

HEATPIPE COOLED
500 WATT
MODULAR POWER SUPPLY

(English)

User's Manual

ZM500-HP



Please read this manual before installing

ZALMAN
COOL INNOVATIONS

1. Safety Precautions

■ The following precautions and directions are measures against possible accidents and injuries. Please read them thoroughly before using this product.

Warning

Neglecting the following may cause serious injury or death.

- ▶ Opening the cover of the product while the power cord is plugged into an outlet may cause electrocution or critical damage to the product.
- ▶ Handling the power cord with wet hands may cause electrocution.
- ▶ Inserting fingers or metallic objects into the cooling fan may cause injury or electrocution.

Caution

Neglecting the following may cause minor injuries, degrade product conditions or cause malfunction.

- ▶ Operating the product in an extremely cold or hot environment can degrade product performance and lifespan.
- ▶ Liquids that enter the product may cause malfunction.
- ▶ Operation in a humid or non-ventilated environment may reduce product lifespan.

2. Components

- 1) One Power Supply
- 2) One Cable for PCI-E2
- 3) Three Cables for ODD/HDD
- 4) Two Cables for S-ATA
- 5) One Fan Dual-connector (ZM-DC1)
(See page 4 for details)
- 6) One Power Cord for AC Power Source (Not included in some countries)
- 7) One User's Manual
- 8) Five Cable Ties

3. Notes on Installation

※ To ensure a safe and easy installation, please read the safety precautions above and the following notes.

- Plugging the main power connector P1 into the motherboard while the product is connected to the AC power source may cause damage to the motherboard.
- Make sure that the connectors are connected to their designated locations, and that the connectors are not oriented in the wrong direction when connecting the DC output connectors.
- If the Power ON LED fails to light up when the main power button is pressed after completing the installation procedure, some devices may be connected in incorrectly or the motherboard may be faulty.

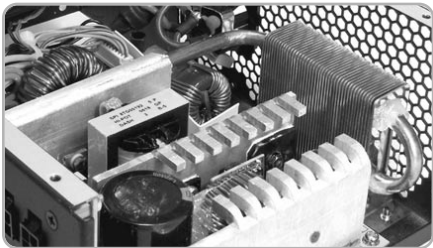
4. The Zalman Advantage

Zalman's CNPS* products enable a noiseless computing environment, in accordance with our policy of developing people-friendly products. This ultra-quiet power supply complies with ATX12V Version 2.2, and supports the latest dual-core CPUs(Intel Core2 series/AMD Athlon64-X2 series), as well as the latest dual graphic card systems(SLI/CrossFire).

* CNPS (Computer Noise Prevention System) refers to a system that reduces a conventional computer's noise level (30dB or more) to an inaudible level (20dB or less). Zalman's silent/ultra-quiet computers of the highest quality.

■ Heatpipe Installed for Maximum Cooling Performance and Ultra-Quiet Operation

A heatpipe with ultra-high cooling performance incorporated on the power supply's main rectifiers enables high load operation even at low RPM for a dramatic reduction in noise levels.



■ Improved Power Factor & Reduced Harmonics through Active PFC

By implementing Active PFC(Power Factor Correction), the Power Factor (PF) is improved from 75% (Passive PFC) up to 99% while harmful harmonic frequencies are reduced to meet the line harmonic distortion requirements of IEC61000-3-2 Class D.

■ High Efficiency Design

This power supply is capable of reaching a maximum of 81% efficiency(230VAC, Full & Typical Load) through its use of high switching frequency and low power-loss circuitry.

■ ATX20+4 Pin Main Connector

ATX20+4 pin main connector broadens the range of motherboard compatibility.

■ Supports ATX12V CPU 4-Pin and EPS12V CPU 8-Pin

Two ATX12V CPU 2 x 2(4-Pin) power cables can be combined to form an EPS12V CPU 8-Pin power cable.

■ Dual PCI Express VGA Power 6-Pin Connector

Supports Nvidia SLI and ATI CrossFire dual graphic card systems.

■ Modular Cables

Modular cables provide organized cable management and improved air circulation inside the computer case.

■ Ultra Quiet 120mm Fan

Ultra quiet 2-Ball Bearing 120mm fan maximizes the airflow and minimizes the noise level enabling a noiseless computing environment with optimized cooling.

■ Two Independent +12VDC Outputs

Two +12VDC rails supply power independently to the CPU, VGA, motherboard, and peripheral components for the highest level of stability and performance.

■ EZ Grip Connectors for ODDs & HDDs

EZ Grip Connectors for easy removal of the plugs from ODDs & HDDs.

■ Gold-Plated Terminals

Gold-plated terminals minimize power loss by reducing contact resistance.

■ Sleeved Cables

All power cables are sleeved for easy cable management and improved air circulation inside the computer case.

■ Multiple Safety Features

Over-Voltage Protection, Over-Current Protection, Short-Circuit Protection, Under-Voltage Protection, Over-Temperature Protection.

■ Internal Blue LED

Blue LEDs are installed inside the power supply for cool aesthetics.

■ WEEE & RoHS

Complies with WEEE & RoHS environmental directives of European Union.

* WEEE (Waste Electrical and Electronic Equipment)

* RoHS (Restriction of Hazardous Substances)

■ International Safety and EMC Certifications



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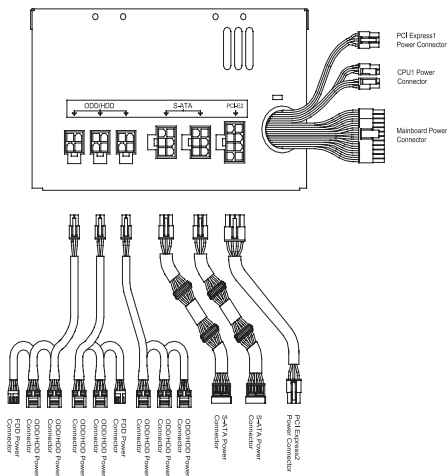
ZMT-ZM500-HP(B)



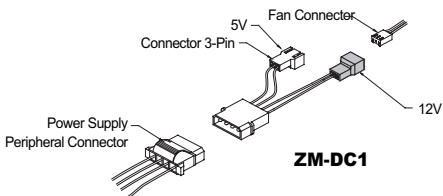
5. Specifications

■ Output Power Cable Specifications

Cable Types and Function



Using the Dual-Connector (ZM-DC1)



■ Electrical & Physical Characteristics

AC Input Range	Voltage	100VAC ~ 240VAC ± 10%		DC OUTPUT					
	Frequency	47Hz ~ 63Hz		ZM500-HP					
AC Input Range (Rated)	115VAC	10A		Vout	Output Load Rating			Combined Power	
	230VAC	5A			I _{min}	I _{max}	I _{peak}		
PFC Type	Active PFC			+3.3V	0.8A	24A		140W	
Power Factor	99% Maximum			+5V	0.5A	24A			
Inrush Current Limit (@ Cold start at 25°C)	115VAC	60A		+12V1	1A	25A		432W	
	230VAC	100A		+12V2	1A	18A			
Efficiency	81% Max @230VAC, Full & Typical Load			-12V	0.0A	0.5A		18.5W	
DC Output Voltage Regulations	Vout		Regulation Range		At Full Load	Protection			
	+3.3VDC	±5%	+3.14V	~		+3.47V	Over-Voltage Protection (OVP)		
	+5VDC	±5%	+4.75V	~		+5.25V	Over-Current Protection (OCP)		
	+12V1DC	±5%	+11.4V	~		+12.6V	Under-Voltage Protection (UVP)		
	+12V2DC	±5%	+11.4V	~		+12.6V	Short-Circuit Protection(SCP)		
	-12VDC	±10%	-10.8V	~		-13.0V	Over-Temperature Protection (OTP)		
	+5VSB	±5%	+4.75V	~		+5.25V			
DC Output Ripple & Noise	Vout		Specification		At Full Load	Ambient Temperature			
	+3.3VDC		100mV			Operation	0°C ~ +50°C		
	+5VDC		100mV			Stored	-20°C ~ +80°C		
	+12V1DC		200mV			Ambient Humidity			
	+12V2DC		200mV			Operation	5 %RH ~ 95 %RH		
	-12VDC		200mV			Stored	5 %RH ~ 95 %RH		
	+5VSB		100mV			Dimensions			
				150mm(L) * 165mm(W) * 86mm(H)					

6. Zalman's CNPS (Computer Noise Prevention System) Products

For a stable and noiseless system of the highest quality, use Zalman's Ultra Quiet CPU Coolers, Ultra Quiet VGA Coolers, Heatpipe HDD Coolers, Fanless Northbridge Coolers, and Noiseless Case Fans.



Ultra Quiet CPU Cooler



Ultra Quiet VGA Cooler



Heatpipe HDD Cooler



Quiet CPU Cooler



Fanless Northbridge Cooler



Noiseless Case Fan

7. Product Warranty (International)

Thank you for purchasing Zalman's product.

Warranty - If this product has any defects, then Zalman guarantees that it can be exchanged within three (3) years from the time of purchase.

* Product exchange is made with the reseller where the product was purchased. For further inquiries, contact Zalman Headquarters at www.zalman.co.kr or via e-mail to a representative.

There will be no exchanges in the following cases :

- A) Violation of the Safety Precautions and the Notes on Installation in this manual.
- B) Human fatality and/or property damage due to events of natural causes.
- C) External case damage, electrical problems, and damage to components caused by careless mishandling.

Disclaimer - Zalman Tech Co., Ltd. is not responsible for any damages due to external causes, including but not limited to, improper use, problems with electrical power, accident, neglect, alteration, repair, improper installation, or improper testing.

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Disposal of Old Electrical & Electronic Equipment
(Applicable in the European Union and other European countries with separate collection systems)