

# VME64x Tower System User's Manual



**Product No.:**  
**10836-045**

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R1.0	November 12, 2006	Initial Release
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Schroff GmbH

D-75334 Straubenhardt, Germany

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# 1 Safety

## 1.1 Intended Application

The VME64x tower system, described in this manual, is intended as a platform for a microcomputer system based on the VME bus system (VME (VITA 1-1994) and VME64x (VITA 1.1-1997)).

The VME64x tower systems are designed for protection class IP 20 and can be used only in the resp. environments.

VME64x tower systems are not end-products, so there is no valid approval for this unit. In order to enable stand-alone functionality, additional elements are required. An operational system is achieved only by way of appropriate VME or VME64x boards.

The completion and final testing of the units have been carried out, or at least supervised, by qualified technicians. These instructions are directed exclusively to these qualified technicians i.e. engineers, trained and qualified electricians etc.




Make sure that:

- the assembled unit complies with the safety regulations currently applicable in the country it is going to be used.
- the overall unit complies with all other regulations and specifications at the place and country of use, e.g. interference limits, approval by the telecommunications authorities.


## 1.2 Safety Instructions

The intended audience of this User's Manual is system integrators and hardware/software engineers.

## 1.3 Safety Symbols used in this document

	<p><b>Hazardous voltage!</b> <i>This is the electrical hazard symbol. It indicates that there are dangerous voltages inside the Shelf.</i></p>
	<p><b>Caution!</b> <i>This is the user caution symbol. It indicates a condition where damage of the equipment or injury of the service personnel could occur. To reduce the risk of damage or injury, follow all steps or procedures as instructed.</i></p>
	<p><b>Danger of electrostatic discharge!</b> <i>The Shelf contains static sensitive devices. To prevent static damage you must wear an ESD wrist strap.</i></p>

## 1.4 General Safety Precautions

	<p><b>Warning!</b> <i>Voltages over 60 VDC can be present in this equipment. This equipment is intended to be accessed, to be installed and maintained by qualified and trained service personnel only. This equipment is designed in accordance with protection class 1! It must therefore be operated only with protective GND/earth connection!</i></p>
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- Service personnel must know the necessary electrical safety, wiring and connection practices for installing this equipment.
- Install this equipment only in compliance with local and national electrical codes.

## 1.5 References and Architecture Specifications

- User Manual VME64x Backplanes  
Order no.: 73972-103
- Short Form User Manual VME64x Backplanes  
Order no.: 73972-128
- User Manual Fan Control Module (FCM)  
Order no.: 73972-083
- User Manual Power Supply  
Order no.: 73972-077
- User Manual Power Backplane  
Order no.: 73972-072

For more information see the catalogue „Electronic Packaging“ and at [www.schroff.biz](http://www.schroff.biz)

## 2 Product Definition

The Schroff VME64x tower system consists of:

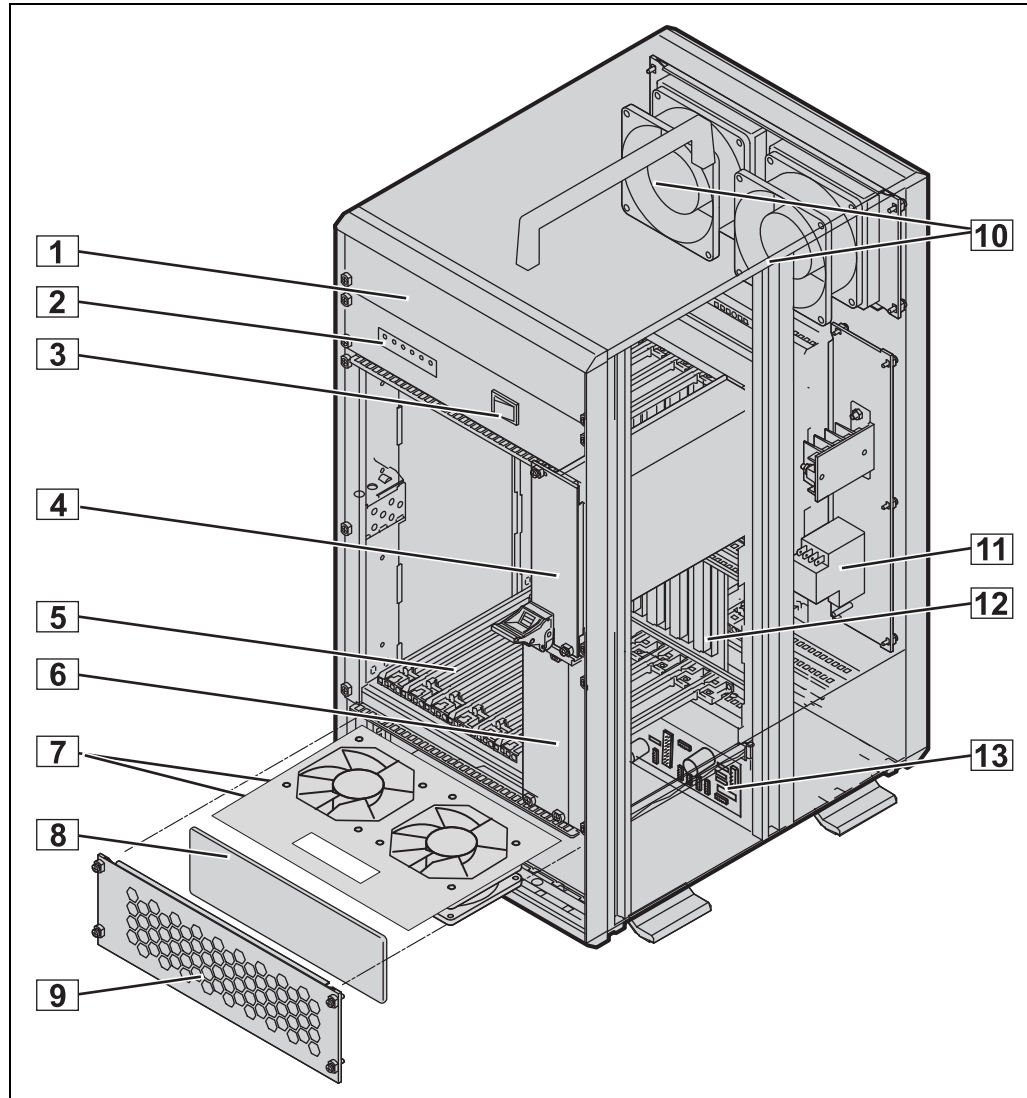
- A shielded subrack with front assembly area for 6 U front boards according to VME64x Standard (VITA 1.1-1997) and rear assembly area for Rear I/O boards
- A 7 slot VME64x (VITA 1.1-1997) Backplane
- A Power Backplane with 2 P47 connectors for 2 19" plug-in power supplies
- A 19" plug-in power supply with wide range input
- Speed controlled fans for cooling the boards
- Fan Control Module (FCM) for fan monitoring/controlling
- Display module
- Mains/line switch
- AC mains/line module with IEC320-C14 connector, line filter and fuses

The fans are assembled at the rear panel, one power supply is plugged-in right to the card cage.



## 2.1 Mechanical Overview

Figure 1: Mechanical Overview



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- |   |                            |    |                                       |
|---|----------------------------|----|---------------------------------------|
| 1 | Front panel 5 U / 8 HP     | 8  | Air Filter                            |
| 2 | Display Module             | 9  | Front panel, perforated               |
| 3 | AC Switch                  | 10 | Rear Fans                             |
| 4 | 19" Power Supply           | 11 | AC Connector (IEC320-C14) with filter |
| 5 | Card Cage with Guide Rails | 12 | VME64x Backplane                      |
| 6 | Front panel 3 HE / 8 TE    | 13 | Fan Control Module (FCM)              |
| 7 | Front fans                 |    |                                       |

## 2.2 Tower System

The VME64x Tower System system based on the Schroff europacPro subrack in a ratiopacPro chassis with EMC shielding. The front card cage provides space for the installation of 7 VME64x Boards (6 U, 4 HP, 160 mm deep), the rear card cage provides space for the installation of 7 Rear I/O Boards (6 U, 4 HP, 80 mm deep).

The lower guide rails are fitted with ESD clips.

Two slots for 19" plug-in power supplies are located right to the card cage.

## 2.3 VME64x Backplane

The 6 U Backplane is compliant to:

- VITA 1.1-1997
- VITA 38 System management for VME



The Tower System has a 7 slot Backplane without P0 connectors as standard. You can customize your system with different Backplanes.

For more information see the Backplane's User Manual, Order No.: 73972-103/-128, in the catalogue and at [www.schroff.biz](http://www.schroff.biz)



*1 Slot = 4 HP = 20,32 mm*

## 2.4 Power Supply

	<p><b>Hazardous voltage!</b> <i>Parts of the power supply may be exposed with hazardous voltage. Always remove mains/line connector before carry out any assembly work.</i></p>
	<p><b>Caution!</b> <i>Your system has not been provided with a AC power cable. Purchase a AC power cable that is approved for use in your country. The AC power cable must be rated for the product and for the voltage and current marked on the product's electrical ratings label. The voltage and current rating of the cable should be greater than the ratings marked on the product.</i></p>

The Tower System has a 19" AC power supply with wide range input.

The power supply is plugged-in in one of two dedicated slots at the right side of the Tower System. The power supply contacts via a P47 connector to a Power Backplane.

The power input is provided by a AC mains/line module with IEC 320-C14 connector, integrated mains/line fuses and line filter.

A mains/line switch is located at the front side.

The maximum fuse values is 8 A.


**Figure 2: Fuses**




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1 Fuse

2 AC Connector

	<p><b>Warning!</b> <i>The fuse value has been determined in factory for the maximum power delivered by the power supply. The fuse value must be changed to the actual current of the complete equipped system.</i></p>
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## 2.4.1 Grounding

	<p><b>Caution!</b></p> <p><i>The unit is designed in accordance with protection class 1! It must therefore be operated with protective earth/GND connection. Use only a three conductor AC power cable with a protective earth conductor that meets the IEC safety standards!</i></p>
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## 2.4.2 Power Supply

Figure 3: Power Supply



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Table 1: Data AC Power Supply

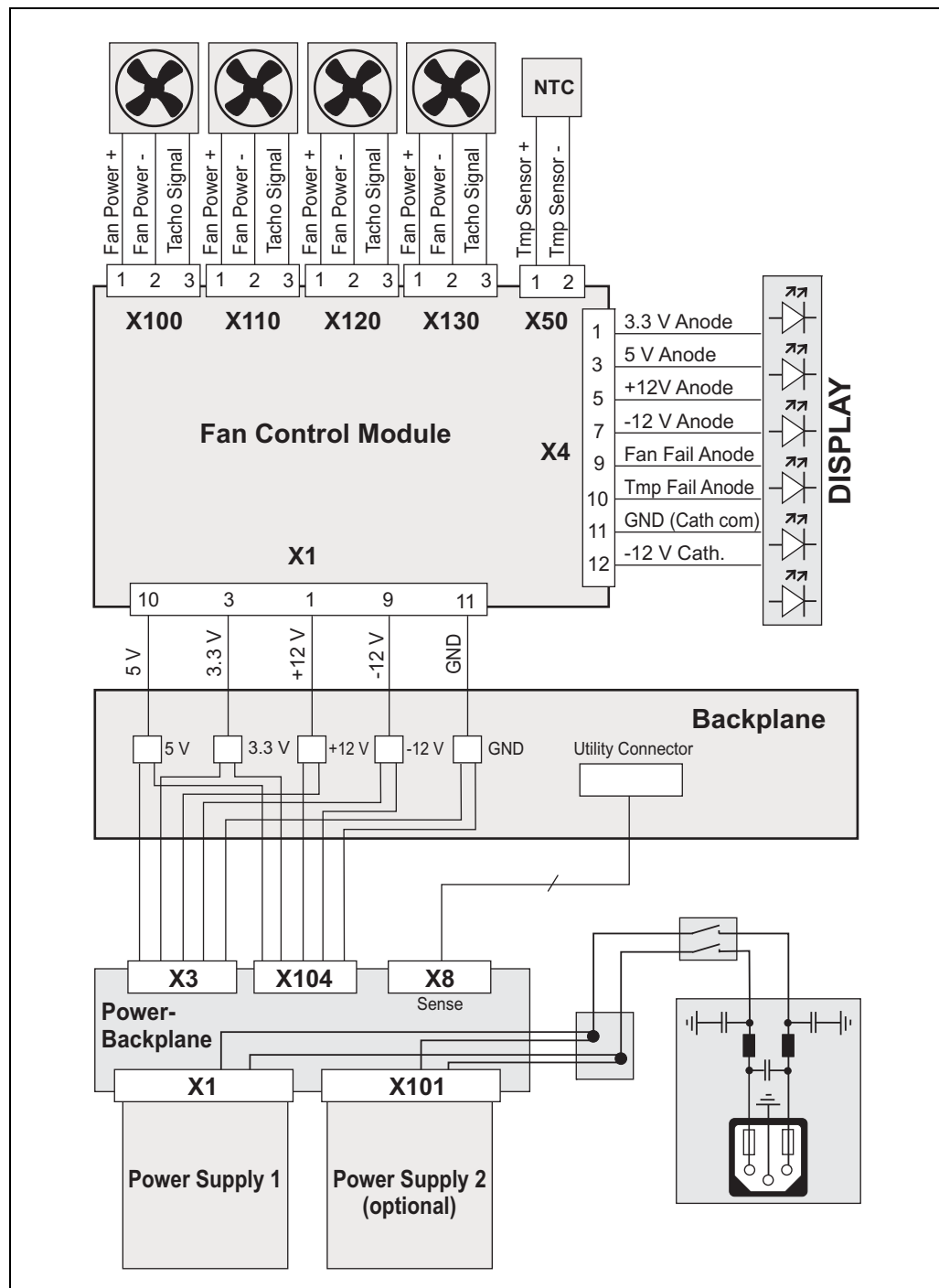
Input voltage nominal	100 - 240 VAC
Mains Frequency	50 / 60 Hz
Output (max.)	250 W
Output voltages	3.3 V - 40 A 5.0 V - 40 A 12.0 V - 5.5 A -12.0 V - 2 A
Ripple	< 1 %
Dynamic response	< 1 % or 60 mV
Recovery time to within 1%	< 300 µsec
Overvoltage protection	for all voltages 120 – 130 % U > 5 V
Overcurrent protection	105 – 130 % of rated output current
Hold-up time	>= 20 ms

### 2.4.3 Power Backplane

The Power Backplane is located right of the VME64x Backplane. The Power Backplane provides 2 P47 connectors for the 19" power supply and further connectors to distribute the power to the VME64x Backplane and to an optional HDD.

Further information you can find in the user manual, order no.: 73972-072

Figure 4: Wiring Diagram



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## 2.5 Thermals

The front boards are cooled by forced air convection through 4 speed controlled 24 VDC axial fans (each fan 125 m<sup>3</sup>/h (75 cfm)).

Two fans are assembled at the rear panel, two fans are located in the bottom air plenum.

The air enters the subrack at the lower front into the bottom air plenum and turns 90° upward. As the air passes across the hot components on the Front Boards, heat is carried away by forced convection. The air exits the Subrack at the top, is drawn into the upper plenum, turns 90°, and is exhausted out the rear of the subrack by fans.

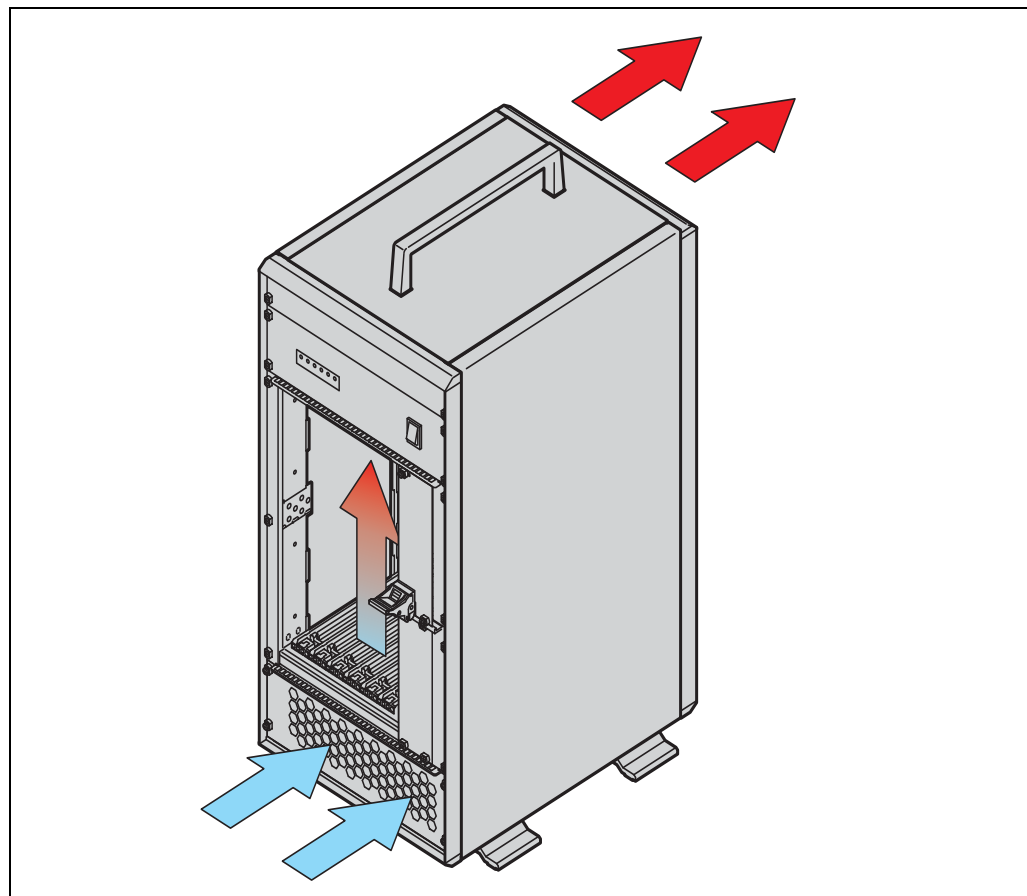
The fan speed is controlled by the Fan Control Module (FCM) depending on the exhaust temperature. The NTC temperature sensor is located above the card cage.



**Caution!**

*To maintain proper airflow, all open slots must be covered with filler panels. The filler panel should include an airflow baffle that extends to backplane.*

**Figure 5: Airflow**



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## 2.6 Fan Control Module (FCM)

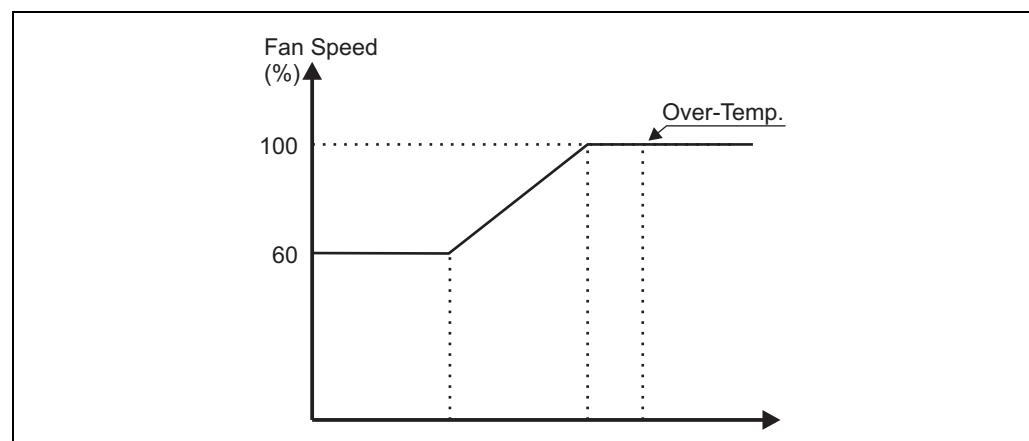
The Fan Control Module (FCM):

- Monitors and controls up to four fans
- Monitors the signals from up to four temperature sensors
- Controls the Display Module
- Speed up the fans in case of a failure of one fan
- Is able to communicate with the optional Chassis Monitoring Module (CMM)

Up to four NTC temperature sensors can be connected to the FCM. The highest temperature level is the reference for the fan speed. If one or more sensors exceed 60° C the output for the temperature fail LED and a digital output are activated. Since the fan speed is temperature controlled by the FCM, the fans rotate with the lowest speed possible. Lower speeds reduce acoustic noise and increase the longevity of the fans.

The FCM also controls a Display Module. 4 green LEDs signal the 4 VME64x voltages, two red LEDs signal over-temperature and fan fail events.

Figure 6: Diagram fan speed/temperature

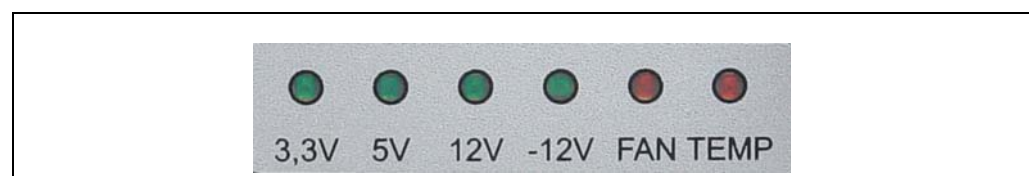


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For more information see the FCM's User Manual, Order No.: 73972-083 and at [www.schroff.biz](http://www.schroff.biz)

## 2.7 Display Module

Figure 7: Display Module



The Display Module is located at the upper front side of the subrack. 4 green LEDs signal the 4 VME64x voltages, two red LEDs signal over-temperature and fan fail events.

The Display Module is controlled by the FCM.

## 3 Installation

### 3.1 Unpacking



**Caution!**

*When opening the shipping carton, use caution to avoid damaging the system.*

Consider the following when unpacking and storing the system:

- Leave the system packed until it is needed for immediate installation.
- After unpacking the system, save and store the packaging material in case the system must be returned.

If the packaging is damaged and possible system damage is present, report to the shipper and analyze the damage.

#### 3.1.1 Ensuring Proper Airflow

- Maintain ambient airflow to ensure normal operation. If the airflow is blocked or restricted, or if the intake air is too warm, an over temperature condition can occur.
- Ensure that cables from other equipment do not obstruct the airflow through the systems.
- Use filler panels to cover all empty chassis slots. The filler panel prevents fan air from escaping out of the front of an open slot.



**Caution!**

*To maintain proper airflow, all open slots must be covered with filler panels. The filler panel should include an airflow baffle that extends to backplane.*



## 3.2 Basic Functional Check



### Warning!

*Voltages over 60 VDC can be present in this equipment. This equipment is intended to be accessed, to be installed and maintained by qualified and trained service personnel only.*

*This equipment is designed in accordance with protection class 1!  
It must therefore be operated only with protective GND/earth connection!*

Before starting the system with VME boards the following tests have to be done:

- Ensure that the unit does not get damaged during transport.
- Check the Protective Earth (PE) resistance, should be  $< 0,1 \text{ Ohm}$ .
- Switch on the system and check all VME voltages on the Backplane connectors before you plug in the VME boards.
- Plug in the VME boards.
- Cover all open Slots with filler panels.
- Tighten the rear panel mounting screws.
- Power-on the system and determine the actual current consumption.
- Replace the mains fuses suitable to the actual current.



*The fuse value has been determined in factory for the maximum power delivered by the power supply. The fuse value must be adjusted to the actual current consumption of the completed system.*

*Maximum value is 8 A slow blow.*

## 4 Service

### 4.1 Technical support and Return for Service Assistance

For all product returns and support issues, please contact your Schroff sales distributor or [www.schroff.biz](http://www.schroff.biz).

We recommend that you save the packing material. Shipping without the original packing material might void the warranty.

### 4.2 Declaration of Conformity

Microcomputer packaging systems are not complete units which can be delivered directly to the end user, other items need to be fitted.

As it is defined in the EMC standard, it is not designated as a device. A CE symbol is therefore not required. However, the systems comply with all requirements. Each individual component complies to the EMC standard 89/336/EWG and to the low frequency standard 73/23/EWG.

These systems are generally equipped with power supplies having the CE symbol (EN 60950, EN 61000-6-3, EN 61000-6-2).

The choice of the mains filter is carried out by considering the limited values' curve, according to EN 55022 class B.

To warrant the interference immunity according to EN 61000-6-2, the shielding attenuation is measured in the frequency range from 30 MHz to 1000 MHz according to VG 95 373, Part 15.

The systems are developed and manufactured according to EN 60950. High-voltage tests, protective earth tests and functions tests are done on each series system.

### 4.3 Scope of delivery

Quantity	Description
1	Tower System, shielded, front frame, feet, handles: RAL 7016; side panels: RAL 9006)
1	VME64x Backplane (VITA 1.1-1997), 7 Slot 6 U
1	Front assembly area for max. 7 Boards 6 U 160mm deep Guide rails incl. ESD-Clips (ESD-Clips assembled at front bottom)
1	Rear assembly area for max. 7 Boards 6 U 80mm deep Guide rails incl. ESD-Clips
1	AC mains/line module with IEC 320-C14 connector, mains fuses and line filter
1	3 U / 8 HP plug-in power supply 250 W with wide range input 100 VAC to 240 VAC (with 4 voltages: 5 V / 40 A; 3.3 V / 40 A; 12 V / 5.5 A, -12 V / 2 A)
1	Complete AC/DC wiring
1	Display module and mains switch
4	Speed controlled fans
1	Air Filter
1	FCM-Module for fan monitoring and controlling
1	Perforated front panel 5 U with air filter

### 4.4 Accessories

Parts-No.	Description
20848-7xx	Filler panel with EMC front plate for empty Slots, dimensions see catalogue
34562-8xx	Filler panel for empty Slots, dimensions see catalogue
24579-03x	Printed Circuit Board covers, dimensions see catalogue

### 4.5 Spare Parts

On request.

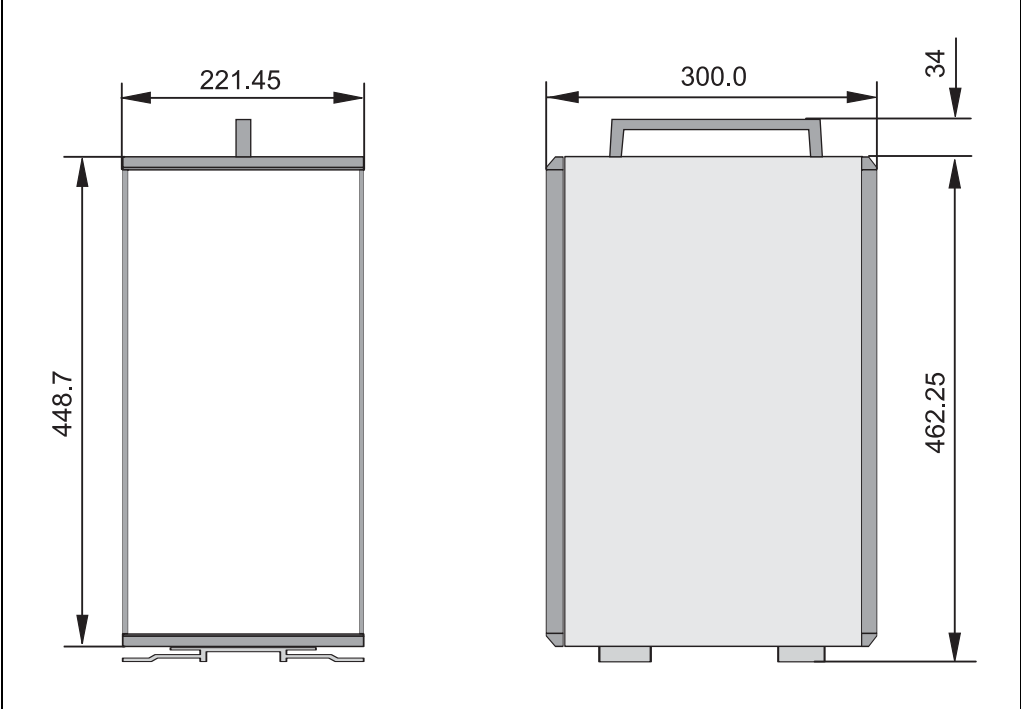
## 5 Technical Data

Table 2: Technical Data

<b>Dimensions</b>	
Height	448.7 mm
Width	496.25 mm
Depth	300 mm
<b>Weight</b>	
	14 kg
<b>Power supply</b>	
Input voltage	100 VAC to 240 VAC
Mains frequency	50 / 60 Hz
Power consumption)	up to 250 W
<b>Cooling</b>	
4 x 24 VDC Fans	Each 125 m <sup>3</sup> /h (75 cfm)
<b>Ambient Temperature</b>	
Operating	0 °C to +45 °C
Storage	-40 °C to +85 °C
<b>Humidity</b>	
permissible Humidity	30 % to 80 %, non condensing
<b>EMC, the system meets the requirements for:</b>	
Emitted Interference	EN 55022
Interference Resistance	EN 55024
<b>Safety</b>	
Test voltage according to EN 60950	Input - Output: 4,3 kVDC Input- PE: 2,2 kVDC Output - PE: 0,7 kVDC Output - Output: 0,7 kVDC
Shock and Vibration:	EN 60068-2-6 and EN 60068-2-27
<b>Electromagnetic Shielding</b>	
Shielding attenuation	typ. 40 dB at 1 GHz if shielded front panels are used.

# 6 Dimensions

Figure 8: Mechanical Dimensions



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All dimensions in millimeters (mm).





**SCHROFF GMBH**

**Langenalberstr. 96-100  
D-75334 Straubenhardt**

**[www.schroff.biz](http://www.schroff.biz)**

**Tel.: + 49 (0) 7082 794-0**

**Fax: +49 (0) 7082 794-200**