



Quiet Power™

FS20-H20 series

Liquid cooled case

Installation guide

Bare case parts nomenclature

NO	PARTS	PS	NO	PARTS	PS
1	BEZEL, FRONT	1	19	PANEL, FRONT	1
2	BEZEL, FRONT, SUB	1	20	PANEL, REAR	1
3	BUTTON, POWER	1	21	SIDE, PANEL	2
4	BUTTON, RESET	1	22	CAGE, 5.25	1
5	LENS	1	23	FILLER TOP 3.5	1
6	COVER, 5.25 FDD	4	24	BRACKET, HDD	1
7	COVER, 3.5 FDD	2	25	SLIDE BRACKET P/S	1
8	SPRING	1	26	BASE, M/B	1
9	PLATE, CAGE, 5.25	2	27	CROSS BAR	1
10	SPEAKER	1	28	BRACKET, LED ASSY	1
11	BULKHEAD ASSY	1	29	FAN 120MM	1
12	SHIELD, I/O	1	30	SNAP RIVET	8
13	CAGE, 3.5 ASSY	1	31	SHIELD	1
14	CARDGUIDE	1	32	THUMB SCREW	2
15	POWER SUPPLY	1	33	SCREW	1
16	BRACKET, P/S	1	34	RIVET, ALUMINUM	49
17	COVER, TOP	1	35	RIVET-SUS	8
18	CHASSIS, BOTTOM	1	36	SCREW	20
			37	MEMORY BOARD CROSS BAR	1



BEFORE YOU BEGIN!

Components installation

1. Open the side-panel #21 by loosening thumb screws #32
2. Remove the main cross bar #27.
3. A special memory board cross bar (#37) specific to server applications is provided with the lose parts. It is not shown in the schematic above, and can be safely discarded in most consumer applications.
4. Loosen screw #33, and remove the front bezel #1
5. Remove the top cover #17

You now have full access inside the case to proceed with the installation of your power-supply, motherboard, hard drive (s) and various components.

Liquid cooling circuit notes

- The water-block is installed onto the back-panel for safe shipping. Unscrew the 4 springs assemblies, and remove the four standoffs used to secure the block onto the back-panel. *You will need these standoffs later, together with the spring and screw assemblies to install the water-block to your motherboard.*
- During installation of your motherboard inside the case, it is good practice to strap the block out of the way, using a rubber band for example.
- *Your cooling circuit is already filled with coolant (90% pure water, 10% coolant).* All you need to do is to install the water-block to your CPU. Please follow the separate installation guides for AMD® or INTEL® processors.
- Power to the pump: a spare power cord is provided to supply A/C power to the pump. *It needs to be connected to an A/C outlet.*

Water-block pre-installation notes:

Intel® processors

The MCW462 water-block is shipped with Intel® Pentium® 4 brackets pre-installed. These brackets feature different mounting holes to accommodate Intel's various mounting form factors. Please refer to the Intel® installation guide below, to identify the holes that will be needed for your particular motherboard.

AMD® processors

Please remove the Intel® Pentium® 4 brackets from the MCW462 water-block, using the provided socket wrench, then follow the AMD® installation guide below.

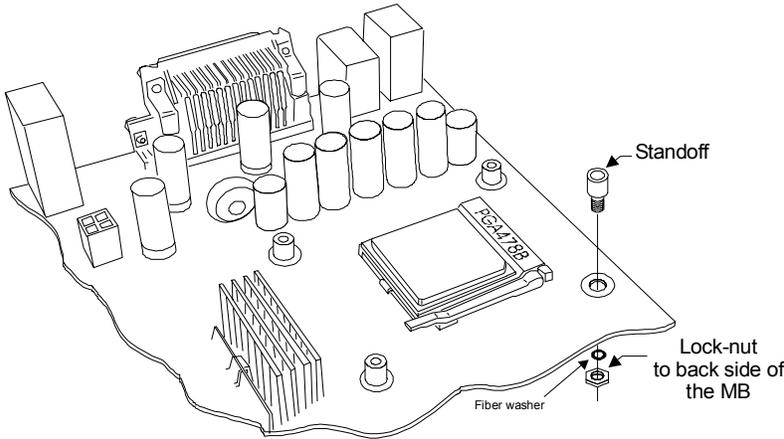
I. Installation Guide for Intel® processors

Parts list

Parts	AMD	INTEL	QTY	PARTS	AMD	INTEL	QTY
Water-block	Common to both		1	6-32 lock-nuts	Common to both		4
6-32 x 1 ½" screws (for HS)	Common to both		4	Black fiber washers	X		8
Standoffs	Common to both		4	Thermal grease	Common to both		1
Springs	Common to both		4	Tube insert	Common to both		2
Nylon flat washers	X		8	P4 brackets		X	2
Nylon shoulder washers	X		4	4-40 socket screws		X	4

I. Preparing the motherboard

- Install standoffs in MB



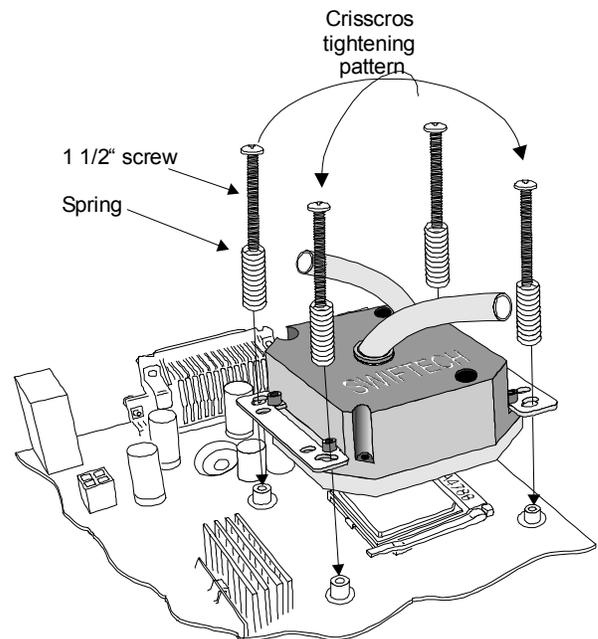
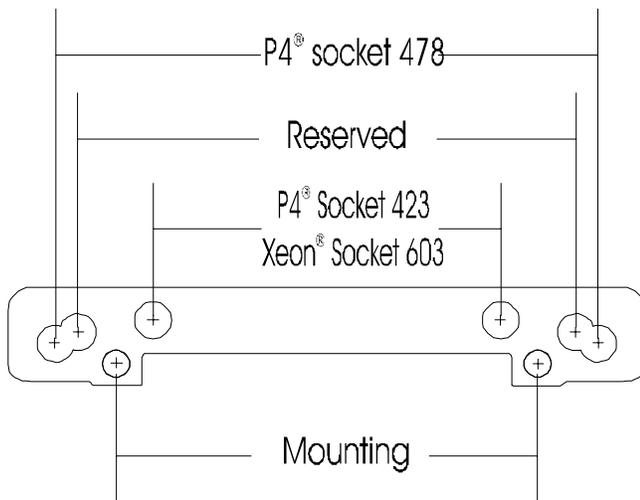
Remove the stock heatsink support base (the black plastic frame that clips down to your motherboard). This will reveal the four mounting holes we use to install our standoffs. Install a standoff in each one of the holes. Keep the standoff centered over the MB holes, and secure with fiber washers and locknuts on backside of the MB.

- Install the MB inside the case.

II. Water-block installation

- The case should be laying flat on a table.
- Insert the processor into the socket, and lightly coat the processor core with the included thermal compound (Arctic Alumina). **Only a paper-thin coat is necessary.** It should be applied using preferably a razor blade, or a credit card, held between thumb and index at a 45-degree angle. It is critical to ascertain that the entire core is covered with a uniform coat of thermal compound. Thermal performance will dramatically decrease if any portion of the core is not covered by thermal compound.

- Prepare 4 assemblies composed of a 1 1/2" screw, and 1 spring.
- Identify the mounting holes on the bracket for your processor, as shown in the schematic below



- Install the MCW462-U on the CPU.
- 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. 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.

II. Installation Guide for AMD[®] processors

Parts list

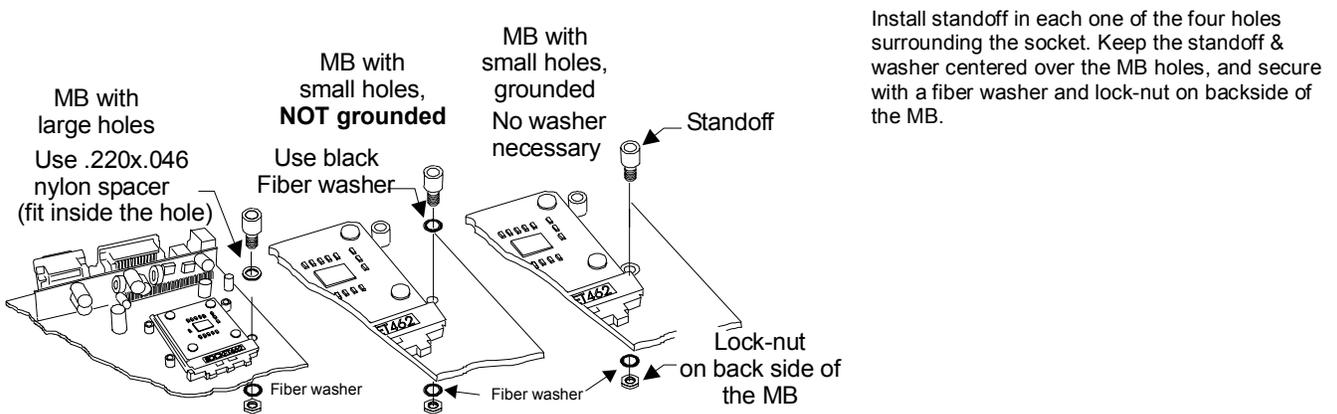
Parts	AMD	INTEL	QTY	PARTS	AMD	INTEL	QTY
Water-block	Common to both		1	6-32 Lock-nuts	Common to both		4
6-32 x 1 1/2" screws (for HS)	Common to both		4	Black fiber washers	X		8
Standoffs	Common to both		4	Thermal grease	Common to both		1
Springs	Common to both		4	Tube insert	Common to both		2
.230x.096 Nylon spacers	X		8	P4 brackets		X	2
.220x.046 Nylon spacers	X		4	4-40 socket screws		X	4

I. Preparing the motherboard

- **Install standoffs in MB**

Determine which standoff washers to use, depending on your MB mounting holes:

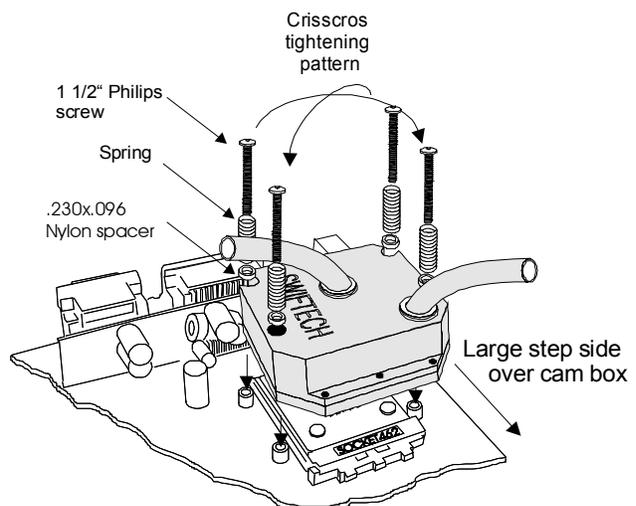
- Large holes .230"(5.8mm) diameter : use .220x.046 Nylon spacers. The washers fit inside the MB hole.
- Small **grounded** holes .150"(3.8mm) diameter: you can recognize grounding by a silver ring around the holes; no washers needed nor necessary.
- Small holes, **NOT grounded** (bare circuit board): you **must** use black fiber washers, or damage to the MB may occur.



- **Re-install the MB** inside the case.

II. Water-block installation

- **The case should** be laying flat on a table.
- **Insert the processor** into the socket, and lightly coat the processor core with the included high quality thermal compound (Arctic Alumina). **Only a paper-thin coat is necessary.** It should be applied using preferably a razor blade, or a credit card, held between thumb and index at a 45-degree angle. It is critical to ascertain that the entire core is covered with a uniform coat of thermal compound.
- **Prepare 4 assemblies** composed of a 1 1/2" screw, 1 nylon spacer, and 1 spring as shown in Figure 2. Drop each assembly into the MCW462-U mounting holes.
- **Install the MCW462-U block on the CPU.** The copper base of the MCW462-U features a large step for clearance with the socket cam box. Make sure to respect this orientation. Keep the heat sink mounting holes lined up with the standoffs. Avoid twisting the block to prevent smearing the thermal compound.
- **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. 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.



II. Temperature troubleshooting

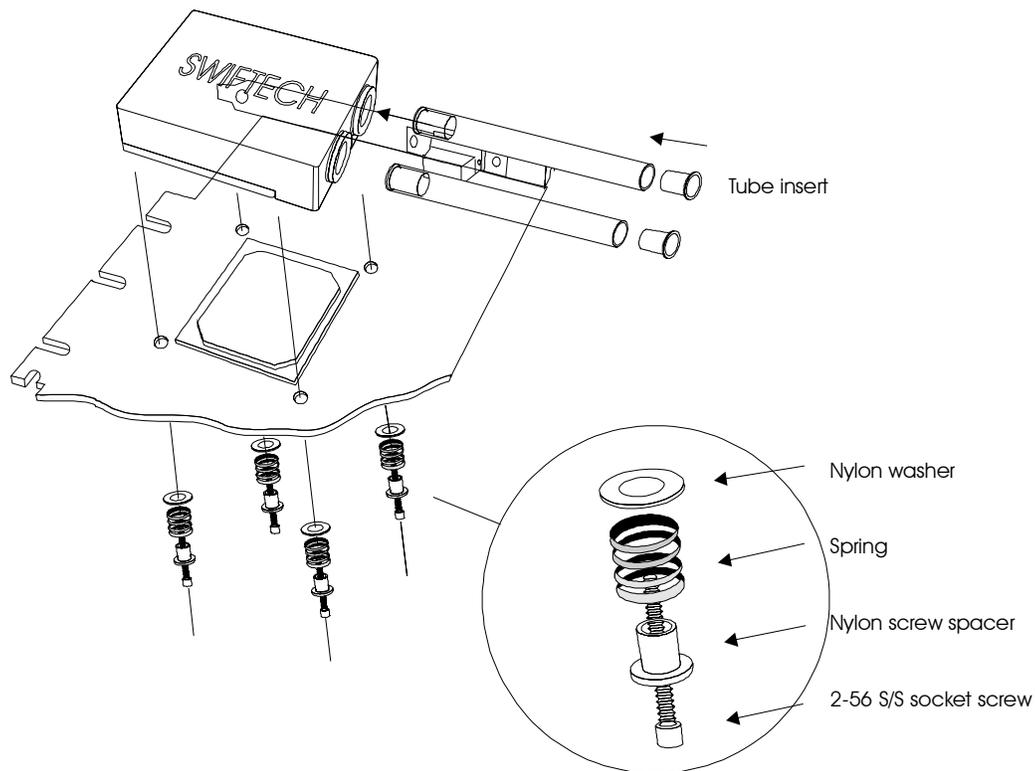
IMPORTANT WARNING: AMD compatible motherboards measure the CPU temperature via a thermal probe located inside the socket. The probe only measures the air temperature underneath the CPU. Motherboard manufacturers use mathematic formulas to extrapolate the actual CPU temperature. Such formulas use correction factors to account for airflow around the socket generated by a conventional heatsink fan cooler. In a liquid cooling environment, **there is no airflow** at all around the socket, since there is no fan attached to the water-block. This leads to erroneous readings from the motherboard thermal probe, which reports much higher CPU temperatures than actual. Troubleshooting help is available on our web site at <http://www.swiftnets.com> in the Service & Support section, Troubleshooting sub-section.

III. MCW40™ GPU Water-block Installation Guide

Parts list

Parts	QTY	PARTS	QTY
MCW40™ assembly	1	3/8" vinyl tubing	3'
2-56 S/S socket screw	4	Tube insert	4
Nylon screw spacer	4	Thermal compound	1
Nylon washer	4	Socket wrench	1
Spring	4		

Installation diagram



1. Preparing your graphics card

- Remove the existing heat sink
- Carefully clean the GPU (graphics processing unit)
- Lightly coat the GPU with the provided thermal compound. **Only a paper-thin coat is necessary.** It should be applied using preferably a razor blade, or a credit card, held between thumb and index at a 45-degree angle.

2. Installing the MCW40™ GPU Cooler

- The MCW40™ retention mechanism uses the four mounting holes standard specified in GeForce™ GPU's as shown in the schematic above. It can also be installed with other graphics processors by using permanent bonding agents, such as thermally conductive epoxies. We recommend Arctic Silver™ or Arctic Alumina™ epoxy.
- The MCW40™ can be oriented in any position, as needed to clear components on the board, except for one: the inlet and outlet should not be oriented towards the motherboard as the block would otherwise interfere with installation of the graphics card.

- c. If the graphics card comes equipped with memory heat sinks, it may become necessary to remove or replace the heat sinks with low profile after-market parts. To re-install these heat sinks, Arctic Alumina™ epoxy is recommended for optimum performance instead of thermally conductive tape.
- d. Note concerning **removal of the tubing**: Push in collet squarely against face of fitting. With the collet held in this position, the tube can be removed with a firm pull. Do not attempt to pull the tube out without pushing squarely against the collet. This may result in damaging the fitting. Further details for using quick-connect fittings are also available here: http://www.johnguest.com/install_6.shtml#disconnect
- e. Re-install the graphics card in the AGP slot, and proceed with filling and bleeding the cooling circuit. A mix of 75% purified water and 25% antifreeze is recommended

3. 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.

IV. Electrical Installation

The Quiet Power Case is equipped with an inline centrifugal pump operating on AC. In order to allow the pump to operate concurrently with the rest of the computer, the pump is connected to a relay switch as shown here:



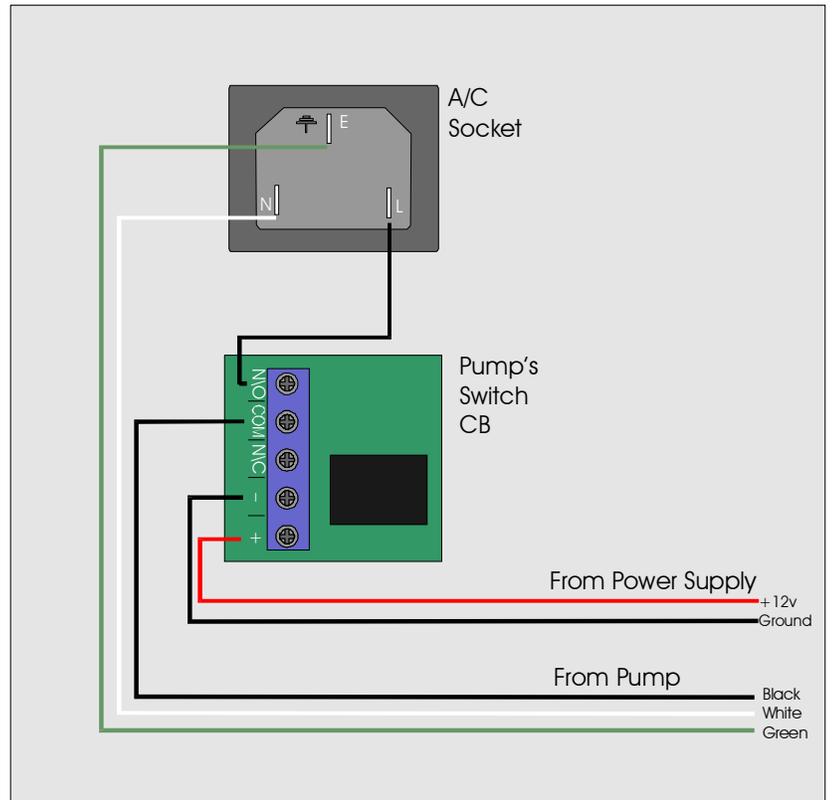
The relay switch MUST be connected to one of the power supply 4-pin connectors, AND the socket needs to be connected to an A/C source with the provided cord. OTHERWISE YOUR PUMP WILL NOT WORK !

Pump Relay switch operations

For normal operations, the L wire from the A/C socket is connected to the N/O (normally open) position of the switch. This means that when the computer is off, there is no current from the power supply to the switch, and the relay is opened, disallowing A/C to the pump. Conversely, as soon as you turn the computer on, the switch becomes energized by the power supply, and the relay closes, allowing A/C current to pass to the pump.

For maintenance operations, if you want to turn the pump on without operating the rest of the computer, you may temporarily connect the L wire to the N/C (normally closed) position. This is particularly useful for filling and bleeding the circuit, as you wouldn't want the computer running while the cooling circuit is not completely operational. **WARNING: do not forget to reconnect to N/O once you are ready to run the computer: if you leave the L wire connected to N/C, the pump will shut off as soon as the relay is energized by the power supply.**

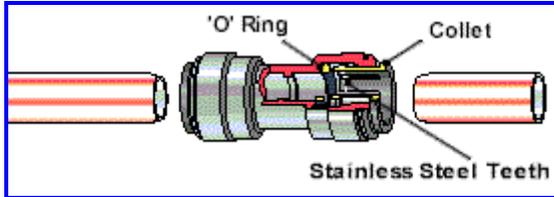
Relay switch connection diagram



V. Maintenance Operations

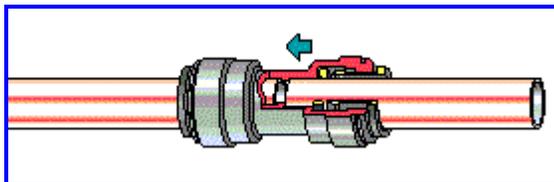
How to use quick connect fittings

1 Cut tube square



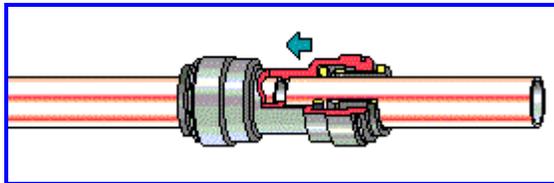
Cut the tube square. It is essential that the outside diameter be free of score marks and that burrs and sharp edges be removed before inserting into fitting. **For soft or thin walled plastic tubing we recommend the use of a tube insert.**

2 Insert tube



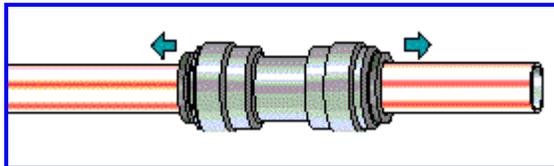
Fitting grips before it seals. Ensure tube is pushed in to the tube stop.

3 Push up to tube stop



Push the tube into the fitting, to the tube stop. The collet (gripper) has stainless steel teeth which hold the tube firmly in position while the 'O' ring provides a permanent leak proof seal.

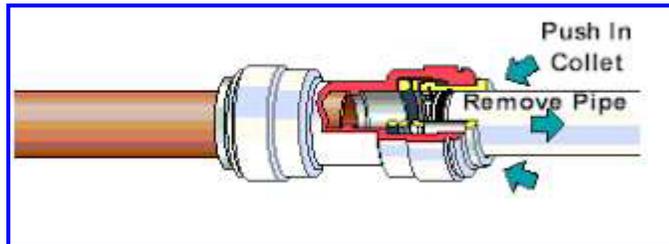
4 Pull to check secure



Pull on the tube to check it is secure. It is good practice to test the system prior to leaving site and/or before use.

Disconnecting a fitting

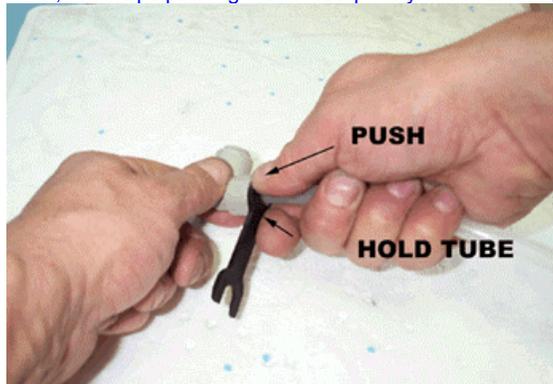
Ensure system is depressurised before removing fitting.



Push in collet squarely against face of fitting.

With the collet held in this position, the pipe can be removed. The fitting can then be re-used.

Your kit also contains a release aid tool which you can place over the collet, and helps pushing the collet squarely while removing the tube:



General guidelines with regards to tube bending:

In general, you should avoid sharp bends. A sharp bend may result in kinking the tube, and restrict or completely prevent the flow.

Once all the elements are in place, you can install your motherboard inside the case and proceed, with the water block installation.

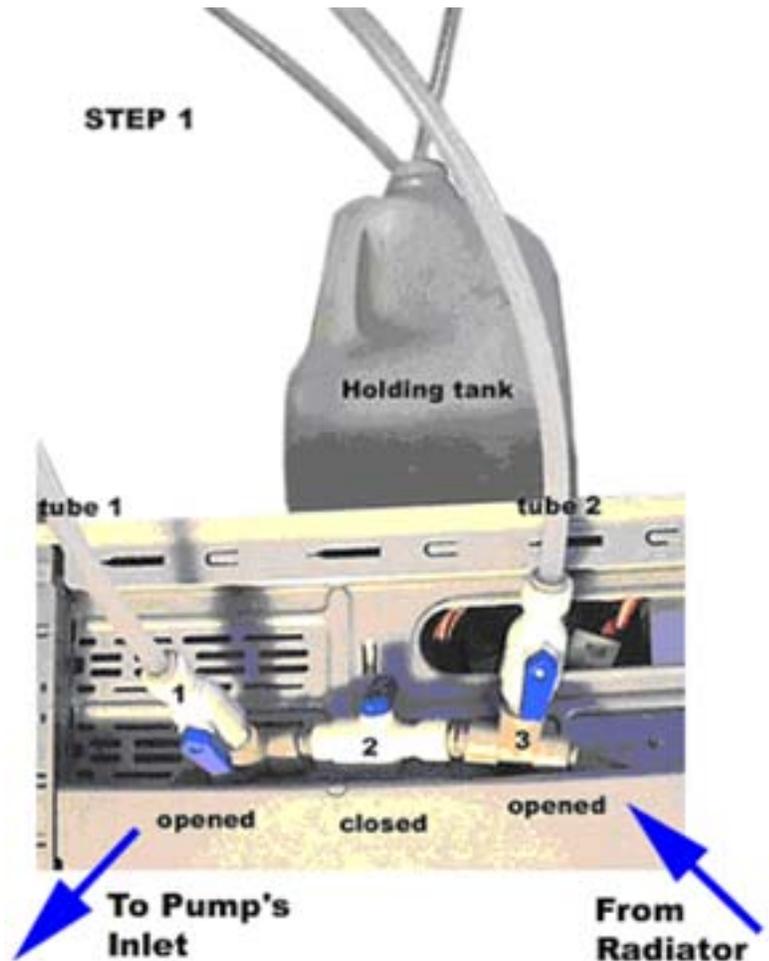
Filling & bleeding the circuit

We recommend using the following mix: 90% purified water, and 10% of one of the following products: Swiftech's specially formulated HydrX coolant, or RedLine water wetter, or Zerex Racing Coolant.

In order to fill and bleed the circuit, you will need to activate the pump. Since you do not want to run the computer until the cooling circuit is completely operational, you should temporarily connect the L wire to the N/C position of the switch. **WARNING: do not forget to reconnect to N/O once you are ready to run the computer: if you leave the L wire connected to N/C, the pump will shut off as soon as the relay is energized by the power supply, and there would be no flow in the cooling circuit, causing your CPU to overheat.**

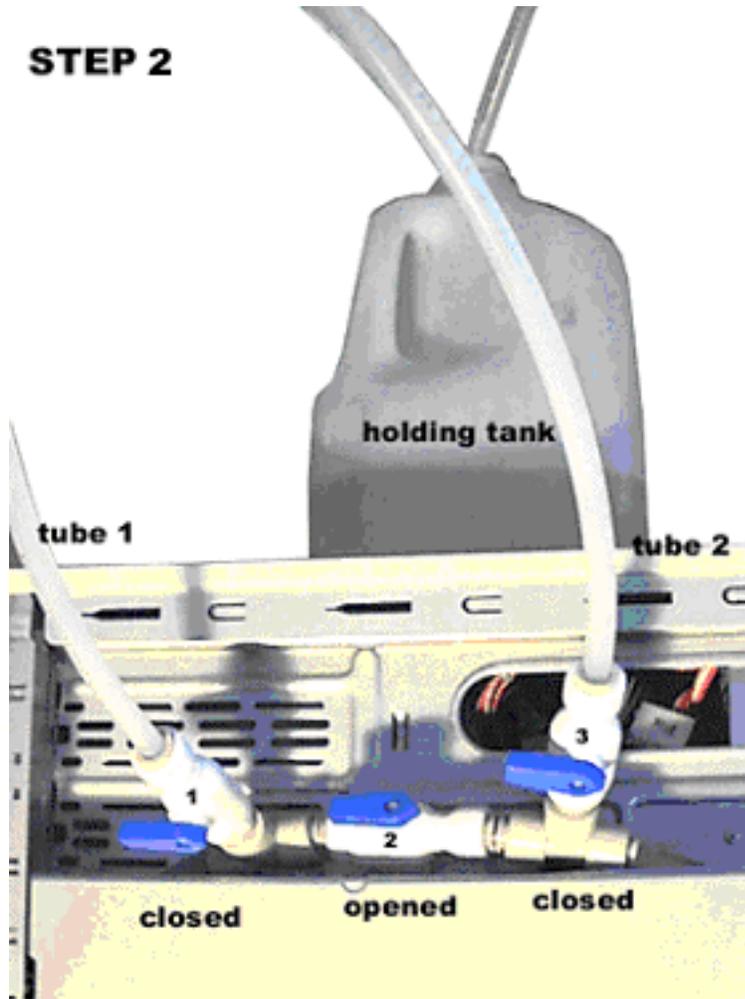
1. Place a holding tank containing your cooling fluid above the computer.
2. Connect the ¼" tube provided with your kit. Tube 1 goes to valve 1 and tube 2 goes to valve 3
3. Plunge tube 1 only into the holding tank, making sure it is entirely submerged
4. **Open valve 1, close valve 2, open valve 3**
5. Prime the circuit by gently sucking in air from **tube 2**, just enough that you see the liquid starting to flow down in tube 1
6. Now, you can plunge tube 2 back into the holding tank
7. Start the pump
8. Let the pump run for 1 minute as shown in the picture to the right. The liquid should be flowing freely from tube 2 into the holding tank.
9. **Important step: after a minute, and while the pump is still running:**

- **Take the holding tank and tubes into one hand – making sure that the tubes remain plunged into the liquid,**
- Then lay the computer down for just a few seconds once flat on it's back, and once flat on its belly. This will bleed any air still trapped into the circuit.



STEP 2

1. Open valve 2 for a couple of seconds, to allow air trapped into the valve to escape. Close valve again.
2. Now, close valves 3 and 1, and open valve 2. The system is now full, bled, and ready to use, as shown in the picture to the right.
3. Turn off the pump by disconnecting it from A/C.
4. With both tubes still inside valves 1 and 3, carefully place the holding tank below the computer (on the floor for example)
5. Disconnect the tubes from valves 1 and 3. Whatever little liquid was still trapped in the tubes will flow back into the holding tank without making a mess :-)
6. FINALLY, REMEMBER to reconnect the L wire from the socket to the N/O position on the switch !



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In summary

