

MCW5002-PT™

THERMOELECTRIC WATER-BLOCK Installation Guide for Intel® Pentium® 4

Part	Qty	Part	Qty
MCW5002-PT assy with TEC and gaskets	1	Arctic Alumina thermal compound	1
3/8" NPT to 1/2" barb fittings	2	Euro-style connector	1
Motherboard installation hardware pack	1		

This product is intended for expert users only. Please consult with a qualified technician for installation. Improper installation may result in damage to your components. **Swiftech assumes no liability whatsoever, expressed or implied, for the use of these products, nor their installation.** The following instructions are subject to change without notice. Please visit our web site at www.swiftnets.com for updates.

Assembly exploded view & part numbers

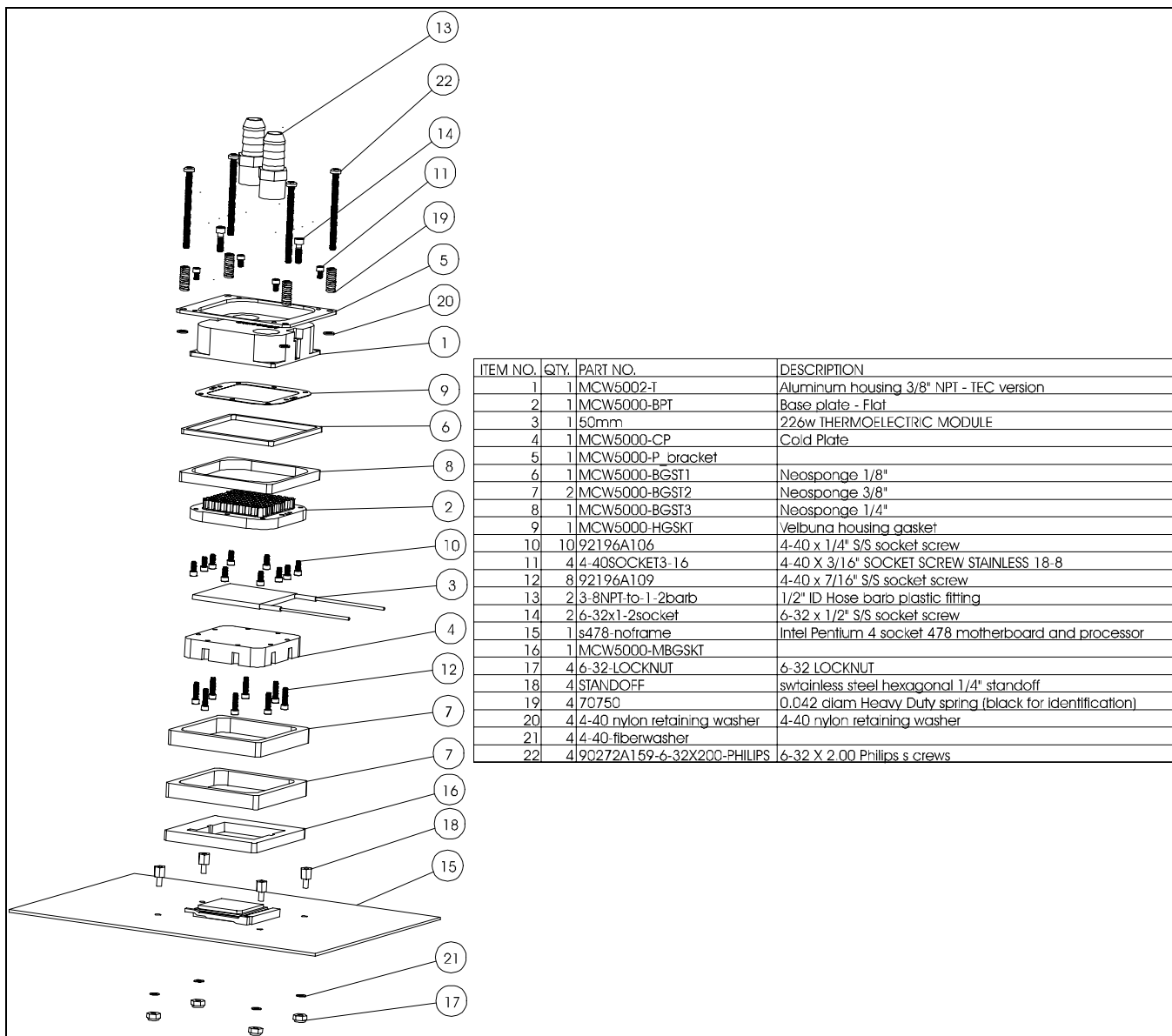


Figure 1

a. Preparing the motherboard

Remove the stock heatsink retention frame (the black plastic frame that clips down to your motherboard). This will reveal the four mounting holes used to install the MCW5000-PT™ retention standoffs.

Install a standoff in each one of the holes. As the diameter of the mounting holes is much larger than the diameter of the standoff stem, be careful to keep the standoff approximately centered in the MB holes. Secure standoffs with hex locknuts, and a fiber washer on backside of the MB as shown on fig. 1, using the tools described fig. 2

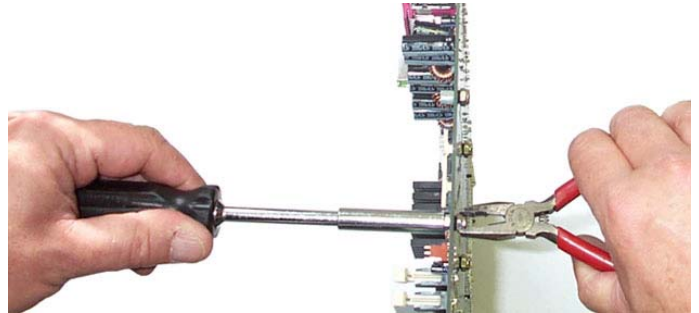


Figure 2

Use a 1/4" socket tool to drive the standoff, and a small pair of pliers to prevent the locknut from spinning. Torque value should not to exceed 16 in. lbs. In other words JUST TIGHT, WITHOUT EXCESSIVE TORQUE.

b. Condensation control measures

The following instructions are crucial to long lasting & reliable operations. Do not skip these steps, and do not take shortcuts. Permanent damage to your components is likely to occur otherwise.

a. Motherboard preparation

- i. **Conformal coating application:** This step will positively ensure that any micro condensation occurring on small surface mount components will not corrode or short-circuit the motherboard.

Procure a spray can of silicone conformal coating. We use M.G. chemicals Acrylic Conformal Coating, part # 419B-340g – A list of retail distributors carrying this item can be found here (US): <http://www.mgchemicals.com/distributors/us/index.html>, Canada: <http://www.mgchemicals.com/distributors/canada/index.html> . Equivalent products can also be used. Sprays are recommended for their ease of use. The product can also be purchase at our online store here (effective 7/15/04): <http://www.swiftnets.com/store/category.asp?CatID=11>



Figure 3

Spray the back of the motherboard, concentrating on the area immediately behind the CPU. Allow time to dry, per manufacturer specs.

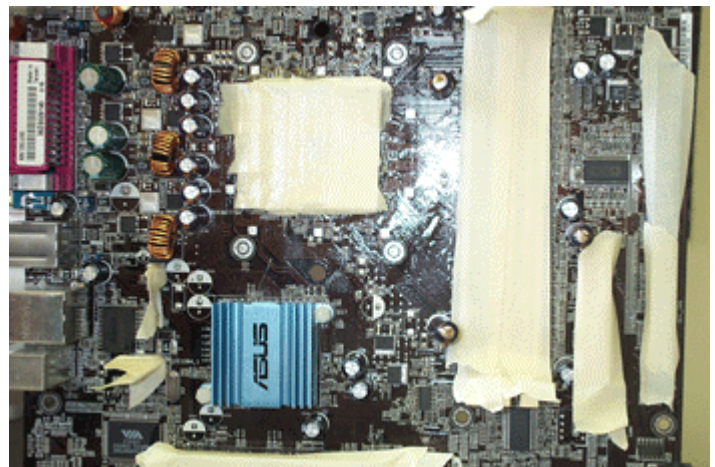


Figure 4

Use masking tape to protect the CPU socket, and any connector sockets in the immediate vicinity of the socket. A double layer of tape is recommended for the CPU socket.



Figure 5

Spray the area immediately surrounding the socket. It is not recommended to spray further than the area circled in the above picture. Allow time to dry per manufacturer specs.

- ii. **Dielectric grease application:** This step will ensure that condensation does not form inside of the CPU socket.

Procure a tube of dielectric grease. We use Lubrex grease, available on our web site here:

<http://www.swiftnets.com/store/category.asp?CatID=11>

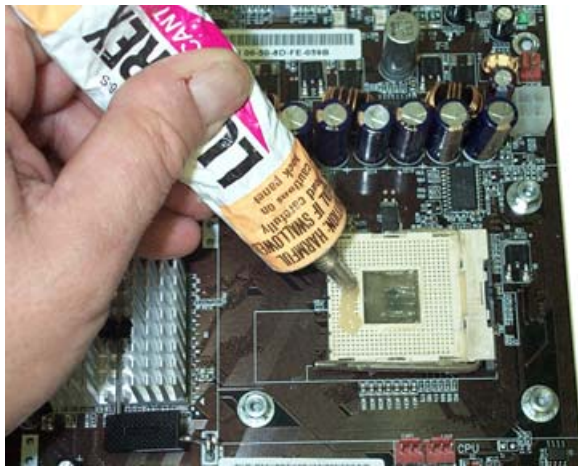


Figure 6

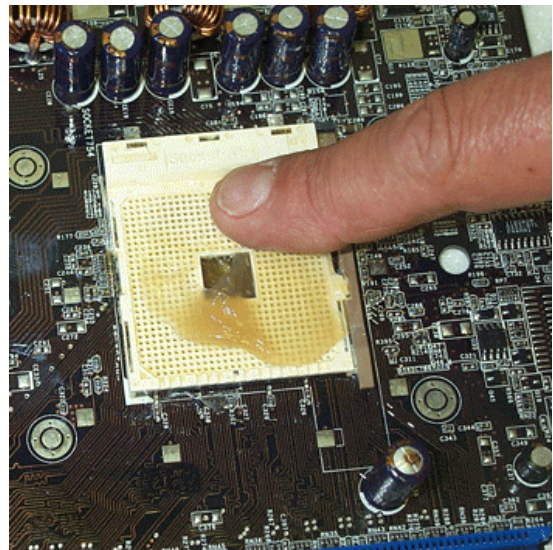


Figure 7

Squirt a generous amount of grease onto the socket.

Force the grease inside of the pin-holes with your finger. Make sure that the central area of the socket is completely filled with grease.

- **To complete the condensation prevention measures, simply apply the neoprene sticker provided with your MCW5002-PT™ accessories to the back of the motherboard, directly behind the processor.**

- b. **CPU and cooler installation:**

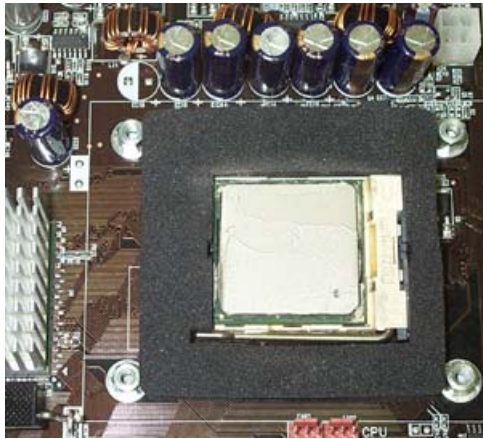


Figure 8

- ❑ Remove the peel-off paper back from the motherboard gasket, and install it as shown above. The sticky side should be towards the motherboard.
- ❑ **Insert the processor** into the socket. Since you have grease inside the socket, some hydraulic pressure lift may occur: for this reason, make sure that the processor sits perfectly flat, and is inserted all the way into the socket.
- ❑ Then, drop a small amount of high quality thermal compound onto the center of the processor core.

Installation of the cooler to the motherboard is now complete!

Securing the MCW5002-PT cooler to the motherboard:

Install the MCW5002-PT™ assembly onto your processor, as shown in figure 9.

- ❑ Gradually tighten the screws in a crisscross pattern until you feel that they reach the bottom of the standoff. A “finger-tight” lock is sufficient. Conversely, adjustments such as tightening the screws only partially are strictly prohibited. Such attempts will result in improper contact between the CPU core and the heat sink, and result in CPU overheating.



Figure 9
(showing an MCW5000-PT)

c. Electrical Installation

IMPORTANT WARNING: Solder joints of the wires to the thermoelectric module are **extremely fragile**. Bending the wires at their root will break the solder joint, with no possible repair. **Swiftech will not honor the warranty for broken wires.**

a. Recommended installation: Connecting to a dedicated auxiliary power supply

- ❑ Minimum requirements for a dedicated power supply are 25A @ +12V.
- ❑ Your TEC module has been measured to draw 18 amps at 12 volts. For this reason, we recommend using the “Meanwell S320-12” auxiliary power supply, available on our website in the Thermoelectric accessories section.
- ❑ The TEC module is provided with “bare wires” to facilitate installation with screw type terminals such as featured in the S320-12 power supply
- ❑ Connect red wire from TEC module to the +V terminal, and black wire to the –V terminal as shown in figure 10.
- ❑ A complete installation guide for the S320-12 power supply kit is available here: http://www.swiftnets.com/products/installationguide_S320-12kit.pdf - This kit includes a wiring harness and a relay switch to synchronize the power to the S320-12 with your computer, which is a **highly recommended (read critical recommendations)**



Figure 10

CRITICAL RECOMMENDATIONS MUST READ!!!

Never run a thermoelectric module without coolant flowing in the circuit. This will result in catastrophic failure of the cooling element, and may cause any/all of the following:

- Tubing to burst open due to coolant overheating
- Permanent failure of the Peltier module
- Permanent damage to the CPU and/or motherboard due to excess heat

It is highly recommended to dedicate the auxiliary power supply for the thermoelectric module to the computer power-supply, so that the Peltier module will never run by itself without cooling fluid.

For this purpose, we recommend using the following accessory, available in our online shopping cart: PRS Kit II. Includes: Relay Switch Circuit board AC socket, S/S socket cover, power cord. This relay switch is rated for 110 to 220~240 volts and up to 50A inrush current. It is suitable for use with the S-320-12 Meanwell power supply recommended above.

If you run your computer unattended for extended periods of time, it is also a good practice to setup an alarm temperature, which will shut down the computer in case the CPU overheats. Such alarm/shut down process should be tested as functional.

WARNING! Wires from the thermoelectric module do get hot (this is normal). Make sure that the wires do not touch devices that are heat sensitive, such as vinyl tubes for example. Heat from the wires may cause the vinyl to deform, and/or burst.

b. Connecting to your computer power supply:

Important Warning: to connect the MCW5002-PT™ cooler to an ATX computer power supply, you must carefully consider the existing requirements of other devices connected on the +12V line. Connecting to an underpowered unit will definitely damage the power supply.

Minimum requirements for an ATX computer power supply: 36A at +12V in a typical computer setup.

When you connect the MCW5002-PT™ to an ATX power supply, you need to cut the wiring to one of the power supply Molex connectors, and use a different connector between power supply, and thermoelectric. This is because Molex connectors are not rated for 18Amps current, and may overheat.

c. Connecting TEC wires to the power supply:

Use the provided euro-style wire connector as shown in fig 11 below, or a similar device with a current rating of at least 25 amps. Connect red wire from TEC module to +12V of P/S (Yellow wire), and black wire to black wire:

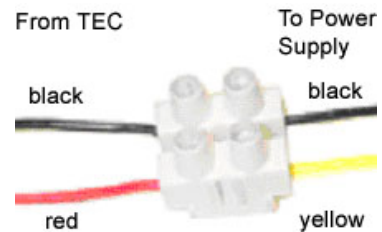


Figure 11

If you need wiring extensions: use 16 gage stranded wire. Connect the extension to the existing wires with **terminal splices**, or solder the butts, and insulate with shrink tubing.

d. Hydraulic Installation

- ❑ The MCW5002-PT is shipped with 1/2" barb to 3/8" NPT nylon fittings. These fittings should be installed using Teflon tape or plumbers "goop". If fittings need to be replaced for a difference tubing size, do not use brass fittings, because of the galvanic corrosion that will take place between copper or brass and the MCW5002-PT aluminum housing. Always use nylon fittings.
- ❑ Inlet and outlet are interchangeable.
- ❑ Type of Coolant:
 - For best performance, use 95% distilled water, and 5% Swiftech brand "HydrX" corrosion inhibitor (available here: <http://www.swiftnets.com/store/category.asp?CatID=2>, under the "accessories" section).
 - In all cases, you must use Distilled water and a corrosion inhibitor with the MCW5002 water-block. Regular automotive anti-freeze is acceptable. Automotive manufacturers recommend that not less than 25% is used.
 - NEVER use tap water, even for a short-term test.
 - Not following the above instructions constitutes misuse (*) of the product, and will void your warranty.

4. Final inspection

Once the installation is completed, **it is always a good idea to test the circuit for leaks, prior to powering up the computer.** Troubleshooting help is available on our web site at www.swiftnets.com, or by calling customer support at 562-595-8009.

IMPORTANT DISCLOSURES

While all efforts have been made to provide the most comprehensive tutorial possible, Swiftech assumes no liability expressed or implied for any damage(s) occurring to your components as a result of using Swiftech cooling products, either due to mistake or omission on our part in the above instructions, or due to failure or defect in the Swiftech cooling products.

WARRANTY

Our products are guaranteed for 12 months from the date of delivery to the final user against defects in materials or workmanship. During this period, they will be repaired or have parts replaced provided that: (I) the product is returned to the agent from which it was purchased; (II) the product has been purchased by the end user and not used for hire purposes; (III) the product has not been **misused (*)**, handled carelessly, or other than in accordance with any instructions provided with respect to its use. This guarantee does not confer rights other than those expressly set out above and does not cover any claims for consequential loss or damage. This guarantee is offered as an extra benefit and does not affect your statutory rights as a consumer.