Modular Computers®

CPCI
Power Supply
Manual

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February 01, 2002

The products described in this manual are in compliance with all applied CE standards.

Revision History

Manual/Product Title:	CPCI Power Supply Manual	
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01	Initial Issue	Feb. 01, 2002

Imprint

DISCLAIMER:

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This manual was realized by: **TPD/Engineering, PEP Modular Computers GmbH**.

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Environmental Protection Statement

These products have been manufactured to satisfy environmental protection requirements where possible. Many of the components used (structural parts, printed circuit boards, connectors, batteries, etc.) are capable of being recycled.

Final disposition of these products after their service life must be accomplished in accordance with applicable country, state, or local laws or regulations.

Explanation of Symbols

CE Conformity

This symbol indicates that the products described in this manual are in compliance with all applied CE standards. Please refer also to the section “Applied Standards” in this manual.

Caution, Electric Shock!

This symbol and title warn of hazards due to electrical shocks (> 60V) when touching products or parts of them. Failure to observe the precautions indicated and/or prescribed by the law may endanger your life/health and/or result in damage to your material.

Please refer also to the section “High Voltage Safety Instructions” on the following page.

Warning, ESD Sensitive Device!

This symbol and title inform that electronic boards and their components are sensitive to static electricity. Therefore, care must be taken during all handling operations and inspections of this product, in order to ensure product integrity at all times.

Please read also the section “Special Handling and Unpacking Instructions” on the following page.

Warning!

This symbol and title emphasize points which, if not fully understood and taken into consideration by the reader, may endanger your health and/or result in damage to your material.

Note...

This symbol and title emphasize aspects the reader should read through carefully for his or her own advantage.

For Your Safety

Your new *PEP* products have been developed and tested carefully to provide all features necessary to ensure their compliance with electrical safety requirements. They were also designed for a long fault-free life. However, the life expectancy of your products can be drastically reduced by improper treatment during unpacking and installation. Therefore, in the interest of your own safety and of the correct operation of your new *PEP* products, you are requested to conform with the following guidelines.

High Voltage Safety Instructions

Warning!

All operations on these products must be carried out by sufficiently skilled personnel only.

Caution, Electric Shock!

Before installing your new PEP products into a system always ensure that your mains power is switched off. This applies also to the installation of piggybacks.

Serious electrical shock hazards can exist during all installation, repair and maintenance operations with this product. Therefore, always unplug the power cable and any other cables which provide external voltages before performing work.

Special Handling and Unpacking Instructions

ESD Sensitive Device!

Electronic boards and their components are sensitive to static electricity. Therefore, care must be taken during all handling operations and inspections of this product, in order to ensure product integrity at all times.

Do not handle these products out of their protective enclosures while they are not used for operational purposes unless they are otherwise protected.

Whenever possible, unpack or pack these products only at EOS/ESD safe work stations. Where a safe work station is not guaranteed, it is important for the user to be electrically discharged before touching the products with his/her hands or tools. This is most easily done by touching a metal part of your system housing.

It is particularly important to observe standard anti-static precautions when changing piggybacks, ROM devices, jumper settings etc. If the products contain batteries for RTC or memory back-up, ensure that they are not placed on conductive surfaces, including anti-static plastics or sponges. They can cause short circuits and damage the batteries or conductive circuits.

General Instructions on Usage

In order to maintain PEP's product warranty, these products must not be altered or modified in any way. Changes or modifications to these products which are not explicitly approved by *PEP Modular Computers* and described in this manual or received from PEP Technical Support as a special handling instruction will void your warranty.

These products should only be installed in or connected to systems that fulfill all necessary technical and specific environmental requirements. This applies also to the operational temperature range of the specific product version which must not be exceeded. If batteries are present their temperature restrictions must be taken into account.

In performing all necessary installation and application operations, please follow only the instructions supplied by the present manual.

Keep all the original packaging material for future storage or warranty shipments. If it is necessary to store or ship the board please re-pack it as nearly as possible in the manner in which it was delivered.

Special care is necessary when handling or unpacking the product. Please, consult the special handling and unpacking instruction on the previous page of this manual.

Two Year Warranty

PEP Modular Computers grants the original purchaser of PEP products a ***TWO YEAR LIMITED HARDWARE WARRANTY*** as described in the following. However, no other warranties that may be granted or implied by anyone on behalf of PEP are valid unless the consumer has the express written consent of *PEP Modular Computers*.

PEP Modular Computers warrants their own products, excluding software, to be free from manufacturing and material defects for a period of 24 consecutive months from the date of purchase. This warranty is not transferable nor extendible to cover any other users or long-term storage of the product. It does not cover products which have been modified, altered or repaired by any other party than *PEP Modular Computers* or their authorized agents. Furthermore, any product which has been, or is suspected of being damaged as a result of negligence, improper use, incorrect handling, servicing or maintenance, or which has been damaged as a result of excessive current/voltage or temperature, or which has had its serial number(s), any other markings or parts thereof altered, defaced or removed will also be excluded from this warranty.

If the customer's eligibility for warranty has not been voided, in the event of any claim, he may return the product at the earliest possible convenience to the original place of purchase, together with a copy of the original document of purchase, a full description of the application the product is used on and a description of the defect. Pack the product in such a way as to ensure safe transportation (see our safety instructions).

PEP provides for repair or replacement of any part, assembly or sub-assembly at their own discretion, or to refund the original cost of purchase, if appropriate. In the event of repair, refunding or replacement of any part, the ownership of the removed or replaced parts reverts to *PEP Modular Computers*, and the remaining part of the original guarantee, or any new guarantee to cover the repaired or replaced items, will be transferred to cover the new or repaired items. Any extensions to the original guarantee are considered gestures of goodwill, and will be defined in the "Repair Report" issued by PEP with the repaired or replaced item.

PEP Modular Computers will not accept liability for any further claims resulting directly or indirectly from any warranty claim, other than the above specified repair, replacement or refunding. In particular, all claims for damage to any system or process in which the product was employed, or any loss incurred as a result of the product not functioning at any given time, are excluded. The extent of *PEP Modular Computers* liability to the customer shall not exceed the original purchase price of the item for which the claim exists.

PEP Modular Computers issues no warranty or representation, either explicit or implicit, with respect to its products' reliability, fitness, quality, marketability or ability to fulfil any particular application or purpose. As a result, the products are sold "as is," and the responsibility to ensure their suitability for any given task remains that of the purchaser. In no event will PEP be liable for direct, indirect or consequential damages resulting from the use of our hardware or software products, or documentation, even if PEP were advised of the possibility of such claims prior to the purchase of the product or during any period since the date of its purchase.

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General

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1. Overview

The *PEP Modular Computers'* power supply unit family includes both AC and DC input power devices with up to 12HP front panels. Either 3U or 6U in height, the devices are provided with P-series, DIN M-series, or ATX output connectors.

The power supply units can be provided for an output power range of 180W to 270W for AC/DC power supply units and 120W to 270W for AC/DC power supply units, with output voltages of +3.3V, +5.1V and ±12V.

2. Distinctive Features

The *PEP Modular Computers* CompactPCI backplanes can be distinguished according to the following distinctive features:

- Form factor (heightC:\Working Area\0201 CPCI PSU\Archive Area FlBk)
- Front panel dimensions
- Mechanics
- Plug-in compatibility
- Input voltages
- Voltage switching (AC devices)
- Output power
- Output voltages and currents
- Power supply connector
- Cooling
- Redundant supply capability
- Status indication
- Special features (e.g. heat resistant variant)

Terminology

Power supply units can be grouped either according to their form factor: ATX, 3U or 6U height and up to 12HP where the P-series is 8HP (4.064 cm or 1.6 inch) and the M-series is 12HP (6.96 cm or 2.4 inch) or input voltage (alternating current, direct current).

Input Voltages

PEP Modular Computers' power supply units running on AC input power are provided with a switching feature to choose among common US (Japan) and European AC voltage ranges. For the sake of understanding these voltage ranges can be indicated as the two rated voltages:

- V_{US} = 110V
- V_{EU} = 230V

Voltage Switching

Depending on the power supply unit, the V_{EU}/V_{US} switching is accomplished automatically (”autoranging”) or manually.

Output Voltages

The common output voltages are referred to as follows:

- V1 = +5V
- V2 = +3.3V
- V3 = +12V
- V4 = -12V

3. *PEP* CompactPCI Standard Power Supply Units

The following tables provide information to assist users in the selection of power supplies which are suitable to the user's requirements.

Table 1: PEP CompactPCI Standard PSU Family

Form Factor	Input Type	Power Output	Power Supply Connector	Power Supply Unit
ATX	AC	235	ATX	CP3-SVE-ATX235AC
3U	AC	180W	DIN M-Series	CP3-SVE-M180AC
		200W	Positronic P-Series	CP3-SVE-P200AC
	DC	120W	DIN M-Series	CP3-SVE-M120DC
		150W	DIN M-Series	CP3-SVE-M150DC
		200W	Positronic P-Series	CP3-SVE-P200DC
6U	AC	250W	DIN M-Series	CP6-SVE-M250AC-R
		270W	DIN M-Series	CP6-SVE-M270AC
	DC	250W	DIN M-Series	CP6-SVE-M250DC-R
		270W	DIN M-Series	CP6-SVE-M270DC

Table 2: Electrical Input Characteristics of PEP CompactPCI Standard PSU's

Input Type	Input Voltage Range(s)	Voltage Switching	Power Supply Unit
AC	V_{EU}: 187V..264V V_{US}: 99V..138V	Autoranging	CP3-SVE-M180AC
	V: 85..264V	–	CP3-SVE-P200AC
	V_{EU}: 180V..235V V_{US}: 95V..135V	Manual	CP3-SVE-ATX235AC
	V_{EU}: 187V..264V V_{US}: 99V.138V	Autoranging	CP6-SVE-M250AC-R
	V_{EU}: 187V..264V V_{US}: 99V..138V	Autoranging	CP6-SVE-M270AC
DC	8.5V..36V	–	CP3-SVE-M120DC
	36V..76V	–	CP3-SVE-M150DC
	36V..75V	–	CP3-SVE-P200DC
	40V..60V	–	CP6-SVE-M250DC-R
	40V..60V	–	CP6-SVE-M270DC

Table 3: Further Characteristics of PEP CompactPCI Standard PSU's

FF*	IN PWR	FP* (HP)	WGHT (KG)	CON TYPE	RED OP P*	LOAD SHR	IPMI (OPT)	ACT COOL	POWER SUPPLY UNIT
ATX	AC	32	1.3	ATX	N	–	–	INT	CP3-SVE-ATX235AC
3U	AC	12	1.0	M24/8	N	–	–	NREQ	CP3-SVE-M180AC
		8	0.84	P47	Y	Y	Y	REQ	CP3-SVE-P200AC
	DC	12	1.0	M24/8	N	–	–	(N)REQ	CP3-SVE-M120DC
		12	1.0	M24/8	Y	–	–	(N)REQ	CP3-SVE-M150DC
		8	0.84	P47	Y	Y	Y	REQ	CP3-SVE-P200DC
6U	AC	12	2.1	M24/8	Y	–	–	REQ	CP6-SVE-M250AC-R
		12	2.1	M24/8	N	–	–	NREQ	CP6-SVE-M270AC
	DC	12	2.1	M24/8	Y	–	–	REQ	CP6-SVE-M250DC-R
		12	2.1	M24/8	N	–	–	NREQ	CP6-SVE-M270DC

* FF = Form Factor; FP = Front Panel Width; RED OP P = Redundant Operation Possible; ACT COOL = Active Cooling; (N) = Not, depends on variant of PS; REQ = Required

4. Power Supply Connectors

The AC or DC input voltages to the power supply unit and the output voltages from the power supply unit to the backplane are connected via a power supply connector complying with one of the following specifications:

Table 4: Power Supply Connectors

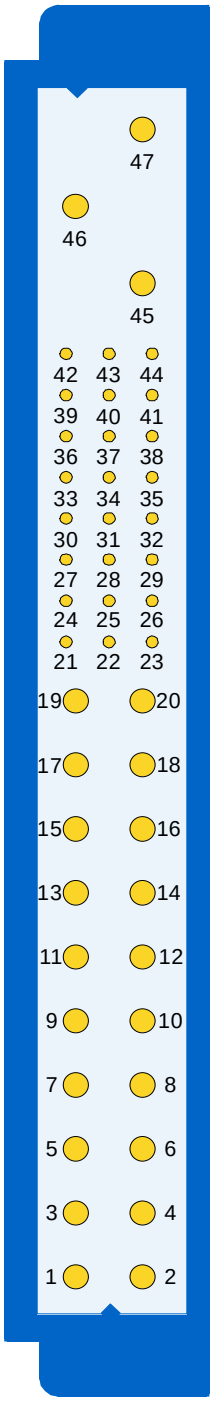
Connector Type	Description
ATX Connector	Female 20-pole ATX connector for power supply from the reverse side of the backplane; the ATX PSUs available on the market are provided with a matching connector.
DIN M-Series Connectors	3 or 4-pole DIN M-series male power supply connectors for power throughput to the power supply unit and a 30- (32-) pole DIN M24/8 male power supply connector for power reception from the power supply unit (DIN 41612)
Positronic P-Series Connectors	Female 47-pin Positronic connector for power supply from the reverse side of the backplane and a 47-pin Positronic male power supply connector for power reception from the power supply unit

Note...

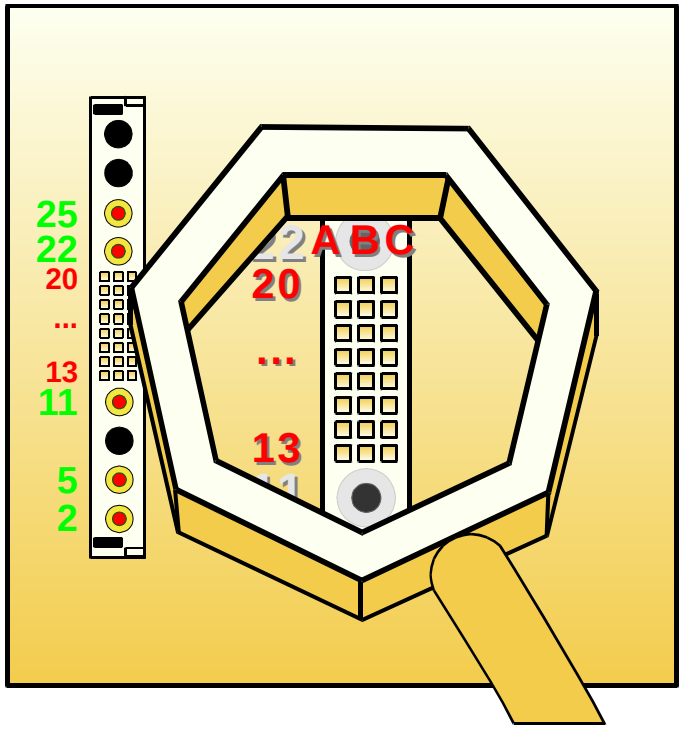
The term "power supply connector" is used both for the connectors receiving the backplanes' power supply and the mating output connectors of the power supply units.

Figure 1: Types of Power Supply Connectors

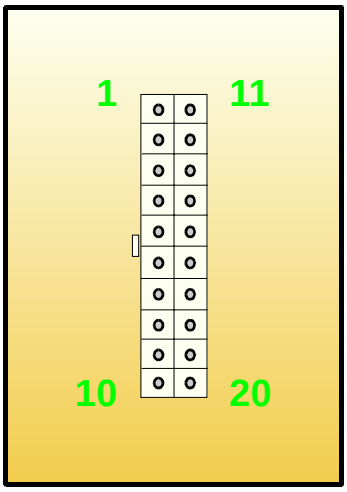
P-Series
Positronic P47 Connector



M-Series
DIN 24/8 Connector



ATX-Type Connector



5. Implementation Considerations

Power supply requirements are always based on the individual system requirements. As such, PEP's family of power supplies are designed to meet an extensive range of requirements from simple one unit systems to high capacity systems requiring multiple redundancy with load sharing capability.

Table 3 provides basic selection information for determining which power supply satisfies what requirement regarding its suitability for redundancy and load sharing applications. The system integrator must be fully aware of the implications of redundancy and load sharing as well as total power requirements before making any decision as to which power supply(-ies) to integrate in a given application.

PEP offers two categories of power supplies which can be used for redundant operations: the M-series which have only redundant operational capability, and the P-series which have both redundant as well as load sharing capabilities. Because the redundant M-series power supplies do not support load sharing they may not be used to increase available power in a system. The P-series power supplies, however, may be used for both purposes. It is, therefore, the responsibility of the system integrator to assure that all operational requirements of a given application have been considered before implementing a power supply scheme. Care must be taken to satisfy total projected system loading without overloading occuring, particularly where redundancy is required.

Warning!

Failure to comply with the implementation considerations as described above could result in physical damage to the power supplies themselves or to other system components. PEP assumes no responsibility or liability for any damage incurred directly or indirectly caused by improper system implementation or operation.

6. Product Documentation Organization

The product documentation organization for *PEP's* CPCI Power Supplies is as follows:

1. CPCI PSU Manual (ID: 24139)
2. CPCI PSU Product Documentation Guide (ID: 24139, Sub-ID: PDG)
3. Specific *PEP* CPCI PSU Product Documentation (ID: 24139, Sub-ID: PDnn)

Item 1 above is represented by this manual which provides generic information about *PEP's* CPCI power supplies. Item 2 is enclosed with this manual for referencing to applicable CPCI PSU Product Documentation. Item 3 represents the individual product documentation for specific power supplies. For each power supply addressed in item 2 there is a separate document available.

Each of the above items are maintained independently of one another, whereby item 2 always reflects the current status of available product documentation.

7. Applied Standards

The *PEP Modular Computers'* CompactPCI power supply units comply where applicable with the requirements of the following standards.

7.1 CE Compliance

• Emission	EN50081-1, EN 55011/EN 55022
• Immission	EN50082-2, EN 61000-4
• Electrical Safety	EN60950, VDE 0100, VDE 0805

7.2 Other Safety Standards

- UL, CSA, DVE, NEMKO

7.3 Mechanical Compliance

• Mechanical Dimensions	IEEE 1101.10

7.4 Environmental Tests

• Vibration/Broad-Band	IEC68-2-6
• Random Vibration	IEC68-2-64 (3U boards)
• Permanent Shock	IEC68-2-29
• Single Shock	IEC68-2-27

8. Related Publications

8.1 CompactPCI Systems/Boards

- CompactPCI Specification, V. 2.0, Rev. 2.1
- DIN 41612
- ATX Specification
- CompactPCI Power Interface Specification, 2.11 R1.0