

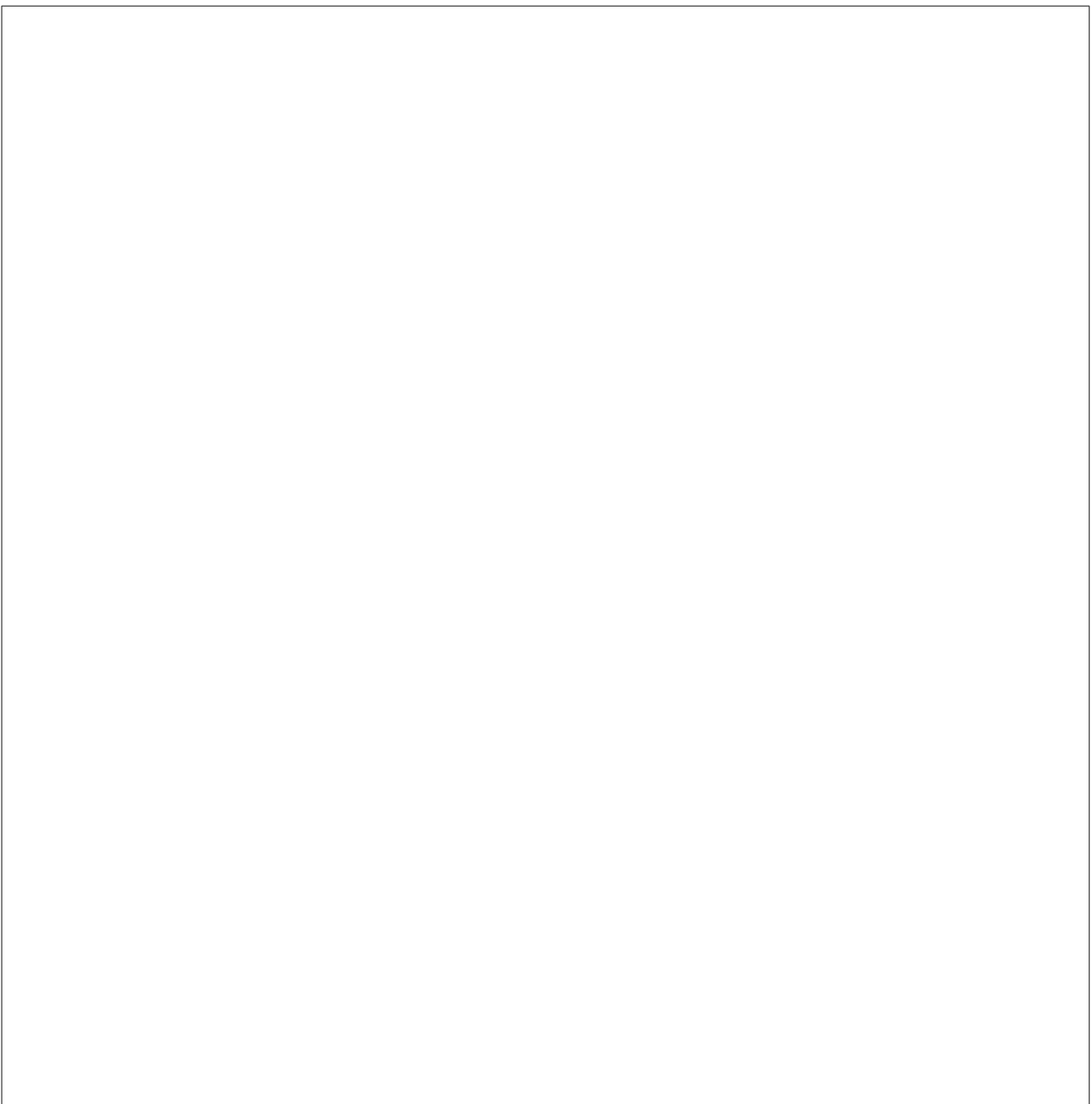
# SIEMENS

## SIMATIC

Box PC 820  
PC FI45 V2

Operating Instructions

A5E00051535-04



## Safety Guidelines

This product information bulletin contains notices which you should observe to ensure your own personal safety, as well as to protect the product and connected equipment. These notices are highlighted in the manual by a warning triangle and are marked as follows according to the level of danger:



### Warning

indicates that death, severe personal injury or substantial property damage can result if proper precautions are not taken.



### Caution

indicates that minor personal injury or property damage can result if proper precautions are not taken.

### Note

draws your attention to particularly important information on the product, handling the product, or to a particular part of the documentation.

## Correct Usage

Please observe the following

### Note

You can set up and operate your device in conjunction with the following instructions.

Only **qualified personnel** should be allowed to install and work on this equipment. Qualified persons are defined as persons who are authorized to commission, to ground, and to tag equipment, systems, and circuits in accordance with established safety practices and standards.



### Warning

This device may only be used for the applications described in the catalog or technical description, and only in connection with devices or components from other manufacturers which have been approved or recommended by Siemens.

This product can only function correctly and safely if it is transported, stored and set up carefully and correctly, and operated and maintained as recommended.

## Trademarks

SIMATIC® , SIMATIC NET® and SIMATIC HMI® are registered trademarks of Siemens AG.

(A )

가

### Copyright © Siemens AG 2000 All Rights Reserved

The reproduction, transmission or use of this document or its contents is not permitted without express written authority. Offenders will be liable for damages. All rights, including rights created by patent grant or registration of a utility model or design, are reserved.

### Disclaimer of Liability

We have checked the contents of this manual for agreement with the hardware and software described. Since deviations cannot be precluded entirely, we cannot guarantee full agreement. However, the data in this manual are reviewed regularly and any necessary corrections included in subsequent editions. Suggestions for improvement are welcomed.

Siemens AG  
Bereich Automatisierungs- und Antriebstechnik  
Geschaeftsgebiet Industrie Automatisierungssysteme  
Postfach 4848, D-90327 Nuernberg

Siemens Aktiengesellschaft

Technical data subject to change.

A5E00051535  
Printed in the Fed. Rep. of Germany



# Contents

	<b>Welcome to your SIMATIC PC</b> .....	<b>v</b>
	Overview .....	v
	Information about this manual .....	viii
	Conventions .....	viii
<b>1</b>	<b>Important Notes</b> .....	<b>1-1</b>
1.1	General Notes .....	1-1
1.2	Notes on the CE Symbol .....	1-5
1.3	Approvals for the USA, Canada and Australia .....	1-6
<b>2</b>	<b>Unpacking and Installing</b> .....	<b>2-1</b>
2.1	Device Models .....	2-2
2.2	Installing and Transporting .....	2-4
2.3	Hardware Components .....	2-5
2.4	Installation .....	2-8
2.5	Drives .....	2-12
<b>3</b>	<b>Setting Up and Operating</b> .....	<b>3-1</b>
3.1	Connecting the SIMATIC PC to the Power Supply .....	3-2
3.2	Connecting I/O Devices .....	3-4
3.3	Operating Elements and Displays .....	3-9
3.3.1	Input Fields on the FI45 .....	3-10
3.3.2	Floppy Disk Drive .....	3-14
3.3.3	Reset Key .....	3-14
3.3.4	CD-ROM Drive .....	3-15
3.3.5	Display .....	3-16
3.3.6	LEDs .....	3-17
3.4	Starting Up Your PC for the First Time .....	3-18
3.5	Setting Up Your PC .....	3-18
3.6	Electronic Manual .....	3-19
3.7	Protective Functions .....	3-20

<b>4</b>	<b>Expanding</b> .....	<b>4-1</b>
4.1	Opening the Unit .....	4-2
4.2	Installing Memory Expansion Cards .....	4-4
4.3	Changing the Backup Battery .....	4-6
4.4	Closing the Unit .....	4-7
4.5	Options .....	4-7
4.6	Reinstallation of Software .....	4-8
4.6.1	Installation from the Recovery CD for Microsoft Windows NT .....	4-8
4.6.2	Installation of the operating system MS-DOS 6.22 .....	4-9
4.6.3	Installation from the Recovery CD for Microsoft Windows 98 .....	4-9
4.6.4	Installation from the Recovery CD for Microsoft Windows 2000 .....	4-11
4.6.5	Setting the Language Selection for Windows 2000 .....	4-12
4.6.6	Installation of Drivers and Software .....	4-12
4.7	Direct Key Module .....	4-12
4.8	Touch Screen Display .....	4-12
<b>5</b>	<b>Technical Specifications</b> .....	<b>5-1</b>
5.1	Technical Specifications .....	5-2
<b>6</b>	<b>Error Diagnostics</b> .....	<b>6-1</b>
6.1	The PC Does not React .....	6-2
6.2	Problems When Using Modules from Other Manufacturers .....	6-2
6.3	The Monitor Remains Dark .....	6-3
6.4	The Screen Display Does not Appear or Drifts .....	6-4
6.5	No Mouse Pointer Appears on the Screen .....	6-4
6.6	The Clock Time and/or the Date in Your PC Is Incorrect .....	6-5
6.7	Rebooting Your Hard Drive (Data Deleted) .....	6-5
6.8	USB-Device doesn't function .....	6-5
6.9	An Error Message Appears on the Screen .....	6-6
6.10	Self-Test Prior to Booting .....	6-7
<b>7</b>	<b>Hotline Services</b> .....	<b>7-1</b>
7.1	Customer Support, Technical Support .....	7-1
7.2	SIMATIC Customer Support Online Services .....	7-2
7.3	Regional Repair Centers .....	7-3

# Welcome to your SIMATIC PC

## Overview

Your device is a high performance industrial PC which is at home under the toughest conditions. It is shock resistant and functions in damp, dusty environments.

The Box PC 820 is intended to be installed in switchgear cabinets, switchboxes, control consoles or directly in the machines.

The PC FI45 V2 has a 19" housing with a flat display screen and membrane keyboard which make it especially suitable for installation where space is limited.

## Uses

Its high system performance and good expansion capabilities allow use in all areas of industrial production, especially for the demanding requirements of function and operation monitoring and securing.

With its integrated PROFIBUS-DP/MPI interface, the SIMATIC PC is ideal for all applications with process interfacing via decentralized I/O or with interfacing to other SIMATIC automation devices.

Typical usage areas are the acquisition, processing and archiving of process and machine data, visualizing material flow and production processes and in process instrumentation and control.

## Features

Key features are:

- Hard disk drives installed on vibration resistant mountings
- Hard disk drives designed for non-stop operation
- Monitoring of internal housing and processor temperature.
- Monitoring of programs (Watchdog)
- 2 PCI-slots, 1 shared ISA/PCI-slot, 2 ISA-Slots
- High brightness, 13.3" TFT high-contrast display and large viewing angle (FI 45 V2)

## Quality

The SIMATIC PC has a high quality standard. For example:

- Extensive climate, vibration and shock tests to guarantee industrial compatibility;
- Electromagnetic compatibility according to CE and FCC;
- UL/CSA-approval;
- Hotline, Service, spare parts;
- Quality assurance in accordance with ISO 9001.

## Functions

The SIMATIC PC is equipped with software that allows it to be used universally. The following software packages are available:

- Operating system Windows NT Workstation;
- Operating system Windows 98 SE
- Operating system Windows 2000
- Operating system MS-DOS 6.22

Due to its hardware, the SIMATIC PC additionally allows the use of:

- SIMATIC-supplementary software
- Software from the entire world of automation
- Software for PROFIBUS-DP

## Consignment/Assessories

- Power supply cable
- Windows-CD including a manual with the necessary Product ID
- CD *Documentation and Drivers* with electronic manuals (German, English) and drivers for Windows NT, Windows 98, Windows 2000 and MS-DOS.

The software supplied with the PC is preinstalled on the hard disk in one language.

Available separately are (see also catalog ST 70 or catalog CA01) :

- color monitor, printer and connecting cable
- SIMATIC-supplementary software
- memory expansion cards
- documentation (manuals for STEP 7 in one language).

## Device configuration

Order number								
FI45 V2 High End German	6ES7 645-3FB20-0AA0							
FI45 V2 High End English	6ES7 645-3FB20-0BA0							
FI45 V2 Low End German	6ES7 645-3BA20-0AA0							
FI45 V2 Low End English	6ES7 645-3BA20-0BA0							
Box PC 820 German	6ES7 647-3DC00-0DX0							
Box PC 820 English	6ES7 647-3DC00-0CX0							
Box PC 820 MS-DOS	6ES7 647-3DC00-0AX0							
Accessories								
Power cable		x	x	x	x	x	x	x
Windows NT 4.0 German		–	–	x	–	x	–	x
Windows NT 4.0 English		–	x	–	x	–	x	–
Windows 98 SE German		1)	1)	1)	–	–	–	–
Windows 98 SE English		1)	1)	1)	–	–	–	–
Windows 2000 Professional		1)	1)	1)	1)	1)	1)	1)
MS-DOS English		x	–	–	–	–	–	–
Documentation package		x	x	x	x	x	x	x
Equipment								
13,3" Display		–	–	–	x	x	x	x
Motherboard (with Ethernet)		x	x	x	x	x	x	x
CPU Intel Celeron 433 MHz		–	–	–	x	x	–	–
CPU Intel Pentium III Processor 700 MHz		x	x	x	–	–	x	x
Main memory 64 MB RAM		x	x	x	x	x	–	–
Main memory 128 MB RAM		–	–	–	–	–	x	x
Hard disk drive 10.2 GByte		x	x	x	x	x	x	x
CD-ROM 24 fach		x	x	x	x	x	x	x
1.44 MB floppy drive		x	x	x	x	x	x	x
Touchpad		–	–	–	x	x	x	x

1) To be ordered via configurator

## Information about this manual

This manual will introduce you to the technical features of your SIMATIC PC, so it doesn't matter whether or not you have industrial PC experience or not. We'll show you the most important components and procedures by means of task-oriented sections giving you information to start with practically any chapter.

It would be helpful if you already know how to use a mouse, windows and pull-down menus etc.

## Using the manual

Initial Situation	Corresponding Chapter
You have no experience with industrial PCs	Chapter 1 Important Notes Chapter 2 Unpacking and installing
You want to prepare and operate your industrial PC.	Chapter 3 Setting up and operating
You want to install additional hardware components.	Chapter 4 Expanding
You need exact information about the hardware.	Chapter 5 Technical specifications
You need support	Chapter 6 Error diagnostics Chapter 7 Hotline service
You need more information from the electronic manuals	Chapter 3.5 Electronic manuals

## Conventions

There are different modes to complete your tasks under Windows software. To make it easier for you, we explain how to fulfill your tasks by means of the menus. Apart from that, the following conventions are used:

Convention	Meaning
<b>Command &gt;sub command &gt;</b>	Specifies a menu command
" Inverted Comma"	Specifies the name of screen element ( e.g. a menu or a command button )
Double-click	A rapid and fast double-click on the standard mouse key (in general the left mouse key).

## Other documentation for the SIMATIC PC

An electronic manual on your hard disk and the included CD *Documentation and Drivers*.



# Important Notes

## Chapter Overview

This chapter provides you with mandatory safety instructions which you must follow when you operate your PC and its components.

This device corresponds to the relevant safety measures according to IEC, EN, VDE, UL, C-Tick and CSA. If you have questions about the permissibility of the installation in the designated environment, please contact our service representative. Chapter 7 contains the service address locations.

## 1.1 General Notes

### Transport

We recommend that you transport the device only in the original packaging (protection against shock and impact).

### Installation

Condensation can occur if the device is transported from a cold environment into the operating area. The device must be dry prior to startup.

Please observe the notes on ambient conditions in the section entitled "Technical Specifications," and the installation notes of this manual when installing and operating the device.

The device must be installed in such a way that it presents no danger of any kind (for instance if it falls over).

Be sure the fan ventilation slots are open so that a sufficient amount of air can be drawn in to cool the housing interior.

If the PC is to be permanently installed (in a rack, for example), the drive protection cover in front of the drives on the front side must be kept closed for safety reasons (fire protection according to UL 1950/EN 60950). The drive protection cover may be opened only to service the drives. Removal of the cover is not permitted.



#### Warning

When installing the systems, the permissible mounting positions must be observed (see Section 2.2.1).

Installation in an impermissible mounting position invalidates certification in accordance with UL 1950 and EN 6095.

---

## Cleaning

### Display, membrane keyboard

The surfaces of the display and membrane keyboard are waterproof and may be cleaned using a mild, non-abrasive cleansing agent.

## Power Connection

Check whether the device's set supply voltage is the same as the local supply voltage.

This device is equipped with a safety-tested power supply cable. You may connect this device only to a grounding outlet with a grounding contact.

Make certain that the socket outlet on the device or the grounding contact for the building wiring system is freely accessible.

The mains switch does not separate the device from the power system. To establish a complete power separation, you must disconnect the power plug (inlet connector on the back of the device). This location must be accessible. A central isolating switch must be present for cabinet mounting.

Install the cables so that no one can step on them or trip over them. When you connect the device, adhere to the relevant instructions in this manual.

Do not connect or disconnect power supply cables and data transmission lines during thunderstorms.

In emergency situations (for example, damaged housing, damaged operator elements, a damaged power supply cable, ingress of liquids or foreign particles), switch off the device. Disconnect the power plug and inform the responsible service personnel.

The PC must be switched off when you connect or disconnect I/O devices (keyboard, mouse, printer, etc.). You can damage the PC if you do not adhere to these instructions.

## Country-Specific Notes

For operation in Canada and the United States, use CSA or UL-listed power cables.

### **For the USA and Canada:**

Both a UL approval and a CSA marking are required for the cable in the USA and Canada. The connector must comply with the NEMA 5-15 specification.

### **For 120 V devices**

A flexible cable with UL approval and CSA marking and the following features must be used: SJT design with three conductors, at least 18 AWG cross-section, a maximum length of 4.5 meters and parallel grounding-type plug (15 A, at least 125 V).

### **For 240 V devices (within the USA and Canada)**

A flexible cable with UL approval and CSA marking and the following features must be used: SJT design with three conductors, at least 18 AWG cross-section, a maximum length of 4.5 meters and Tandem ground-type plug (15 A, at least 250 V).

### **For 230 V devices (outside the USA)**

A flexible cable with the following features must be used: At least 18 AWG cross-section and grounding-type plug (15 A, 250 V). The power cable must conform to the relevant safety guidelines of the country in which they are installed and bear the specified markings.

The device is intended for connection to grounded power supply systems (TN networks to VDE 0100 Part 300 or IEC 364-3).

No provision is made for connection to non-grounded or impedance-grounded power supply systems (IT networks).

The power cable must comply with the safety guidelines of the country concerned.

## Repairs

Only authorized personnel are permitted to repair the device. Unauthorized opening and improper repairs on the device can result in significant danger to the user.

Before you open the device, first switch it off and then disconnect the power plug.

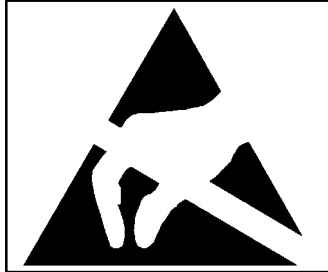
Install only system expansion devices provided for this computer. If you install other expansion devices, you can damage the system or violate the safety requirements and regulations for radio interference suppression. Contact your technical support team or where you purchased your PC to find out which system expansion devices may safely be installed.

If you install or exchange system expansions and damage your PC, the warranty becomes void.

Only authorized service personnel may remove or replace the power supply unit.

## ESD Guidelines

The following sticker can be used to identify modules with ESD (electrostatically-sensitive devices):



If you handle modules with ESD, it is essential that you adhere to the following guidelines:

- Before you work with modules with ESD, you must statically discharge yourself (for example, through contact with a grounded object).
- Devices and tools you use must be free of a static charge.
- Disconnect the power plug before you connect or disconnect modules with ESD.
- Touch modules with ESD on the edge only.
- Do not touch any wiring posts or conductors on a module with ESD.

## 1.2 Notes on the CE Symbol



The following applies to the SIMATIC product described in this manual:

### EMC Directive

In accordance with the EU Directive 89/336/EEC "Electromagnetic Compatibility." In accordance with the CE label for this product, the following areas of application are relevant:

Application Area	Requirements	
	Emitted Interference	Immunity
Domestic, business and commercial areas, as well as small businesses	EN 50081-1: 1992	EN 50082-1: 1992
Industrial area	EN 50081-2: 1993	EN 50082-2: 1995

In addition, the EN 61000-3-2:1995 (harmonic currents) and EN 61000-3-3:1995 (voltage fluctuation and flicker) have been fulfilled.

### Low-Voltage Directive

This product complies with the requirements of the EU Directive 73/23/EEC "Low-Voltage Directive." Conformance with this standard has been verified according to EN 60950.

### Declaration of Conformity

The EU declarations of conformity and the relevant documentation are held at the disposal of the competent authorities at the address below:

Siemens Aktiengesellschaft  
 Bereich Automatisierungs- und Antriebstechnik  
 A&D AS E 4  
 Postfach 1963  
 D-92209 Amberg  
 Germany  
 Tel.: +49 9621 80 3283  
 Fax: +49 9621 80 3278

### Observing the Installation Guidelines

The installation guidelines and safety instructions specified in the documentation must be observed during startup and operation.

## Connecting Peripherals

The requirements regarding noise immunity (EN50082-2:1995) are met when you connect a peripheral switche for an industrial environment.

---

### Note

Any other devices which are connected to this product must also be radio interference suppressed according to the European Economic Community Directive 89/336/EEC. Products which fulfil these specifications carry a manufacturer's certificate and carry the CE symbol.

---

## ISO 9001 Certificate

The quality assurance system for the whole product process (development, production, and marketing) fulfils the requirements of ISO 9001 (corresponds to EN29001: 1987).

This has been certified by the German society for the certification of quality management systems (DQS).

EQ-Net certificate no.: 1323-01

## 1.3 Approvals for the USA, Canada and Australia

### Security



One of the following markings on a device is indicative of the corresponding approval:

Underwriters Laboratories (UL) to standard UL 1950



Canadian Standard Association (CSA) to standard C22.2. No. 950

**EMC**

**USA**

---

**Federal Communications Commission  
Radio Frequency Interference Statement**

---

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.

---

**Shielded Cables**

---

Shielded cables must be used with this equipment to maintain compliance with FCC regulations.

---

**Modifications**

---

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

---

**Conditions of Operations**

---

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.

**Canada**

---

**Canadian Notice**

---

This Class B digital apparatus complies with Canadian ICES-003.

---

**Avis Canadien**

---

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

**Australia**



This product meets the requirements of the AS/NZS 3548 Norm.





# Unpacking and Installing

# 2

## Chapter Overview

This chapter describes how to install your device and contains all the information you need to know about its most important components:

- Device models
- Installing and transporting
- Hardware components/interfaces
- Installing your PC
- Drives

## 2.1 Device Models

### Box PC 820

The Box PC 820 is intended to be installed in switchgear cabinets, switchboxes, control consoles or directly in the machines.

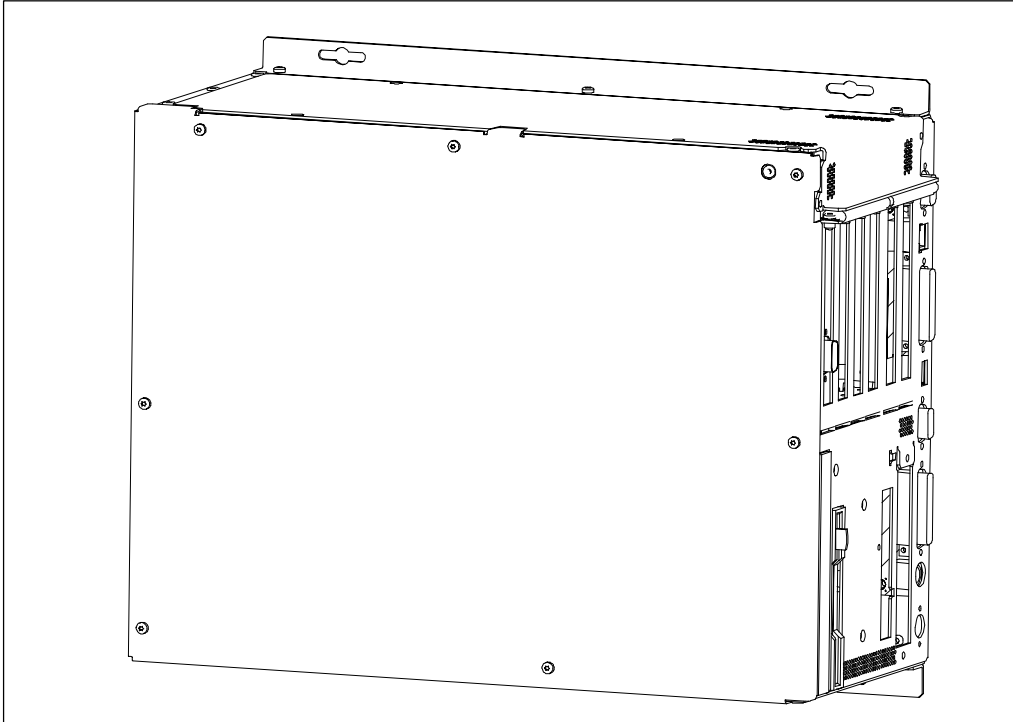


Figure 2-1 Box PC 820

## PC FI45 V2

The PC FI45 V2 has a 19" housing with a flat display screen and membrane keyboard which make it especially suitable for installation where space is limited.

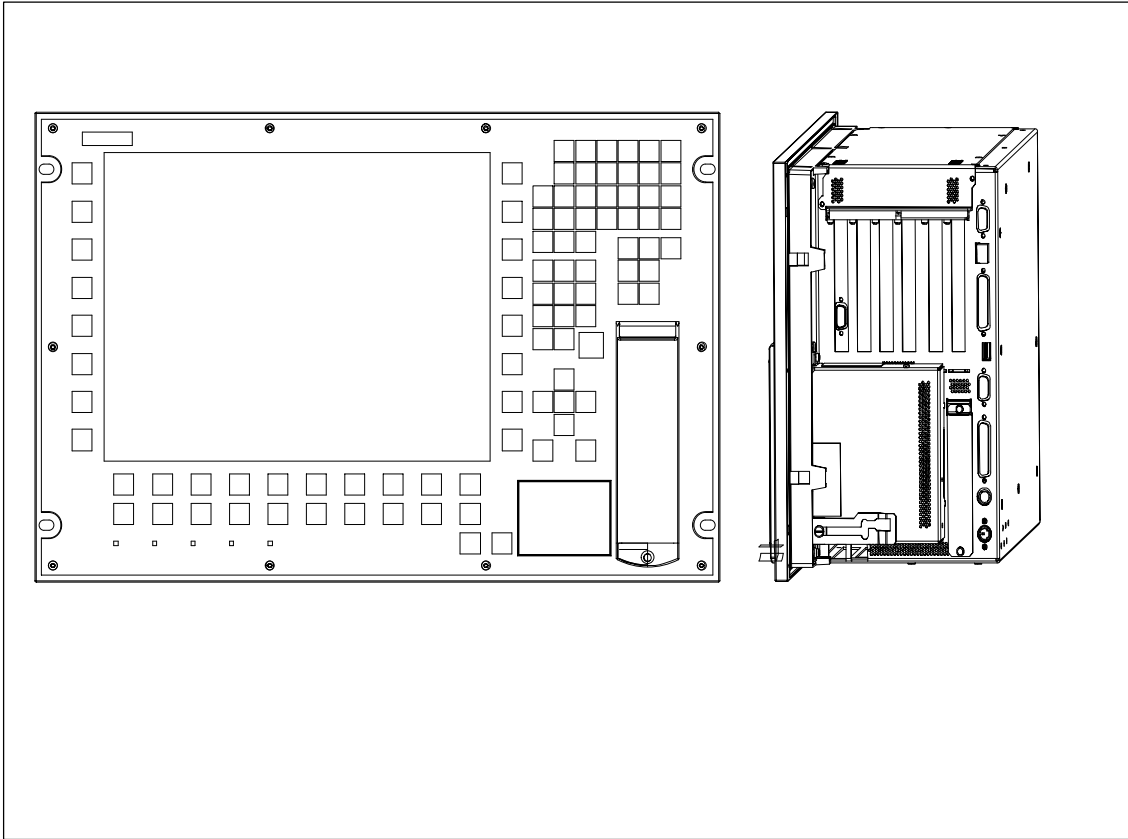


Figure 2-2 PC FI45 V2

## 2.2 Installing and Transporting

### Unpacking

Unpack your device as follows:

1. Remove the packing.
2. Do not throw the original packing away. Keep it in case you have to transport the unit again sometime in the future.
3. Check with the packing list to make sure no components are missing.
4. Please keep the documentation in a safe place. It contains important information on the operation of your device.
5. Check the packing and its contents for any shipping or transport damage.
6. Please inform your local dealer of any shipping or transport damages and of outstanding items indicated on the packing list.



#### Caution

Risk of mechanical damage of your device!

When transporting your PC in cold weather when it may be exposed to extreme variations in temperature, make sure that no moisture or condensation can form on or in the unit.

The unit should be allowed to reach room temperature slowly before it is started up. If condensation has formed, the unit should be left for about 12 hours before being switched on.

---

### Recording the Serial Number

7. Your PC is identified by a serial number (F-Nr.). Enter this number in the table below.

If a PC is stolen and subsequently submitted for repair, the repair center will be able to identify it by the F-Nr..

### Enter the Microsoft Windows “Product ID” from the “Certificate of Authenticity”

8. Enter the Microsoft Windows “Product ID” from the “Certificate of Authenticity” (COA) in the table. You will find the “Product ID” on the Windows manual or the device. You need the Windows “Product ID” if you want to reinstall the operating system.

F-Nr.	
Order No.	
Microsoft Windows Product ID	

## Installing

Your SIMATIC PC is suitable for installation in consoles, switchgear cubicles, and control panels. You can find the installation instructions on the following pages.

## Transport

Despite the fact that the device is of rugged design, its internal components are sensitive to severe vibrations or shock. You must therefore protect your PC from severe mechanical stress when transporting it. Use the original packing material if you have to ship the PC from one location to another.

## 2.3 Hardware Components

### Front

All important operator controls and displays are located on the front of the unit.

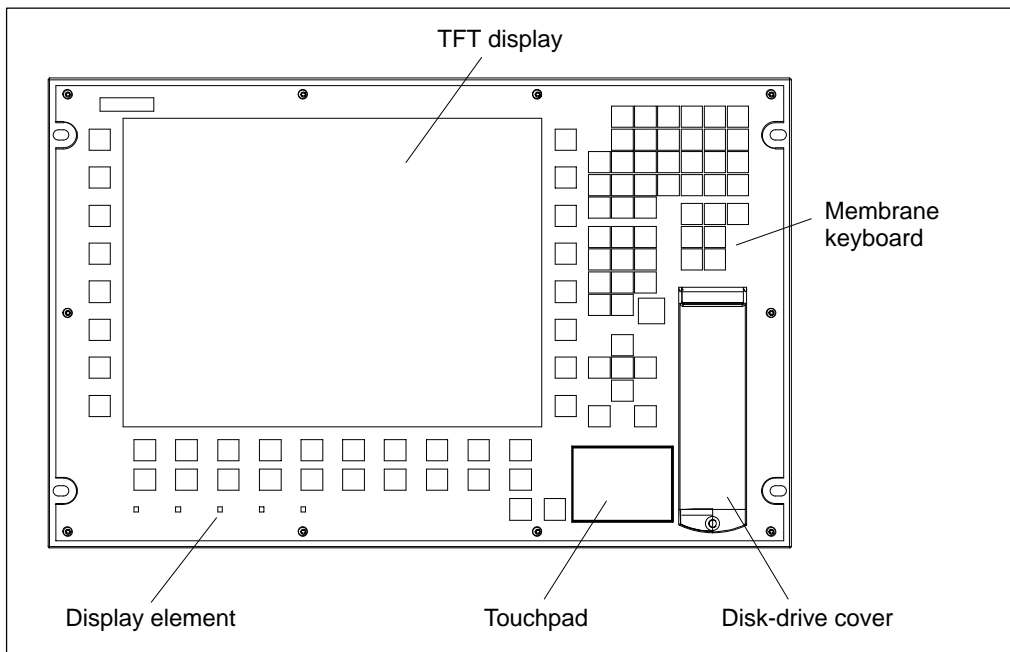


Figure 2-3 Example: Front FI 45 V2

## Right-side Panel (Connectors)

All the interface ports for connecting to external devices are located on the right side of the device.

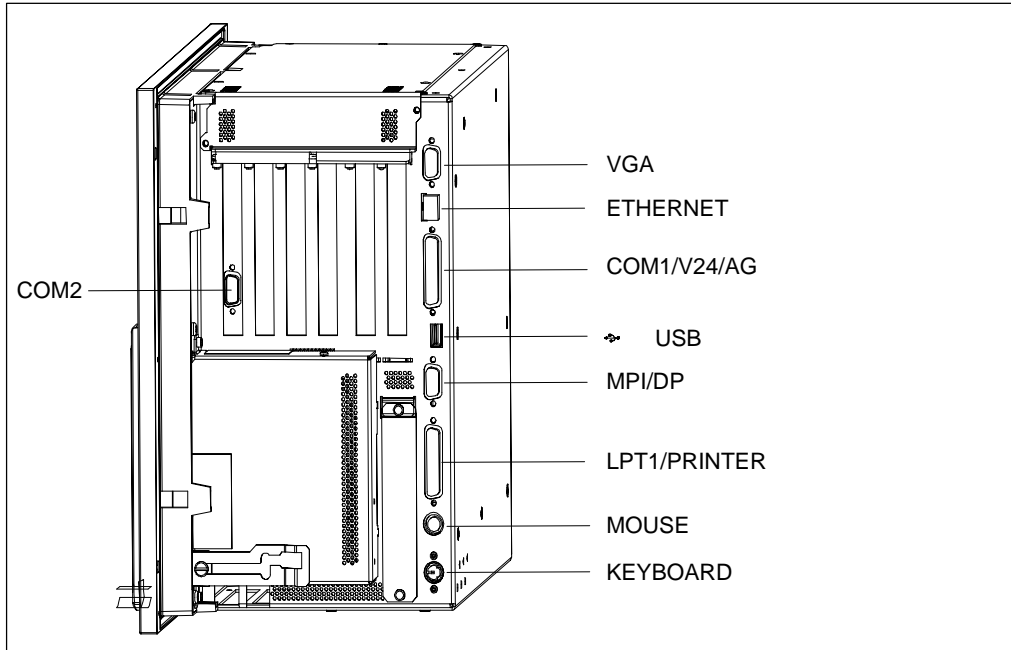


Figure 2-4 Connectors on the right-side panel

Connection	Function	Box PC 820	PC FI45
VGA	VGA port for connecting an external monitor 15-pin, sub D socket connector	yes	yes
ETHERNET *	Connection of a RS485 Ethernet cable	yes	yes
COM1/V24/AG	Serial port 1 (V.24/RS232C) 25-pin, sub D socket connector	yes	yes
USB **	Connection of high current USB devices	yes	yes
COM2/V24	Serial port 2 (V.24/RS232C) 9-pin, sub D connector	yes	yes
MOUSE	PS/2 mouse port	yes	yes
KEYBOARD	PS/2 keyboard port	yes	yes
LPT1/PRINTER	Parallel port Port for devices with a parallel port (such as a printer) 25-pin, sub D socket connector	yes	yes
MPI/DP (RS 485)	Multipoint interface / PROFIBUS DP connection For connecting an S7 programmable controller 9-pin, sub D socket connector	yes	yes

\* Galvanic isolation within the safety extra-low voltage circuit (SELV)

\*\* The USB connection is supported only by Windows 98 at this time. In addition, the BIOS setup can be controlled by USB keyboard.

## Left-side Panel

The power supply connectors are on the left side of the device.

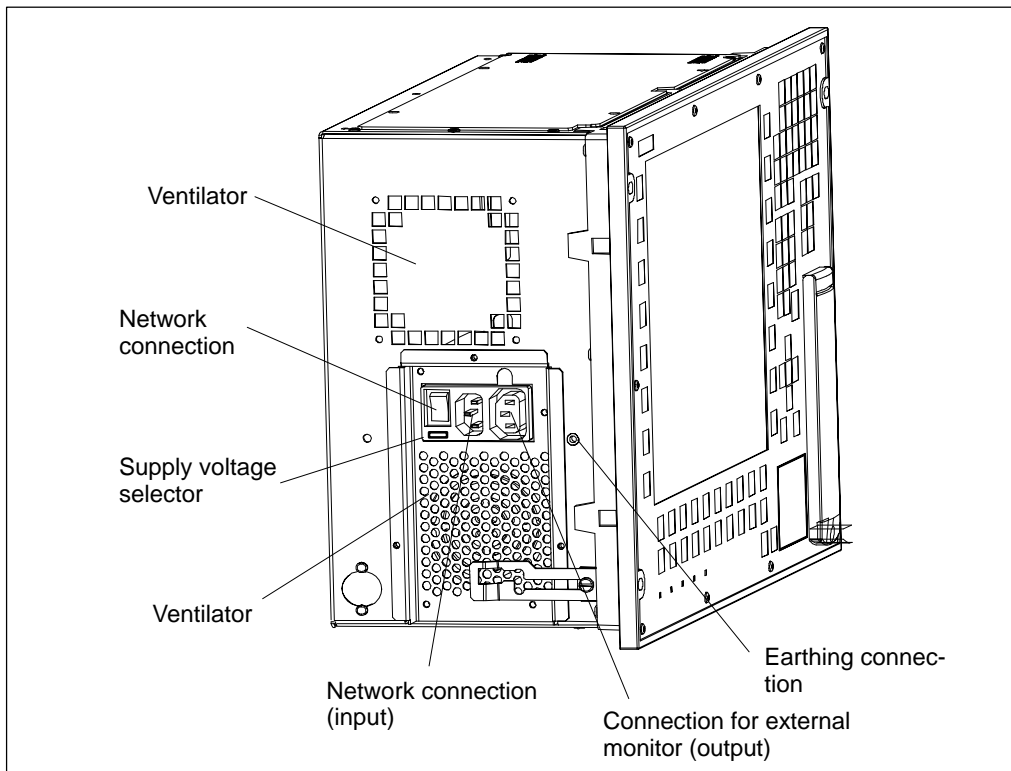


Figure 2-5 Connectors on the left panel

Connection	Function	Box PC 820	PC FI45
Power supply connector (input)	Network connection (115/230V AC)	yes	yes
Power supply connector (output)	Network connection for external monitor (115/230V AC)	yes	yes

## Ventilating Slots

The raised air outlet slots for ventilation are located at the front and back side. These slots must not be covered in any way.



### Caution

Risk of overheating!

If you cover up the slots for the inlet and outlet air in any way, there is a risk that your PC will be damaged.

## 2.4 Installation

Please observe the following when installing your SIMATIC PC:

- Position the PC so as to avoid reflections on the screen as much as possible.
- Base your choice of mounting height on the position of your monitor, which should always be at an optimal height for the operator.
- Do not expose your PC to direct sunlight.
- Do not install the PC in such a way that the ventilation slots in the PC housing are covered.
- The cabinet or control panel in which you install the PC should always provide sufficient space for proper air circulation.



### Warning

Avoid extreme environmental conditions whenever possible. Protect your SIMATIC PC from dust, moisture, and heat.

The device must be installed in such a way that it poses no danger (for example, by tipping over).

The clearance at the sides and rear of the system unit must be at least 100 mm in order for the unit to be sufficiently ventilated.

Do not cover the ventilating slots of the system unit.

When installing the system, remember to observe the permissible mounting positions.

Installation of a system in an inadmissible mounting position invalidates the UL 1950 and EN60950 approvals.

---



## Installing the Box PC 820

The Box PC 820 is equipped with two mounting brackets. Four M4 bolts (two for each bracket) are needed to mount the unit.

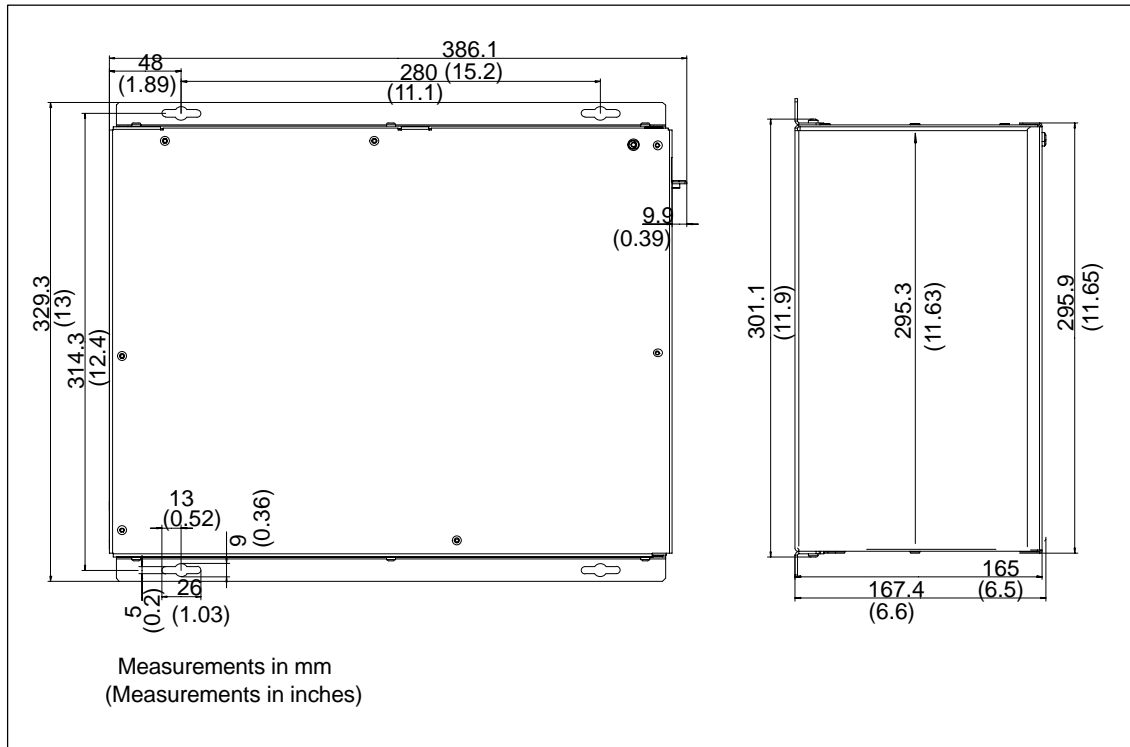


Figure 2-6 Box PC 820 installation measurements

### Note

The permissible mounting positions for the box also apply for the PC FI45 system, whose main component is also a box.

The Box PC 820 can be installed in various positions. However, the side with the power supply and the fan should never be face downwards. When installing the device, you must also take into consideration the permissible installation positions for the floppy disk drive (see Figure 2-7). The drive support with the mounted floppy disk drive and CD-ROM drive can be rotated through 90° to match the installation position (to modify, see the manual).

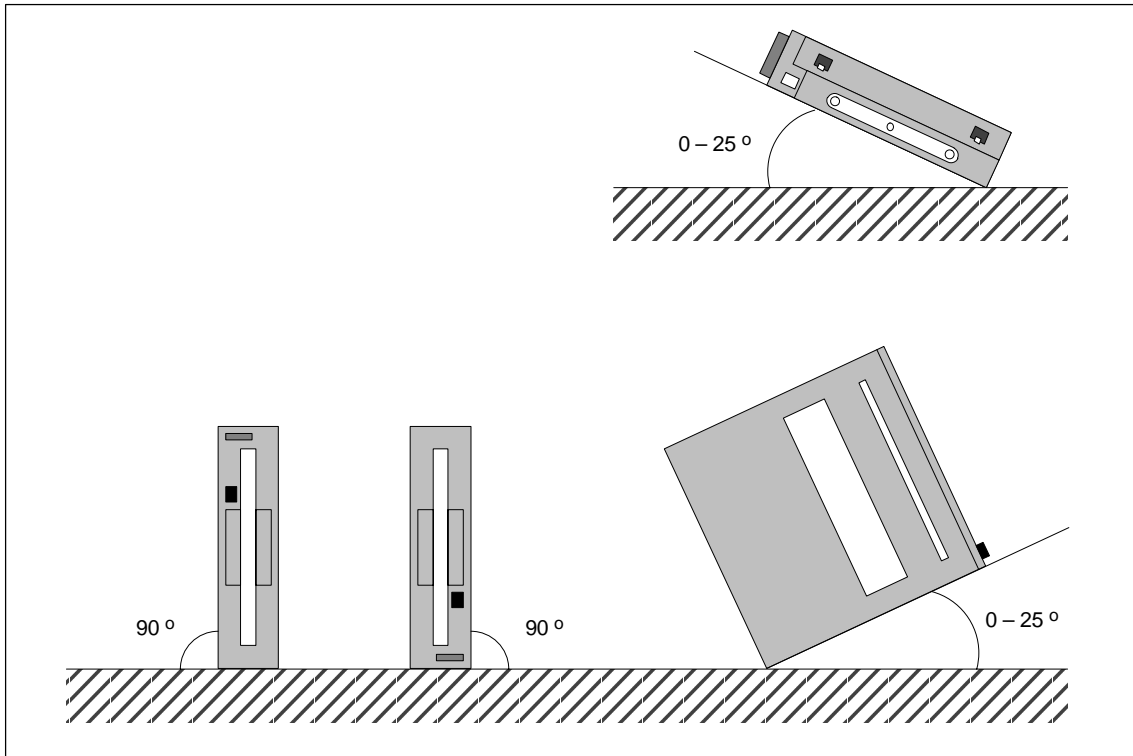


Figure 2-7 Permissible Installation Positions for Floppy Disk Drive

## Installing the PC FI45 V2

### Panel Mounting

Proceed as follows:

- Place the device in the prepared panel cutout (see Figure 2-8) and protect it against falling out until it can be permanently secured.
- Make sure that the seal is properly attached.
- Clamp the device in the panel with the ten screw clamps (threaded spindles) provided by hooking a screw clamps onto the front frame of the PC and turning the threaded spindle from the back toward the panel.



### Caution

Only turn the threaded spindle until the rear side of the front frame is resting on the control panel.

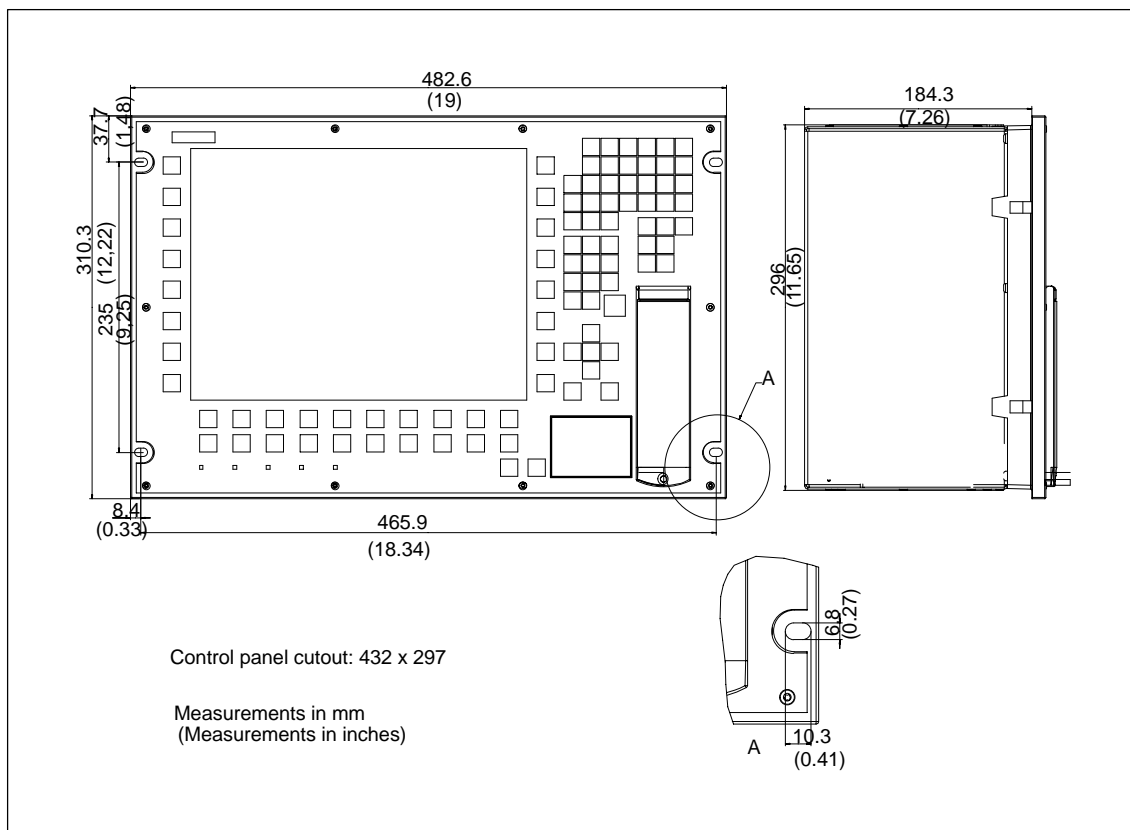


Figure 2-8 Mounting the PC FI 45

### Installation in 19" Cabinet

Proceed as follows:

- Install the device in the correct position in the cabinet and ensure that it cannot fall out.
- Secure the device in the cabinet with 4 screws M5 x 20.

## 2.5 Drives

### Disk Drive Cover (PC FI45 V2)

The disk drives of your SIMATIC PC are protected against dirt penetration by a cover.

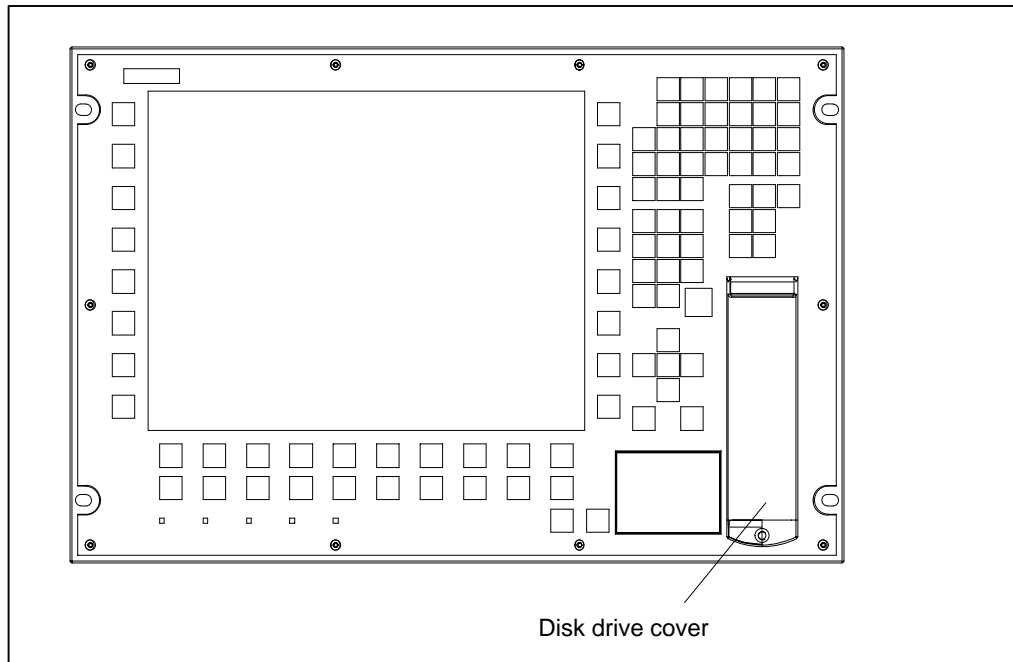


Figure 2-9 Disk drive cover

- Open the disk drive cover by loosening the screw to gain access to the drives.
- To protect the drives, the cover has to be closed during operation. The IP65 and UL1950 requirements are only fulfilled when the cover is closed. The cover may be opened in order to insert or exchange storage devices.
- The screwed-in disk-drive cover also prevents unauthorized access.

# Setting Up and Operating

# 3

## Chapter Overview

This chapter describes all the actions that you must perform in order to set up your workplace successfully:

- Connecting the device to the power supply
- Connecting I/O devices
- Information about the keyboard
- Using the electronic documentation
- Backing up hard disk data on diskettes.

### 3.1 Connecting the SIMATIC PC to the Power Supply

#### Earthing Measures

Low-resistance earthing connections ensure that the user of the plant is protected against an electric shock (for example, if a short-circuit occurs, or if there are defects in the system). Moreover, they discharge interference transmitted by power supply cables, signal cables, or cables to peripheral equipment.

You should therefore create a low-resistance connection (a large surface acting as the contact) between the earthing point on the system housing and the central earthing point of the cabinet or the plant in which the computer is to be installed. The minimum cross-section should not be less than 5 mm<sup>2</sup>.

The earth connection is located on the left-hand side of the device to the right of the fan for the power supply.

#### Changing the Supply Voltage

The standard power supply for the SIMATIC PC is set for 115/230V networks. The voltage selection switch is located next to the appliance socket.

You must ensure that the supply voltage set at the voltage selection switch matches the local supply voltage.

#### Selecting Supply Voltage <sup>1)</sup>

If the voltage displayed on the system selector switch does not correspond with your local voltage, you must move the supply voltage selector so that the marker points to the required supply voltage.

To do this, use a small, flat screwdriver to lever out the part with the voltages printed on it and replace it in the appropriate position.

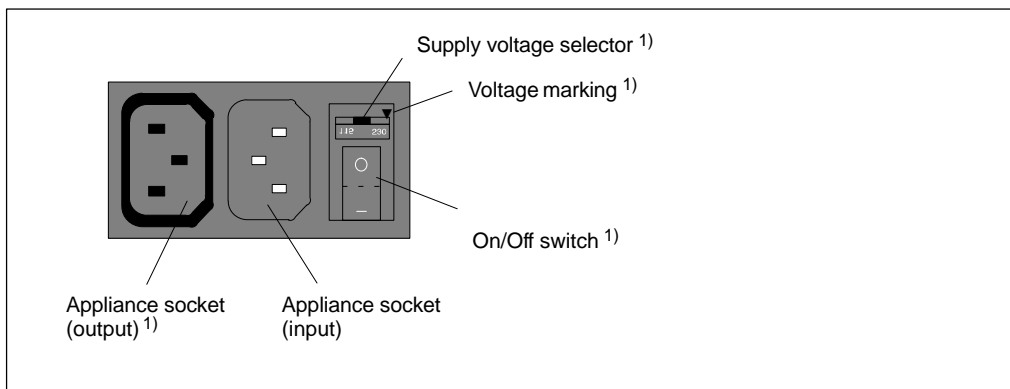


Figure 3-1 Supply Voltage Selector

<sup>1)</sup> Not applicable for devices with wide range power supply units

**Caution**

Damage may be caused to the device!

Operating the PC with the wrong supply voltage setting may damage the device. The same voltage is applied to the supply voltage output and the supply voltage input.

Please observe the specifications made by the monitor manufacturer when operating the monitor.

The following table lists the permissible input currents for the monitor:

---

Input voltage	120 V / 240 V
Input current	8A / 4A
Output voltage	Equal to input voltage
Max. output current	3A / 1.5A

### 3.2 Connecting I/O Devices

The Box PC 820 and the PC FI45 V2 are designed so that the box represents the core component of the two systems. This means that all interfaces and connections provided on the Box PC 820 are also provided on the PC FI45 system. The differences in the three are listed in the table below.

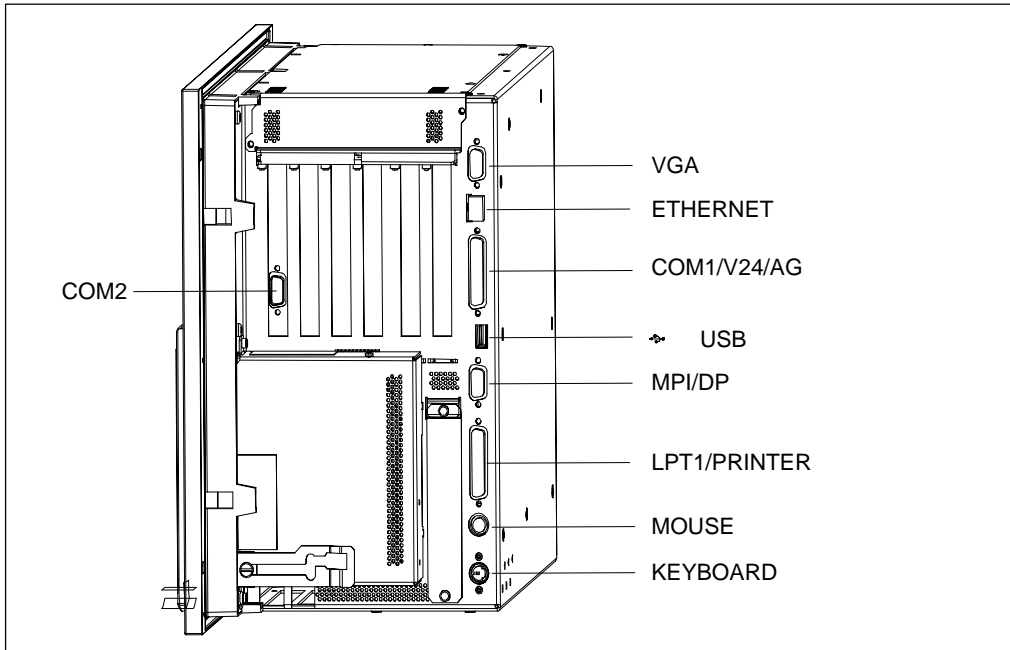


Figure 3-2 Connectors on the right-side panel

---

**Note**

Always be sure to use shielded cables and metal connectors to avoid invalidating your operating permit. Use a screwdriver to fasten the interface cable connectors on the PC housing to improve electrical shielding.

---



Connection	Function	Box PC 820	PC FI45
VGA	VGA port for connecting an external monitor 15-pin, sub D socket connector	yes	yes
ETHERNET *	Connection of a RS485 Ethernet cable	yes	yes
COM1/V24/AG	Serial port 1 (V.24/RS232C) 25-pin, sub D socket connector	yes	yes
USB **	Connection of high current USB devices	yes	yes
COM2/V24	Serial port 2 (V.24/RS232C) 9-pin, sub D connector	yes	yes*3
MOUSE	PS/2 mouse port	yes	yes
KEYBOARD	PS/2 keyboard port	yes*4	yes*2
LPT1/PRINTER	Parallel port Port for devices with a parallel port (such as a printer) 25-pin, sub D socket connector	yes	yes
MPI/DP (RS 485) *5	Multipoint interface / PROFIBUS DP connection For connecting an S7 programmable controller 9-pin, sub D socket connector	yes	yes

If expansion boards are connected in the PC, there are additional interfaces. Please refer to the description of the relevant module for the significance of these additional interfaces.

- \*1: On the FI45, the PS/2 mouse port is already occupied by the sensor field (Touch Pad) which is installed as standard. An external mouse can also be connected. In this case, the Touch Pad does not function.
- \*2: On the FI45, a PS/2 keyboard can be interfaced to the front panel of the PC. The port is located behind the front cover. The box's PS/2 keyboard port can be used only alternatively, not at the same time as the front-panel port.
- \*3: When used, the optional touch screen (see 4.8) is assigned to the COM2 interface. COM 2 is then not available for other devices.
- \*4: It is possible to connect keyboards with an integrated trackball (for example, PG 720 or PG 740).
- \*5 : Optically solated within the safety extra low voltage circuit (SELV).

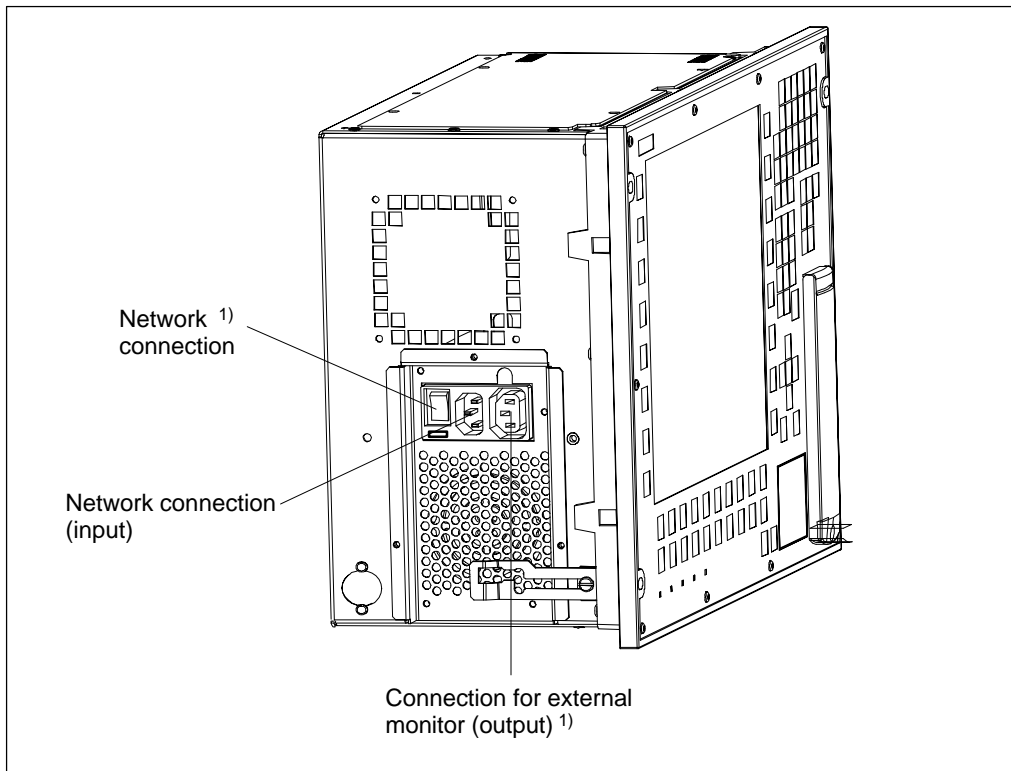


Figure 3-3 Connectors on the left panel

**Note**

Once the power supply cable has been inserted, it must be secured with the strain relief clamp supplied. This prevents the power supply connector from being disconnected.

Connection	Function	Box PC 820	PC FI45
Power supply connector (input)	Network connection (115/230V AC)	yes	yes
Power supply connector (output)	Network connection for external monitor (115/230V AC)	yes <sup>1)</sup>	yes <sup>1)</sup>

<sup>1)</sup> Not available for devices with wide range power supply unit

## Recommended Printers

Siemens printers with a parallel interface and IBM character set are recommended for use with the SIMATIC PC.

## Connecting the Printer to the Parallel Port

To connect your printer, proceed as follows:

1. Switch off the SIMATIC PC and printer.
2. Plug the printer cable into the LPT1 parallel port.
3. Plug the printer cable into the parallel port of the printer.
4. Screw the connector tight to the interface port.



### Caution

Risk of damage to the unit!

Switch off the unit before connecting the parallel printer to the LPT 1 port (the printer should also be switched off).

Make sure that you use the right port, otherwise you may damage the printer or the PC.

The interface port may be damaged if you confuse the connections or use the wrong connecting cables.

Before plugging in the cables, the electrostatic charge of your body, the unit and the cables must be equalized. To do this, briefly touch an earthed object (ESD Guidelines).

Only use the original connecting cables.

---

## Connect Ethernet

The drivers for the Ethernet interface are pre-installed. A wait period of approximately 30 results if no Ethernet cable is inserted or no active node is found during the startup of the operating systems Windows 98 or Windows NT.

---

### Note

A class 5 Ethernet cable is necessary for interface operation at 100 Mbit/s.

---

If you do not want to use the Ethernet interface, you can turn it off in the BIOS setup (setting disabled). This results in no waiting period.

In the BIOS setup, the following settings are possible for the Ethernet interface:

---

### Note

Disabled: Ethernet deactivated.

The Ethernet interface hardware is turned off. It is not possible to operate the interface within the operating system.

Enabled: Ethernet activated.

It is possible to plug in and operate the network cable at any time later during operation (hot plug).

If no cable is plugged in when the system starts up, the device checks whether or not an Ethernet cable is inserted for about 30 seconds when it first boots and for about 40 seconds after returning from the suspend mode. If there is an active network connection, there are no noticeable delays.

Auto: When you boot, the system checks whether or not a network is attached. If a network is found, the Ethernet interface remains activated. If no network is found, the Ethernet interface is deactivated.

When you boot, the status of the Ethernet hardware is displayed in the Summary Screen. If you plug in the cable later during operation, you must first reboot the system before you can use the network. A hot plug is not possible with this setting.

---

### 3.3 Operating Elements and Displays

The operating elements for both systems can be broken down as follows:

Operating Element	Function	Box PC 820	PC FI45
Keypads on the sealed keyboard			
Function keys	Entering function codes	—	Included
Alphanumeric and symbol keys	Entering text	—	Included
Numeric keypad, cursor control, and control keys	Entering numbers, positioning the cursor, scrolling	—	Included
Sensor field (finger mouse, touch pad)	Positioning the cursor, triggering functions, mouse replacement	—	Included
Reset key	Resetting the device (complete restart)	Included *3	Included *4
Floppy disk drive	Loading programs/data	Included	Included *1
CD-ROM drive	Loading programs/data	Included	Included *1

- \*1: On the FI45, the floppy disk drive is located at the front, behind a sealing cover. The IP 65 protection provided for the front panel can be maintained only when this cover is closed.
- \*3: The reset key (in preparation) is located on the box near the ISA slot boards.
- \*4: The reset key (in preparation) is located on the front panel behind the sealing cover. The reset key can only be activated by means of a pointed object (for example, a pen or the tip of an extended paper clip).

### 3.3.1 Input Fields on the FI45

#### Function Keys and Symbol Keys

The function key and symbol key assignments depend on the operating system and/or user program.

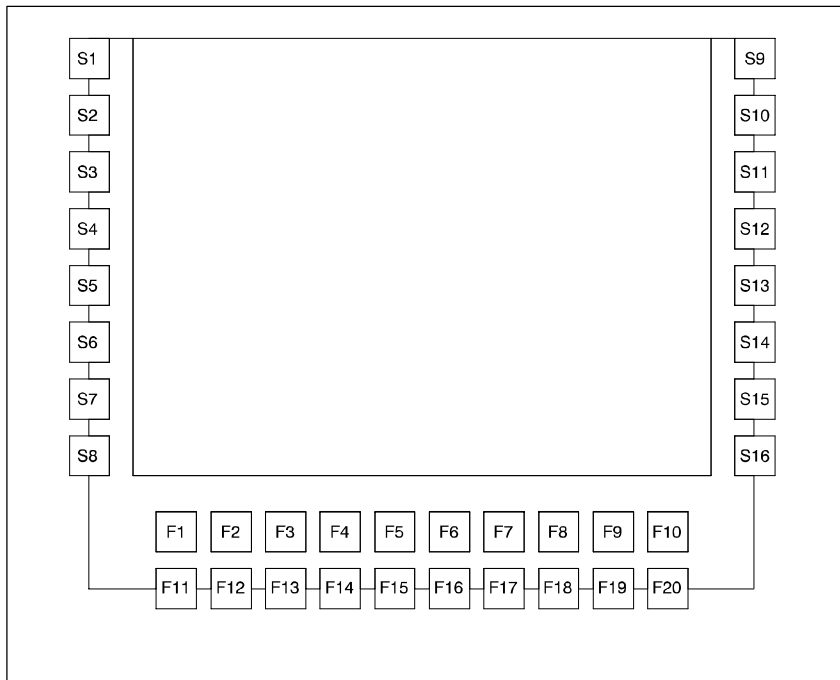


Figure 3-4 Function Keys and Symbol Keys

**Alphanumeric / Symbol Keys**

The letters and symbols are arranged alphabetically in a matrix (see 3-5):

	( A	) B	& C	\$ D	? E	[ F
	] G	@ H	% I	! J	{ K	} L
↑	# M	" N	' O	< P	> Q	~ R
┌	- S	' T	^ U	/ V	\ W	 X
SHIFT	: Y	; Z				

Figure 3-5 Alphanumeric / Symbol Keypad

**Note**

Key combinations: SHIFT + KEY = Symbol  
 ↑ + KEY = Upper-case letter

### Numeric Keypad, Cursor Control Keys, and Control Keys

In addition to digits, the numeric keypad also contains the spacebar, the decimal point, the symbols for the four basic arithmetic functions, and the tabulator, backspace and enter keys; the control keys are at the left of the numeric keypad.

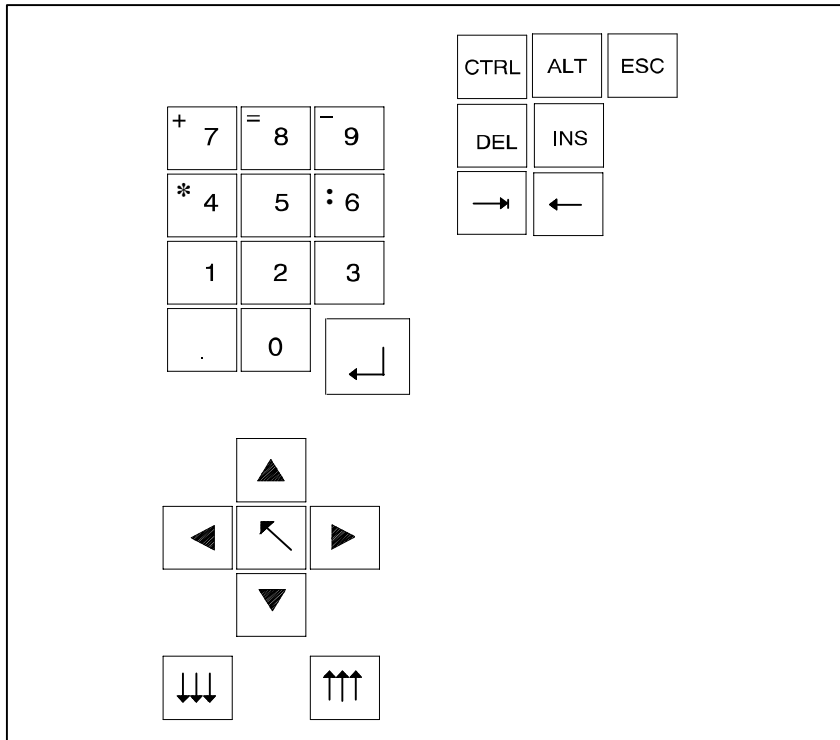




Figure 3-6 Numeric Keypad, Cursor Control Keys, and Control Keys

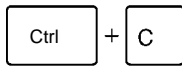


## Important Key Combinations

Key combinations are formed with the  and/or  keys, and are entered as follows:

- Press and hold the  and/or  keys.
- Press the key for the required function.

### Abort current operation



Aborts the operation currently in progress, but does not clear the line buffer.

### Warm restart



This key combination restarts your PC.

---

### Note

For additional key combinations, please refer to the documentation provided with your operating system as well as that for your user program.

---

## Sensor Field (Finger Mouse or Touch Pad)

You can use the sensor field as though it were a mouse. The mouse pointer makes the same moves on the screen as your finger makes as it moves over the surface of the sensor field. The L and R keys to the left of the touch pad correspond to the left (L) and right (R) mouse button.

You can click on symbols or texts using the two mouse buttons. First, move the mouse pointer to the symbol you want, then press the left mouse button to select that symbol.

Alternatively, when using a full-graphics operator interface, such as Windows, you can click on a symbol and move the mouse pointer to that symbol. Then briefly press the sensor field with your finger twice in succession to open the symbol.

You need not put pressure on the sensor field surface. The sensor does not respond to the pressure of your finger, but rather to the change in capacitance at the point of contact.

### 3.3.2 Floppy Disk Drive

Floppy disk drives are equipped with an access slot for the diskettes; this slot is covered by a flap. When a floppy disk is inserted incorrectly, it will not fit in the slot. A disk can be ejected by pushing the eject button on the drive.



**Caution**

The eject button must never be pressed while the green LED on the drive is on.  
Caution: This could result in loss of data.

---

### 3.3.3 Reset Key

Pressing the reset key triggers a hardware reset. The PC is restarted.



**Caution**

Data loss possible!

---

On the PC FI45, the reset key is integrated in the front panel under the cover next to the floppy disk drive. The reset key can only be activated with a pointed object (for example, a pen or the tip of an extended paper clip).

On the Box PC 820, the reset key is situated below the slot boards. You can activate the reset key by hand, without using any additional tool. The reset key can only be activated with a pointed object (for example, a pen or the tip of an extended paper clip).

### 3.3.4 CD-ROM Drive

The CD-ROM drive enables you to update your software easily. The drive is operated via the secondary IDE interface.

#### Opening the Drawer

By briefly pressing the eject button, the drawer springs out slightly. Now pull the drawer out until it clicks into position.

#### Inserting / Removing CDs

Now insert the CD in the drawer with the label face up (Box PC 820) or to the left (PC F145), and press it firmly down into the center of the turntable. To remove the CD, hold it by the edges and pull upwards.



#### Caution

To avoid too much pressure on the open drawer, **always** hold the drawer at the front with one hand when inserting or removing a CD.

#### Closing the Drawer

Push in the drawer until it closes completely. Do **not** press the eject button.

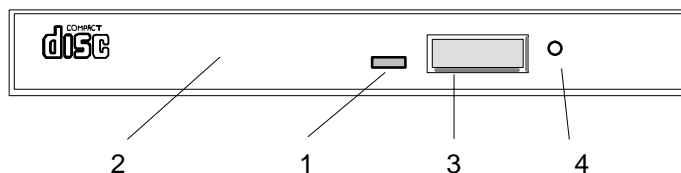
#### Note

The EJECT function offered by various applications for opening the CD-ROM drawer does not work with this drive.

After the drawer has been closed, the CD is tested and the access display light on the drive starts to flash:

- If the display flashes continually, the CD is faulty but can still be read,
- If the display flashes several times and then remains lit, the CD you have inserted is defective and cannot be read.

#### CD-ROM Front



- 1 Access display
- 2 Drawer
- 3 Eject button
- 4 Emergency eject

### Emergency Eject

The procedure described below can be used to remove a disc from the CD-ROM reader if the Open/Close button is disabled by software or a power failure occurs. In this case the CD tray cannot be opened automatically.

1. Turn off the power to the CD-ROM reader (switch off your device if necessary).
2. Insert a steel rod or a stiff paper clip (with a maximum diameter of 1.3 mm and a minimum length of 55 mm) into the emergency eject hole at the front of the drive and push lightly. The CD tray is ejected by about 10 mm. Pull it all the way open by hand and lift the disc out carefully.

### 3.3.5 Display

The PC FI45 are equipped with 13.3" LCD displays. These displays are precabled and preset at the factory. VGA monitors can be operated in parallel to these displays. The specification as to whether to operate only a display or a VGA monitor in parallel is made in BIOS Setup.

### Recommended Monitors

You can connect external multisynchronous monitors using the standard VGA connector on the interface panel of the unit. We recommend that you use Siemens monitors.

### Connecting Monitors

You must switch off the device before connecting the monitor cable.

Connect the monitor as follows:

1. Switch off the SIMATIC PC and the monitor.
2. Plug the monitor cable into the VGA socket.
3. Plug the other end of the monitor cable into the monitor.

For technical specifications on the graphics interface, please refer to the chapter 5.



#### Caution

Danger of damaging the monitor!

If you want to set higher frequencies and resolutions, first make sure that the monitor you are using is suitable for a higher frequency and resolution.

If the frequency is too high, this may damage the monitor.

---

### 3.3.6 LEDs

At the front bottom left you will find five light-emitting diodes.

MPI/DP LED	green off	Data exchange on the Profibus DP No data exchange on the Profibus DP or No connection to the Profibus DP
Disk LED	green	Lights up for a hard disk access
Run LED	green red off	Watchdog monitor switched on Monitoring time run out No watchdog monitor active
Temp. LED	green red	Temperature in the device is normal Inner temperature is critical
Power LED	green off	Power supply switched on Power supply switched off

## 3.4 Starting Up Your PC for the First Time

### Switching ON

Once the I/Os and the system unit have been connected, your PC is ready to be put into operation.

Plug your PC into the mains power supply.

### Switching OFF

Disconnect your PC from the mains supply.

---

#### Note

The PC has no ON/OFF switch (not available for devices with wide range power supply unit). In order to disconnect the PC from the power supply, you must pull the plug.

When the PC is on, the POWER LED green light is lit.

---

## 3.5 Setting Up Your PC

### Overview

Your PC's operating system and system software were preinstalled on the hard disk at the factory. Either a multilingual version of MS-DOS 6.22 (English) or Windows NT (German or English) was installed.

When powering up the PC, you must distinguish between the following:

- Cold start (also called an initial start)
- Complete restart

### Cold Start

Your PC software is set up during a cold start. Proceed as follows:

1. Switch on your PC.
2. Set the monitor's brightness control to the brightest setting (refer to the monitor's operating instructions) and switch on the monitor (applies to the Box PC 820 only).

The PC executes a self-test. The following message appears on the screen during the self-test:

```
Press <F2> to enter SETUP
```

3. Wait until the message disappears, then follow the instructions displayed on the screen.

Your operating system is loaded upon completion of the self-test. The load procedure itself depends on the operating system.

### Complete Restart

Once it has been set up, the operator interface of the operating system you are using is displayed following system startup every time you switch on or reset the PC.

## 3.6 Electronic Manual

### Overview

Devices with preinstalled software are equipped with an electronic manual.

The manual is on the included CD *Documentation and Drivers*. You can navigate on the CD with the help of the Adobe Acrobat Reader.

### Adobe Acrobat Reader

In order to read and print the documentation (PDF-Dateien) you need Adobe Acrobat Reader. Proceed as follows:

- Start the Adobe Acrobat Reader with **Start > Programs > Adobe Acrobat > Acrobat Reader 3.01** or start the application **Start.exe** on the CD *Documentation and Drivers*.

This software is not preinstalled for licensing reasons, and must be installed by the user.

### Installing the Adobe Acrobat Reader

You can find installation instructions in the CD booklet or in the file *start.exe* on the CD.

The setup program for the Acrobat Reader is in the directory C:\Acrobat3 or \English\Acrobat on the CD *Documentation and Drivers*.

### **3.7 Protective Functions**

Use passwords in Setup to prevent unauthorized persons from changing entries in Setup. For further information on Setup passwords, refer to chapter 2.14.3 in the manual.



# Expanding

# 4

## Chapter Overview

This chapter describes how to expand your device:

- Opening the unit
- Components visible after opening the unit
- Installing a memory expansion card
- Changing the backup battery
- Options.

## 4.1 Opening the Unit

### Prerequisites

The device is designed for easy maintenance so that any work that is necessary can be done quickly and at low cost.



#### Caution

Risk of damage to the unit!

Please note that only qualified personnel should be allowed to work on the open unit, so that the warranty on the device is not affected. Authorized Siemens maintenance and repair centers offer you a specialist maintenance service. The addresses are listed in section 7.3.

---



#### Caution

The electronic components on the printed-circuit boards are extremely sensitive to electrostatic discharge. Certain precautionary measures are therefore necessary when handling such components. These measures are explained in the guidelines for handling electrostatically-sensitive devices in chapter 1 (ESD Guidelines).

---

### Limitation of Liability

All technical specifications and licences apply only to expansion functions approved by Siemens.

No liability can be accepted for impairment of functions caused by the use of devices and components of other manufacturers.

All the modules and components are electrostatically sensitive. Please read the ESD guidelines at the end of this book carefully. The following symbol warns that electrostatically-sensitive modules are present.



## Before Opening the Unit (ESD guidelines)

Please observe the following rules before opening the unit:

- Please read the notes in the device manual. You can find the manual on the supplied CD *Documentation and Drivers*.
- Before you disconnect the power supply cable, discharge any electrostatic charge on your body. You can do this by touching the metal mounting plate for the interfaces on the rear panel of the unit.
- Discharge any electrostatic charge from tools that you are using.
- Wear a grounding wrist-strap if you are handling components.
- Leave components and modules in their packing until you are ready to install them.
- Disconnect the device from its power supply and remove the battery before plugging in or removing any modules or components.
- Only touch components and modules on their edges. Above all, do not touch the connecting pins and printed conductors.
- Never operate the device with the cover open.

## Tools

For undoing combi TORX, normal, or Phillips screws, use the appropriate screwdriver.

## 4.2 Installing Memory Expansion Cards

### Standard Memory

There are three ECC-compatible (Error Correction Code) slots for 64 and 72-bit DIMM memory expansion submodules on the motherboard. You can extend it up to a maximum of 768 MB. The device comes supplied with at least one filled memory slot.

The SDRAM module has to meet PC100 specifications or better. The memory chips on the module may not be larger than 128 Mbit.

If ECC submodules are fitted in combination with non-ECC submodules, the memory works without ECC backups or correction.

Organisation	Size in Mbytes	Type	Access Time/Frequency
8Mx64	64	SDRAM	PC100
16Mx64	128	SDRAM	PC100
32Mx64	256	SDRAM	PC100
8Mx72	64	SDRAM with ECC	PC100
16Mx72	128	SDRAM with ECC	PC100
32Mx72	256	SDRAM with ECC	PC100



#### Caution

Risk of damage!

The electronic components on the printed-circuit boards are highly sensitive to electrostatic discharge. When handling the boards or cards, you must follow the guidelines for electrostatically-sensitive components.

---

## Installing the DIMM Cards

Plug the DIMM cards in as follows:

1. Turn off the unit and unplug the power cable.
2. Open the unit as described in the manual.
3. Remove all inserted ISA modules.
4. Plug the card in vertically, making sure the cut-out on the connector end of the DIMM card engages properly.
5. Apply light pressure to the DIMM card until it clicks into place. You can easily remove the card again by releasing the clips.
6. Close the unit.



### Caution

Risk of damage!

The cards must sit firmly in their slots, otherwise they might be damaged. Plug the cards into their slots vertically before locking them in position.

---



### Caution

Risk of short-circuit!

Incorrect insertion of the DIMM card may result in destruction of the card and the mother board. Ensure that the contacts of the DIMM card and the receptacle are flush.

---

## Installation

The system recognizes the new memory configuration automatically. When you power up the unit, the base and extended memory information appears automatically on the screen.

## 4.3 Changing the Backup Battery

### Battery Power Supply for Real-Time Clock and Configuration

A backup battery (3.6 V lithium battery) powers the real-time clock even after the device is switched off. In addition to the time of day, all the information about the device system configuration is stored. If the backup battery fails or is removed, all this data is lost.

Because the clock uses very little power and the lithium battery has a high capacity, the battery can provide backup power for the real-time clock for several years. Thus the battery rarely needs to be changed.

### Battery too Low

If the battery voltage is too low, the current time and the configuration data stored are lost.

### Changing the Battery

In this case, you must replace the backup battery. The battery is located behind the power supply module on the mother board.

To change the battery, proceed as follows:

1. Turn off the unit, disconnect all cables.
2. Open the unit as described in chapter 1 in the manual.
3. Extract disk drive support and the bus module.
4. Now replace the backup battery, which is attached to the mother board by a short length of cable.
5. Reinstall the disk drive support and bus module and close the unit.



### Warning

Risk of severe personal injury or property damage, danger of release of harmful substances.

There may be a danger of explosion if the battery is not handled properly. Incorrect disposal of used batteries can cause the release of harmful substances. Do not throw a new or discharged battery into an open fire. Do not solder onto the cell container. Do not recharge the battery and do not open the battery by force.

The correct lithium battery can only be ordered from Siemens (order no.: W79084-E1003-B1). Return used lithium batteries to the manufacturer or recycler or dispose of them as special waste according to local regulations.

---

### Resetting SETUP

If you change the backup battery, you must reset the configuration of your device with the BIOS-SETUP program.

## 4.4 Closing the Unit

In order to close the unit, please follow the instructions in chapter 1 in the manual.

## 4.5 Options

### Authorized EIDE Disk Drives

Only ATA33-compatible drives can be used. The drives must display the CE or UR symbol. You can obtain further information from your service representative. With two drives you should only use a vibration resistant drive rack.

### Setting the Plug-in Jumpers

On the rear of the disk drive there are plug-in jumpers to set the operating mode. If there are jumper settings printed on your drive, these settings apply.

### Additional Hardware Expansions

You can add to the functionality of your SIMATIC PC by expanding the configuration of the hardware to fit your individual requirements. The following table shows the options offered by Siemens.

Please contact your Siemens sales representative for further options.

Option	Order Number
64 Mbyte memory expansion	6ES7791-0HR00-0XA0
128 Mbyte memory expansion	6ES7791-0HS00-0XA0
256 Mbyte memory expansion	6ES7791-0HT00-0XA0



#### Caution

Risk of damage to the unit!

Please note that only qualified personnel should be allowed to work on the open unit, so the warranty on the device is not affected. Authorized Siemens maintenance and repair centers offer you a specialist maintenance service.

## 4.6 Reinstallation of Software

You can reinstall the software from the Recovery CD supplied and the CD *Documentation and Drivers* if your software no longer functions correctly.

Directories and files will be restored to their original condition by doing this.

Please refer to the corresponding operating system manual for notes on hard disk partitioning and formatting.

### 4.6.1 Installation from the Recovery CD for Microsoft Windows NT

This CD contains encoded data which can only be transferred onto a SIEMENS SIMATIC PC.

Data transfer is carried out with the OEMSETUP.EXE program on the CD ROM or, after booting, from the CD ROM with the Recovery function.

After transferring the required data to the hard disk, the operating system can be installed using the Windows NT setup program.

#### Windows NT Installation Sequence

If a Windows operating system is already installed or if the PC has been started with a user created bootdisk, data transfer takes place using the program OEMSETUP.EXE. To do this, start the program OEMSETUP.EXE on the Recovery CD and continue the sequence as of point 5.

If there is no operating system installed, then please do the following:

1. Insert the Recovery CD and reboot the system.
2. To boot from the CD proceed as follows: When the BIOS message  
`Press <F2> to enter Setup`  
appears on the screen press the ESC key. After initialization a boot menu to select the boot options is displayed.
3. Select "ATAPI CD ROM Drive".
4. When "Microsoft Windows 98-Startup Menu" is displayed, select "1. Boot for CD-Recovery".
5. You have to acknowledge the "SIEMENS End User License Agreement" with the F8 function key. Pressing ESC allows you to decline the agreement and cancels the installation.
6. In the next screens you can select the components which are to be copied from the CD to the hard disk. Transfer of at least the folder "I386" is necessary for the Windows NT installation or setup.



7. Select the drive for data transfer. The selected drive is not the installation drive for Windows. For the Windows setup, you need an available disk space of approximately 300 MB on the installation drive for Windows.

---

**Note**

By default, drive C: is used for data transfer (Recovery).

Ensure that there is an available disk space of approximately 300 MB left on drive C: after the selected recovery data have been transferred.

---

8. Confirm the end message box.
9. Start the Windows setup program  
[D]:\1386\Winnt.exe  
[D] is the drive where the recovery data have been transferred.

You can find information on installing Windows NT in Part 2 Chapter 5 "Beginning Installation" in the manual "Introducing Microsoft Windows NT". Follow the instructions in the section "Starting from Setup".

#### **4.6.2 Installation of the operating system MS-DOS 6.22**

Install the operating system directly from the operating system diskette supplied. Proceed as follows:

1. Insert the diskette and reboot the device.
2. Follow the installation program instructions on the screen.

#### **4.6.3 Installation from the Recovery CD for Microsoft Windows 98**

This CD contains encoded data which can only be transferred onto a SIEMENS SIMATIC PC.

Data transfer is carried out with the OEMSETUP.EXE program on the CD ROM or, after booting, from the CD ROM with the Recovery function.

After transferring the required data to the hard disk, the operating system can be installed using the Windows 98 setup program.

##### **Windows 98 Installation Sequence**

If a Windows operating system is already installed or if the PC has been started with a user created bootdisk, the transfer of the data takes place using the program OEMSETUP.EXE. To do this, start the program OEMSETUP.EXE on the Recovery CD and continue the sequence as of point 5.

If there is no operating system installed, proceed as follows:

1. Insert the Recovery CD in the CD ROM drive and reboot the system.
2. To boot from the CD proceed as follows: When the BIOS message  
Press <F2> to enter Setup  
appears on the screen press the ESC key. After initialization a boot menu to select  
the boot options is displayed.
3. Select "ATAPI CD-ROM Drive".
4. When "Microsoft Windows 98-Startup Menu" is displayed, select "1. Boot for  
CD-Recovery".
5. You have to acknowledge the "SIEMENS End User License Agreement" with the  
F8 function key. Pressing ESC allows you to decline the agreement and cancels  
the installation.
6. In the next screens you can select the components which are to be transferred  
from the CD to the hard disk. Transfer of at least the folder "I386" is necessary for  
the Windows 98 installation or setup.
7. Select the drive for data transfer. The selected drive is not the installation drive for  
Windows. For the Windows setup, you need an available disk space of approxima-  
tely 250 MB on the installation drive for Windows.

---

**Note**

By default, drive C: is used for data transfer (Recovery).

Ensure that there is an available disk space of approximately 250 MB left on drive  
C: after the selected recovery data have been transferred.

---

8. Confirm the end message box.
9. Start the Windows setup program  
[D]:\I386\Winnt.exe  
[D] is the drive where the recovery data have been transferred.

For further information on the installation of Windows 98 refer to Chapter 2 "Installing  
Windows 98" in the "Getting Started Microsoft Windows 98" manual. Follow the  
instructions given in section "Performing a New Installation".

#### 4.6.4 Installation from the Recovery CD for Microsoft Windows 2000

This CD contains encoded data which can only be transferred to a SIEMENS SIMATIC PC.

Data transfer is carried out with the OEMSETUP.EXE program on the CD ROM, or after booting from the CD ROM with the recovery function.

After transferring the required data to the hard disk, the operating system can be installed using the Windows 2000 setup program.

##### Windows 2000 Installation Sequence

If a Windows operating system is already installed or if the PC has been started with a user created bootdisk, data transfer takes place using the program OEMSETUP.EXE. To do this, start the program OEMSETUP.EXE on the Recovery CD and continue the sequence as of point 5.

If there is no operating system installed, proceed as follows:

1. Insert the Recovery CD in the CD-ROM drive and reboot the system.
2. To boot from the CD proceed as follows: When the BIOS message  
Press <F2> to enter Setup  
appears on the screen press the ESC key. After initialization a boot menu to select the boot options is displayed.
3. Select "ATAPI CD ROM Drive".
4. When "Microsoft Windows 98-Startup Menu" is displayed, select "1. Boot for CD-Recovery".
5. You have to acknowledge the "SIEMENS End User License Agreement" with the F8 function key. Pressing ESC allows you to decline the agreement and cancels the installation.
6. In the next screens you can select the components which are to be transferred from the CD to the hard disk. Transfer of at least the folder "I386" is necessary for the Windows 2000 installation or setup.
7. Select the drive for data transfer. The selected drive is not the installation drive for Windows. For the Windows setup, you need an available disk space of approximately 500 MB on the installation drive for Windows.

---

##### Note

By default, drive C: is used for the data transfer (Recovery).

Ensure that there is an available disk space of approximately 500 MB left on drive C: after the selected recovery data have been transferred.

---

8. Confirm the end message box.
9. Start the Windows setup program  
[D]:\I386\Winnt.exe  
[D] is the drive where the recovery data have been transferred.

You can find information on installing Windows 2000 in Section 2 Chapter 5 "Beginning Installation" in the manual "Introducing Microsoft Windows 2000". Follow the instructions in the section "Starting from Setup".

#### 4.6.5 Setting the Language Selection for Windows 2000

The **Multilanguage File Installation (MUI)** allows you to set the Windows 2000 menus and dialogs to another language.

In order to install the MUI, run the program MUISETUP.EXE in the MUI folder on the Recovery CD and follow the screen dialog to install the desired languages.

The desired language for Windows 2000 menus and dialogs, as well as the keyboard layout can be set via the control panel with the dialog **Start > Settings > Control Panel > Regional Options > tab "General" > box "Menus and dialogs" and in the tab "Inputs", box "Keyboard layout"**.

Your device is set to English menus and dialogs and a US keyboard when delivered. You can set another language and keyboard via the control panel with the dialog **Start > Settings > Control Panel > Regional Options > tab "General", box "Menus and dialogs"> tab "Input locales", box "Input language"**.

#### 4.6.6 Installation of Drivers and Software

Install the driver from the CD *Documentation and Drivers* supplied. Proceed as follows:

1. Insert the CD.
2. Run *start.exe*  
Acrobat Reader is installed if necessary.
3. Navigate to the driver list (depending on language, operating system and device).  
The drivers are organized in the following structure: Operating system\Device Class\Type.
4. Install the desired driver in accordance with the entries in the driver list.

#### 4.7 Direct Key Module

Notes on installing and operating the direct key module can be found in the manual.

#### 4.8 Touch Screen Display

Notes on installing and operating the Touch Screen Display can be found in the manual.

---

##### Note

With device versions which have a touch screen display, the COM2 interface is assigned and is unavailable for other devices.

---

# Technical Specifications

# 5

## Chapter Overview

In this chapter you will find the technical specifications.

## 5.1 Technical Specifications

<b>General Information</b>						
Dimensions	Box PC 820: 385 x 295 x 164 mm (W x H x D) PC FI45 V2: 483 (19") x 310 (7HE) x 184 mm (W x H x D)					
Weight	Box PC 820: approx. 11 kg PC FI45 V2: approx. 15 kg					
Line voltage ( $U_N$ )	120 VAC (85 to 132 VAC), or 240 VAC (170 to 264 VAC) (does not switch automatically)					
Line voltage frequency	50/60 Hz (47 to 63 Hz)					
Brief voltage interruption acc. to NAMUR	max. 20 ms at $0.85 U_N$ (max. 10 events per hour; recovery time at least 1 second)					
Max. power consumption	220 W					
Max. current delivery (DC) *1	+5 V 20 A	+3.3 V 10 A	+12 V 8 A	-12 V 0.5 A	-5 V 0.5 A	aux. 5 V 0.05 A
Noise emission	< 55 dB (A) to DIN 45635					
Degree of protection	Box PC 820: IP20 PC FI45 V2: IP65, front (with drive cover closed)					
<b>Safety</b>						
Protection class	Protection class I to VDE 0106 T1: 1982 (IEC 536)					
Safety requirements	IEC 60950 corr. to EN 60950					
<b>Electromagnetic Compatibility (EMC)</b>						
Emitted interference	EN 55022 Class B, EN 61000-3-2 Class D and EN 61000-3-3					
Noise immunity: Line-fed interference on supply lines	+ - 2 kV (to IEC 61000-4-4; burst) + - 1 kV (to IEC 61000-4-5; surge symm) + - 2 kV (to IEC 61000-4-5; surge unsymm)					
Noise immunity on process, measuring, and control lines	+ - 1 kV (to IEC 61000-4-4; burst; length < 3m) + - 2 kV (to IEC 61000-4-4; burst; length > 3m) + - 1 kV (to IEC 61000-4-4; surge symm; length > 3m) + - 2 kV (to IEC 61000-4-4; surge unsymm; length > 3m)					
Noise immunity to discharges of static electricity	+ - 6 kV contact discharge (to IEC 61000-4-2) + - 8 kV air discharge (to IEC 61000-4-2)					
Noise immunity to high-frequency radiation	10 V/m 80-1000 Mhz, 80% AM (to IEC 61000-4-3) 10 V/m 900 Mhz, 50% ED (to IEC 61000-4-3)					
HF current	10 V 9 KHz-80 MHz (to IEC 61000-4-6)					
Magnetic field	30 A/m 50 Hz (to IEC 61000-4-8)					
<b>Ambient Conditions</b>						
Temperature - operation - storage/transport - gradient	Tested to IEC 60068-2-2, IEC 60068-2-1, IEC 60068-2-14, + 5°C to +45°C -20°C to +60°C Max. 10 degrees C/h (no condensation)					
Relative humidity - operation - storage/transport	Tested to IEC 60068-2-3, IEC 60068-2-30, IEC 60068-2-56 5 % to 85 % at 25°C (no condensation) 5 % to 95 % at 25°C (no condensation)					

<b>Mechanical Specifications</b>	
Vibration	Tested to IEC 60068-2-6
- operation	10 to 58 Hz: 0.075 mm, 58 to 500 Hz: 9.8 m/s <sup>2</sup>
- CD-ROM operation	10 to 38 Hz: 0.0375 mm, 38 to 500 Hz: 2 m/s <sup>2</sup>
- storage/transport	5 to 9 Hz: 3.5 mm, 9 to 500 Hz: 9.8 m/s <sup>2</sup>
Shock	Tested to IEC 60068-2-29
- operation	50 m/s <sup>2</sup> , 30 ms
- CD-ROM operation	50 m/s <sup>2</sup> , 11 ms
- storage/transport	250 m/s <sup>2</sup> , 6 ms
<b>Special Features</b>	
Quality assurance	to ISO 9001
<b>Motherboard</b>	
Processor	Type see page vii 1. Level Cache 16 Kbyte data memory 16 Kbyte command memory 2. Level Cache 512 Kbyte (PIII), 128 Kbyte (Celeron)
Internal processor cache	2 x 16 Kbyte first level, 512 Kbyte second level
Main memory	see page vii 768 Mbyte maximum
Chipset	Intel 440 BX (PAC) + PIIX4
Ethernet Controller	Intel 82559
Free expansion slots	1 ISA long, 1 ISA short (max. 165 mm) 2 PCI short (max. 165 mm), 1 x shared ISA/PCI long
– Max. admissible power consumption per ISA slot	5V 2A, 12V 0.3A, -12 V 0.05A, -5V 0.05A
– Max. admissible power consumption per PCI slot	5V 2A, 12V 0.5A, -12V 0.1A, -5V 0.05A
– In total (all slots):	5V 10A, 12V 3A, -12V 0.5A, -5V 0.1A must not be exceeded
<b>Drives</b>	
Floppy disk drive	3.5" (1.44 Mbytes)
Hard disk drive	3.5" EIDE, ATA 33, capacity see page vii
CD-ROM drive	20x EIDE, 650 Mbyte, overall height 12.7 mm
Interfaces	EIDE (primary and secondary, ATA 33)
<b>Graphics</b>	
Graphics chip	C&T, 69000
Graphics memory	2 Mbyte DRAM EDO integrated
Resolutions/frequencies/colors	CRT: to 1280 x 1024 / 75 Hz / 65535 colors
<b>LC Display (only for PC FI45)</b>	
Display type	active TFT, color
Display size	270 x 203 mm (13.3")
Picture resolution	1024 x 768 (XGA)
Colors	65536 (from 162.144)
Contrast	100:1
Brightness	150 cd/m <sup>2</sup>
Response time	30/50 ms (t <sub>rise</sub> /t <sub>fall</sub> )
Permitted fault locations	high/low level: < 12/25 spots green high level: < 5 spots

<b>Interfaces</b>	
COM1	Serial port 1 (V.24 / TTY), 25-pin sub D socket connector
COM2	Serial port 2 (V.24), 9-pin sub D socket connector
LPT1	Parallel port (standard and EPP mode) Interface for printer with parallel port
VGA	VGA interface, for external monitor
Keyboard	PS/2 keyboard interface Box PC 820: on the box PC FI45 V2: on the box and at the front
Mouse	PS/2 mouse port
Ethernet *	RJ45, 10Base T (100)
USB **	High current Type A Schnittstellen
<b>MPI/DP Interface, optically isolated *</b>	9-pin sub D socket connector, screw-type locking For SIMATIC MPI or PROFIBUS DP networks (CP 5611 compatible)
Data signalling rate	9.6 Kbps to 1.5 Mbps, software-selectable
Operating mode	Isolated*: Data lines A, B Control lines RTS_AS, RTS_PG 5V supply voltage (max. 90 mA)  Ground connection: MPI/DP connector cable shield
Physical interface	RS485, optically isolated
Memory address area	Resources are assigned via PCI-PNP
Interrupts	Resources are assigned via PCI-PNP
<b>Function Displays</b>	
Box PC 820	Floppy disk access (floppy disk drive on the side of the box) CD access (CD drive on the side of the box) Ethernet (on the side of the housing) green (link), yellow (activity)
PC FI45 V2	POWER Floppy drive MPI/DP RUN (in conjunction with SafeCard) TEMP (in conjunction with SafeCard) Floppy disk access (floppy disk drive behind the drive cover) CD access (CD drive behind the drive cover) Ethernet (on the side of the housing) green (link), yellow (activity)

\*1 Maximum of 150 W in total, with +5V and +3.3V the sum of 100W must not be exceeded. +12V can be loaded with 11A for a maximum of 10 seconds.

\* Optically isolated within the safety extra-low voltage circuit (SELV)

\*\* The USB-connectors are only supported by Windows 98 at the present time. In addition, the BIOS setup can be controlled by a USB keyboard.



# Error Diagnostics

# 6

## Chapter Overview

This chapter provides you with tips on how to localize and troubleshoot frequently occurring problems.

- Correcting malfunctions
- Error messages
- Self-test prior to booting
- Refer to your operating system documentation for operating system error messages.

---

### Note

Please observe the safety notes in chapters 1 and 2 when connecting or disconnecting cables.

---

## 6.1 The PC Does not React

### Error Display

The PC does not show any reaction at all when it is switched on. The power LED does not light up.

### Cause

The power supply is faulty.

### Remedy

Proceed as follows:

- Check whether the power switch at the power supply is in the ON position.
- Check whether the power supply cable is connected.
- Check whether the power supply connector is connected correctly.
- Switch off the PC and then switch on again.

---

### Note

If no LED lights up on the system unit after you have carried out these checks and measures, notify your technical support team (Chapter 7.3).

---

## 6.2 Problems When Using Modules from Other Manufacturers

### Error Display

The PC crashes during power-up.

### Cause

The following causes are possible:

- Double assignment of I/O addresses
- Double assignment of hardware interrupts and/or DMA channels
- Signal frequencies or signal levels are not met
- Different connector assignments

## Remedy

Check your computer configuration.

- If the computer configuration is the same as when your PC was delivered, please contact your technical support team (Chapter 7.3).
- If the computer configuration has changed, re-establish the configuration you had when your PC was delivered. Remove any modules from other manufacturers. Perform a complete restart on your PC.
  - If the PC still crashes, you must contact your technical support team.
  - If the error no longer occurs, the module you used from another manufacturer was the cause of the fault. Replace this module with a Siemens module, or contact the module supplier.

## 6.3 The Monitor Remains Dark

### Cause and Remedy

The following causes are possible:

#### **The monitor has been switched off.**

- Switch on the monitor.

#### **The monitor is in “powersave” mode.**

- Press any key on the keyboard.

#### **The brightness button has been set to dark.**

- Set the screen’s brightness button to obtain more light. Refer to the operator’s guide for the monitor for more detailed information.

#### **The power supply cable or the screen cable is not connected.**

- Switch off the monitor and the system unit.
- Check whether the power supply cable has been connected correctly to the monitor and to the system unit or to the grounding outlet.
- Check whether the monitor cable has been connected correctly to the system unit and to the screen (if a connector is present).
- Switch on the monitor and the system unit.

#### **BIOS Setup is set to LCD only**

- Press the insert key during bootup (simultaneous is forced).
- Reset the BIOS Setup correctly.

---

### Note

If the monitor screen still remains dark after these checks and measures have been carried out, please contact your technical support team (Chapter 7).

---

## 6.4 The Screen Display Does not Appear or Drifts

### Cause and Remedy

Either the incorrect line frequency and/or the incorrect resolution is set for the screen or for the user program.

- Stop the user program. If the error still occurs after you have ended the program, switch off the monitor. After at least three seconds, switch on the monitor again.
- Adjust the relevant entries for the monitor in the *CONFIG.SYS* file (on the hard drive).
- Correct the settings for the monitor and graphics in your user program.
- Select the correct screen driver for your user program.

## 6.5 No Mouse Pointer Appears on the Screen

### Cause and Remedy

The mouse pointer may not appear for the following reasons:

#### **The mouse, Touchpad, or Touchscreen driver is not loaded**

- Check whether the driver is correctly installed. Check whether the mouse pointer is present when you start your user program. Refer to the manuals for the mouse or user program to obtain detailed information.

#### **The mouse is not connected**

- Switch off your PC.
- Check whether the mouse cable is connected to the system unit correctly. If you use an adapter or an extension cord for the mouse cable, also check their plug-in connections.
- Switch on your PC.

---

#### **Note**

If the mouse pointer still does not appear on the screen after you have performed these checks and measures, please contact your technical support team (Chapter 7.3).

---

#### **BIOS Setup is set to Internal (Mouse)**

- Set the BIOS Setup to Auto.

#### **BIOS Setup is set to External (Touchpad)**

- Set the BIOS Setup to Auto.

## **6.6 The Clock Time and/or the Date in Your PC Is Incorrect**

### **Remedy**

Set the clock time and the date in the setup menu.

Press <F2> to call setup when booting the computer.

---

### **Note**

The battery is dead if the clock time and the date are still incorrect after you switch off your PC and switch it back on again. In this case, please contact your technical support team (see chapter 7.3).

---

## **6.7 Rebooting Your Hard Drive (Data Deleted)**

See Chapter 4.6.

## **6.8 USB-Device doesn't function**

The USB interface is not recognized by the operating system. It is only supported by Windows 98 and Windows 2000 at the present time. In addition the BIOS setup can be controlled by a USB keyboard.

## 6.9 An Error Message Appears on the Screen

### Error Messages

The following table describes the error messages that the BIOS system outputs. Error messages the operating system or program outputs are described in the manuals for these programs. Press <F2> to call Setup when booting the computer.

Error Message on the Screen	Meaning/Suggestion
Address	Plug & play problem Contact your technical support team.
Combination not supported	Plug & play problem Contact your technical support team.
I/O device IRQ conflict	Plug & play problem Contact your technical support team.
Invalid system configuration data	Plug & play problem Set the RESET CONF...DATA option in the Setup. Contact your technical support team.
Allocation error for	Plug & play problem Please undo the last hardware change. Contact your technical support team.
System battery is dead Replace and run SETUP	The battery on the CPU module is defective or dead. Contact your technical support team.
System CMOS checksum bad Run SETUP	Call up SETUP and save. If this message appears during each power up, contact your technical support team.
Incorrect drive A type Run SETUP	Check the SETUP entries for drive A.
Incorrect drive B type Run SETUP	Check the SETUP entries for drive B.
Diskette drive A error	Error accessing drive A. Contact your technical support team.
Diskette drive B error	Error accessing drive B. Contact your technical support team.
Failure fixed disk	Error accessing the hard drive. Contact your technical support team.
Keyboard error	Check whether the keyboard is connected correctly.
Stuck key	Check whether a key on the keyboard is stuck.
K system RAM failed at offset:	Memory error. Contact your technical support team.
K shadow RAM failed at offset:	Memory error. Contact your technical support team.
K extended RAM failed at offset:	Memory error. Contact your technical support team.
Failing bits:	Memory error. Contact your technical support team.
Operating system not found	Possible causes: No operating system present Incorrect drive addressed (diskette in drive A/B) Incorrect active boot partition Incorrect entries in SETUP for the BOOT drive
Previous boot incomplete Default configuration used	Four times abort of the previous BOOT procedure, for example, due to a power failure. Check the hardware settings and the SETUP.
System cache error Cache disabled	Error in the CPU's cache module. Contact your technical support team.
Monitor type does not match CMOS Run SETUP	The monitor does not match the SETUP entries. Adapt the SETUP entries to the monitor.
System timer error	Hardware error. Contact your technical support team.
Real-time clock error	Clock chip error Contact your technical support team.
Keyboard controller error	Keyboard error Contact your technical support team.

## 6.10 Self-Test Prior to Booting

When the device is powered up, it runs a self-test (POST = Power On Self-Test). If the POST detects a fault, it outputs the sequence of beeps (beep code) assigned for the fault. Each beep code consists of 2 x 2 sequences.

In addition, the individual self-test steps are output at I/O port 80h.

Conversion table for the beep codes to hexadecimal representation:

Beeps		Hex Code
B	B	0
B	BB	1
B	BBB	2
B	BBBB	3
BB	B	4
BB	BB	5
BB	BBB	6
BB	BBBB	7
BBB	B	8
BBB	BB	9
BBB	BBB	A
BBB	BBBB	B
BBBB	B	C
BBBB	BB	D
BBBB	BBB	E
BBBB	BBBB	F

### Example:

B	BBBB	BB	BBB	Beeps
3		6		Hexadecimal code
Check shutdown code				Meaning

The POST codes in order of occurrence:

Display (hex)	Meaning	Description
02	TP_VERIFY_REAL	Test whether the CPU is in real mode
1C	TP_RESET_PIC	Reset the interrupt controller
12	TP_RESTORE_CRO	Restore the controller register
13	TP_PCI_BM_RESET	Reset the PCI bus master
36	TP_CHK_SUTDOWN	Check the shutdown code
24	TP_SET_HUGE_ES	Switch the ES to special mode
03	TP_DISABLE_NMI	Switch off the NMI
0A	TP_CPU_INIT	Initialize the CPU
04	TP_GET_CPU_TYPE	Determine the CPU type
AE	TP_CLEAR_BOOT	Edit the boot flag
06	TP_HW_INIT	Initialize the main hardware
18	TP_TIMER_INIT	Initialize the timer
08	TP_CS_INIT	Initialize the chip set
C4	TP_PEM_SIZER_INIT	Reset system error
0E	TP_IO_INIT	Initialize IO
0C	TP_CACHE_INIT	Initialize the cache
16	TP_CHECKSUM	EPROM checksum test
28	TP_SIZE_RAM	Determine the RAM size
3A	TP_CACHE_AUTO	Determine the cache size
2A	TP_ZERO_BASE	Set 512k base RAM to 0
2C	TP_ADDR_TEST	Test the base RAM address cables
2E	TP_BASERAML	Check the 1.64k base RAM
38	TP_SYS_SHADOW	BIOS shadow
20	TP_REFRESH	Refresh circuit test
29	TP_PMM_INIT	Initialize the post memory manager
33	TP_PDM_INIT	Initialize the dispatch manager
C1	TP_7xx_INIT	Initialize the PG 7xx I/Os
09	TP_SET_IN_POST	Start power ON self-test
0A	TP_CPU_INIT	Initialize the CPU
0B	TP_CPU_CACHE_ON	Switch on the cache
0F	TP_FDISK_INIT	Initialize the hard disk
10	TP_PM_INIT	Initialize the power management
14	TP_8742_INIT	Initialize the 8742 circuit
1A	TP_DMA_INIT	Initialize the DMA circuits
1C	TP_RESET_PIC	Reset the interrupt controller



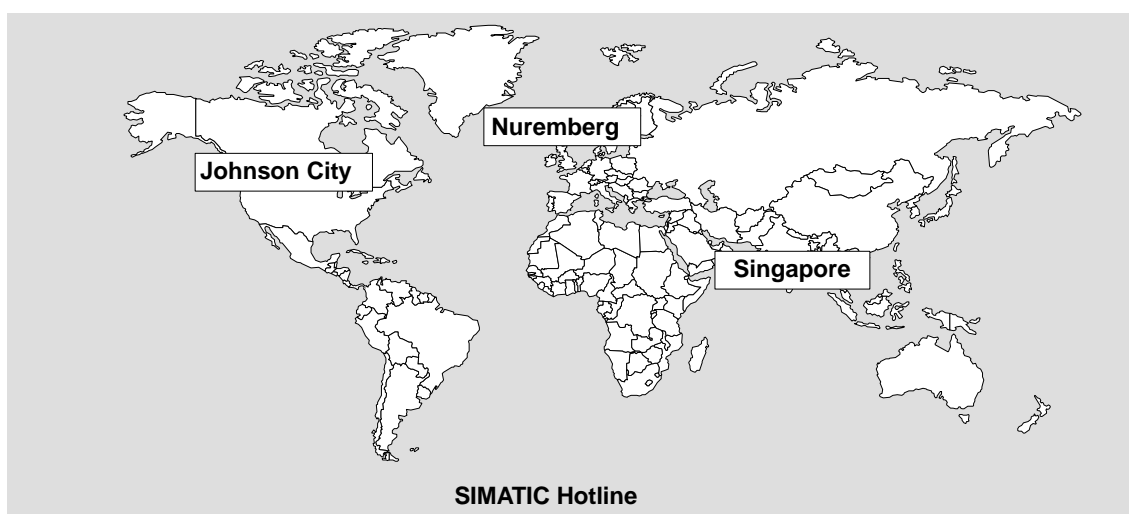
Display (hex)	Meaning	Description
32	TP_COMPUTE_SPEED	Determine the clock pulse speed
C1	TP_740_INIT	Initialize the PG 740 I/Os
34	TP_CMOS_TEST	Test the CMOS RAM
3C	TP_ADV_CS_CONFIG	Configure the advanced chip set
42	TP_VECTOR_INIT	Initialize the interrupt vectors
46	TP_COPYRIGHT	Test the copyright
49	TP_PCI_INIT	Initialize the PCI interface
48	TP_CONFIG	Check the configuration
4A	TP_VIDEO	Initialize the video interface
4C	TP_VID_SHADOW	Copy the video BIOS to RAM
24	TP_SET_HUGE_ES	Switch the ES to special mode
22	TP_8742_TEST	Test circuit 8742
52	TP_KB_TEST	Keyboard available?
54	TP_KEY_CLICK	Switch the keyboard click on/off
76	TP_KEYBOARD	Check the keyboard
58	TP_HOT_INT	Test for unexpected interrupts
4B	TP_QUIETBOOT_START	Switch off any boot messages
4E	TP_CR_DISPLAY	Display the copyright notice
50	TP_CPU_DISPLAY	Display the CPU type
5A	TP_DISPLAY_F2	Display the F2 message for "SETUP"
5B	TP_CPU_CACHE_OFF	Switch off the cache if applicable (SETUP setting)
5C	TP_MEMORY_TEST	Test the system memory
60	TP_EXT_MEMORY	Test the extended memory
62	TP_EXT_ADDR	Test the A20 address line
64	TP_USERPATCH1	Area for own initializations
66	TP_CACHE_ADVNCD	Determine and enable the cache size
68	TP_CACHE_CONFIG	Configure and test the cache
6A	TP_DISP_CACHE	Display the cache configuration
6C	TP_DISP_SHADOWS	Configuration and size of the shadow Display RAM
6E	TP_DISP_NONDISP	Display non-disposable segment
70	TP_ERROR_MSGS	Display post error
72	TP_TEST_CONFIG	Check SETUP irregularities
7C	TP_HW_INTS	Set the IRQ vectors
7E	TP_COPROC	Check whether the CO processor is present
96	TP_CLEAR_HUGE_ES	Switch the ES back

Display (hex)	Meaning	Description
80	TP_IO_BEFORE	Disable IO circuits
88	TP_BIOS_INIT	Initialize the BIOS data area
8A	TP_INIT_EXT_BDA	Initialize the external BIOS data area
85	TP_PCI_PCC	Determine the PCI circuits
82	TP_RS232	Determine the serial interfaces
84	TP_LPT	Determine the parallel interface
86	TP_IO_AFTER	Re-enable the IO circuits
83	TP_FDISK_CFG_IDE_CTRLR	Configure the IDE controller
89	TP_ENABLE_NMI	Enable the NMI
8C	TP_FLOPPY	Initialize the floppy controller
90	TP_FDISK	Initialize the hard disk controller
8B	TP_MOUSE	Test the internal mouse interface
95	TP_CD	Test the CP
92	TP_USERPATCH2	Area for own initializations
98	TP_ROM_SCAN	Search for BIOS expansions
69	TP_PM_SETUP	Initialize the power management
9E	TP_IRQS	Enable the hardware IRQ
A0	TP_TIME_OF_DAY	Set the clock time and date
A2	TP_KEYLOCK_TEST	Preset the keylock
C2	TP_PEM_LOCK	Stop the error manager
C3	TP_PEM_DISPLAY	Display any possible errors
A8	TP_ERASE_F2	Delete the F2 message
AA	TP_SCAN_FOR_F2	Check whether to activate setup
AC	TP_SETUP_CHEK	Output any F1/F2 message
AE	TP_CLEAR_BOOT	Cancel the self-test flag
B0	TP_ERROR_CHECK	Check for any possible errors
B2	TP_POST_DONE	End of the self-test
BE	TP_CLEAR_SCREEN	Clear the screen
B6	TP_PASSWORD	Password query (option)
BC	TP_PARITY	Cancel the parity memory bit
BD	TP_BOOT_MENU	Display the boot menu (option)
B9	TP_PREPARE_BOOT	Prepare the boot
C0	TP_INT19	Boot via Interrupt 19
00		Message after startup is complete

## Hotline Services

### 7.1 Customer Support, Technical Support

Open round the clock, worldwide:



<p><b>Worldwide (Nuremberg)</b>  <b>Technical Support</b>            (FreeContact)            Local time: Mon.-Fri. 7:00 to 17:00            Phone: +49 (180) 5050-222            Fax: +49 (180) 5050-223            E-Mail: techsupport@ad.siemens.de            GMT: +1:00</p>	<p><b>Worldwide (Nuremberg)</b>  <b>Technical Support</b>            (fee based, only with SIMATIC Card)            Local time: Mon.-Fri. 0:00 to 24:00            Phone: +49 (911) 895-7777            Fax: +49 (911) 895-7001            GMT: +01:00</p>	
<p><b>Europe / Africa (Nuremberg)</b>  <b>Authorization</b>            Local time: Mon.-Fri. 7:00 to 17:00            Phone: +49 (911) 895-7200            Fax: +49 (911) 895-7201            E-Mail: authorization@nbgm.siemens.de            GMT: +1:00</p>	<p><b>America (Johnson City)</b>  <b>Technical Support and Authorization</b>            Local time: Mon.-Fri. 8:00 to 19:00            Phone: +1 423 461-2522            Fax: +1 423 461-2289            E-Mail: simatic.hotline@sea.siemens.com            GMT: -5:00</p>	<p><b>Asia / Australia (Singapore)</b>  <b>Technical Support and Authorization</b>            Local time: Mon.-Fri. 8:30 to 17:30            Phone: +65 740-7000            Fax: +65 740-7001            E-Mail: simatic.hotline@sae.siemens.com.sg            GMT: +8:00</p>
<p>The languages of the SIMATIC Hotlines are generally German and English, in addition, French, Italian and Spanish are spoken on the authorization hotline.</p>		

## 7.2 SIMATIC Customer Support Online Services

The SIMATIC Customer Support team offers you substantial additional information about SIMATIC products via its online services:

- General current information can be obtained from:
  - the **Internet** under <http://www.ad.siemens.de/simatic>
- Current product information leaflets and downloads which you may find useful are available:
  - in the **Internet** under <http://www.ad.siemens.de/simatic-cs>
  - via the **Bulletin Board System** (BBS) in Nuremberg (*SIMATIC Customer Support Mailbox*) under the number +49 (911) 895-7100.  
To access the mailbox, use a modem with up to V.34 (28.8 Kbps) with parameters set as follows: 8, N, 1, ANSI; or dial in via ISDN (x.75, 64 Kbps).
- You can find your local customer service representative for Automation & Drives in our customer service representative data bank:
  - in the **Internet** under <http://www.ad.siemens.de/partner>

### 7.3 Regional Repair Centers

Region	Phone	Fax
Augsburg	+49 (821)2595 599	+49 (821)2595 546
Berlin	+49 (30)386 34926	+49 (30)386 34933
Bielefeld	+49 (521)291 323	+49 (521)291 538
Bremen	+49 (421)364 2093	+49 (421)364 2107
Chemnitz	+49 (371)475 3860	+49 (371)475 3888
Erlangen	+49 (9131)7 31048	+49 (9131)7 35263
Essen	+49 (201)816 1580	+49 (201)816 1522
Frankfurt	+49 (69)797 7358	+49 (69)797 7131
Hamburg	+49 (40)2889 4230	+49 (40)2889 4430
Hannover-Laatzten	+49 (511)877 2241	+49 (511)877 1320
Karlsruhe	+49 (721)595 4183	+49 (721)595 6667
Cologne-Ossendorf	+49 (221)576 6633	+49 (221)576 6630
Langen	+49 (69)797 5608	+49 (69)797 5567
Leipzig	+49 (341)210 2049	+49 (341)210 2049
Mannheim	+49 (621)456 1328	+49 (621)456 1460
Munich	+49 (89)9221 6213	+49 (89)9221 6201
Nuremberg	+49 (911)654 6127	+49 (911)654 7630
Saarbrücken	+49 (681)386 2598	+49 (681)386 2397
Stuttgart Weilimdorf	+49 (711)137 6001	+49 (711)137 6210

Country	Phone	Fax
Argentina	+54 (1) 3408400	+54 (1) 3408400 3163
Australia	+61 (3) 9420 7274	+61 (3) 9420 7500
Belgium	+32 (2) 536 2905	+32 (2) 536 2880
Brazil	+55 (11) 7947 1999 ext. 3013	+55 (11) 7947 1888
China	+86 (21) 6213 2050 ext. 301	+86 (21) 6213 5538
Denmark	+45 (7640) 5151	+45 (7640) 5143
Finland	+358 (9) 5105 3303	+358 (9) 5105 3661
France	+33 (1) 49 22 31 60	+33 (1) 49 22 29 42
Great Britain	+44 (161) 446 5760	+44 (161) 446 5772
India	+91 22 7577115	+91 22 7577106
Italy	+39 (02) 6676 3490	
Japan	+81 (3) 5423 8502	+81 (3) 5423 8737
Mexico	+52 (5) 328 2456	+52 (5) 328 2058
Netherlands	+31 (70) 333 3858	+31 (70) 333 3878
Austria	+43 (1) 1707 29886	+43 (1) 1707 53730
Poland	+48 (22) 670 9166	+48 (22) 670 9169
Portugal	+351 (1) 75 73234	+351 (1) 75 89333
Schweden	+46 (8) 728 1462	+46 (8) 728 1703
Switzerland	+41 (1) 749 1304	+41 (1) 749 1284
Singapore	+65 (740) 7150	+65 (740) 7196
Spain	+34 (91) 514 8400	+34 (91) 514 9217
South Africa	+27 (12) 309 0149	+27 (12) 309 0142
South Korea	+82 (2) 3420 4880	+82 (2) 3420 4889
Taiwan	+886 (2) 2376 1849	+886 (2) 2378 8958
Thailand	+66 (2) 716 4609	+66 (2) 716 4601
USA	+1 (423) 461 2497	+1 (423) 461 2094

**Note**

In countries not listed above, please contact your local service representative. He will arrange for your repairs to be carried out.