140°F)
Shipping:	–40° to 60°C (–40° to 150°F)

### ***Relative humidity***

Operating:	5% to 95%
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### ***Shock***

Operating:	30 G, 1/2 sine wave for 3 milliseconds duration
	15 G, 1/2 sine wave for 10 milliseconds duration

### ***Vibration***

5 to 500 Hz random at 0.67 G RMS

### ***IEC standard compliance***

Refer to the documentation that came with the computer.



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## Installing the Power Supply

This section provides instructions on installing the –48 volt power supply in the system unit of your IBM industrial computer.

To install the power supply on the system unit:

1. Remove the existing power supply. Refer to the documentation that came with the computer.
2. Install the –48 volt power supply. Refer to the documentation that came with the computer.

The following table shows the allowable power connections to the terminal block on the –48 volt power supply.

Terminal Block Label	Option A	Option B	Option C	Option D
–48 Volt	–48 Volt	–60 Volt	0 Volt	0 Volt
0 Volt	0 Volt	0 Volt	+48 Volt	+60 Volt
GND	Earth Ground	Earth Ground	Earth Ground	Earth Ground

### Attention!

Connect to a reliably grounded 48/60 V dc SELV source.

The branch circuit over current protection must be rated 48/60 V dc/10A.

Use 18 AWG/.82mm<sup>2</sup> solid copper conductors or 18 AWG/1.1mm<sup>2</sup> stranded copper conductors for connection to the branch circuit.

A readily accessible disconnect device that is suitably approved and rated 48/60 V dc/10A shall be incorporated in the field wiring.

### Achtung!

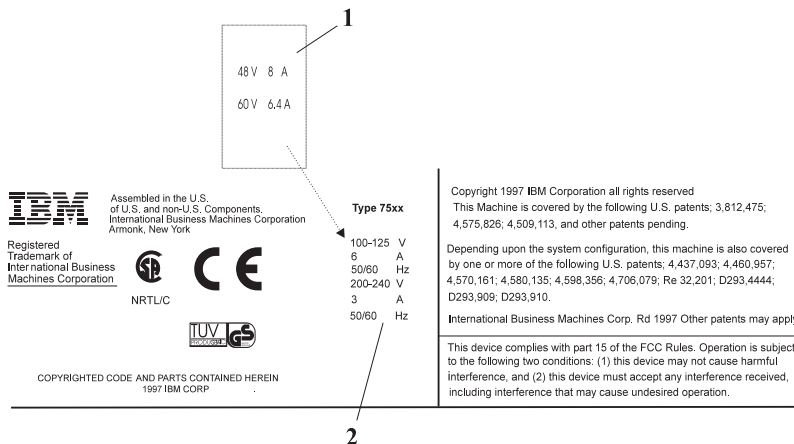
Schließen Sie das Netzteil nur an eine Sicherheits-Kleinspannung 48/60 V = (Gleichstrom) an, die gut geerdet ist.

Der Stromkreis muß mit einer 10 A Sicherung bei 48/60 V = (Gleichstrom) abgesichert werden.

Benutzen Sie mindestens 18 AWG/1.02 mm<sup>2</sup> massiven Kupferleiter oder 18 AWG/1.2 mm<sup>2</sup> Kupfer-Litze für den Stromanschluß.

Eine leicht zugängliche Abschaltvorrichtung, die dem 10 A/48/60 V = (Gleichstrom) entspricht, muß eingebaut werden.

3. Place the –48 volt power supply “Voltage/Current Rating” label (1) over the existing voltage/current rating label (2) as shown. Make sure the surface is clean; otherwise, the new label will not stick to the surface.



Typically, a voltage/current rating label is located on the bottom of the system unit.

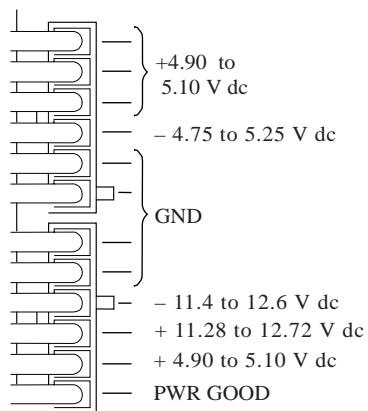
4. Complete the form at the back of this document and return it to IBM.

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## Troubleshooting

If the power-on indicator is not on or if the power-supply fan is not running, check the power cord for proper installation and continuity.

If this setting is correct, check the power supply connector voltages as shown.



Rear

The power supply connector is located at the right rear of the system board.

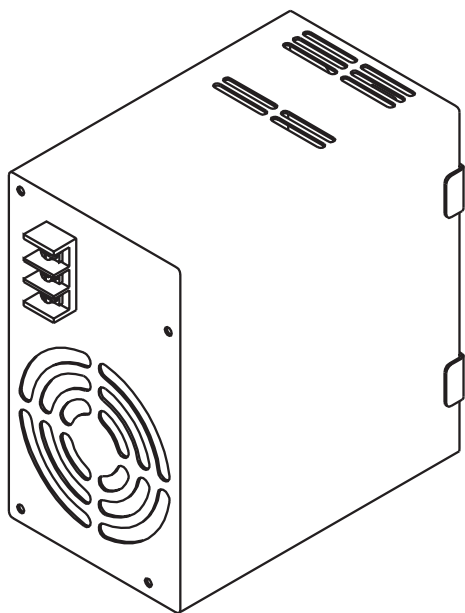
These voltages must be checked with the power supply cables connected to the system board. If the voltages are not correct:

- Check the power cord for continuity.
- Check the on/off switch for continuity.
- Replace the power supply.

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**IBM Part Number**

The following illustrates the -48 volt DC power supply.



The power supply must be ordered by its IBM part number as follows:

IBM Part Number	Description
76H0672	-48 volt power supply, 250 Watt



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## **Sending Your Comments to IBM**

–48 Volt Power Supply  
Information

Part Number 02K3653

If you especially like or dislike anything about this book, please use one of the methods listed below to send your comments to IBM. Whichever method you choose, make sure you send your name, address, and telephone number if you would like a reply.

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Make sure to include the following in your note:

- Title and publication number of this book
- Page number or topic to which your comment applies.

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## Machine Update Information

**-48 Volt Power Supply  
Information**

**Part Number 02K3653**

Please provide the following information as soon as possible.

Machine \_\_\_\_\_ (serial number)

has been updated with the -48 volt power supply.

To return this form:

Mail by following the directions shown on the reverse.

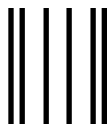
Fax to (561) 443-6003.

\_\_\_\_\_  
Name

\_\_\_\_\_  
Address

\_\_\_\_\_  
Company or Organization

\_\_\_\_\_  
Phone No.



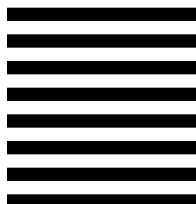
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**Machine Update Information**









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