H20-8501™
LIQUID COOLING KIT
TUTORIAL & INSTALLATION GUIDE

These instructions are also available with color pictures on our web site at http://www.swiftnets.com/Products/installation_guide_h20-8501.pdf

Check-marked for applicable model and content

Intel® Pentium® 3 Socket 370, AMD® Duron®, Athlon®, MP, XP socket 462		Intel® Xeon™ Processor, socket 603/604	
Intel® Pentium® 4 socket 478		Bare kit without water-block	
AMD® Athlon® 64 & Opteron®			

Qty	Item	Incl.	Qty	Item	Incl.
1	MCW5000-A™ CPU water-block, with retention hardware		2	Springs 0.375 OD x 1" long	✔
1	MCW5000-P™ CPU water-block, with retention hardware		1	FBK525™ assy. incl. (1) ½" fill & bleed kit, (2) 7/32-5/8" worm drive hose clamps	✔
1	MCW5000-PX™ CPU water-block to use with Intel® validated retention hardware provided with your CPU or motherboard.		2	2 ½ ft long ½" OD vinyl tubes for fill and bleed operations	✔
1	MCW5000-64™ CPU water-block, with retention hardware		1	MCP600™ 12 Volts DC industrial pump with retention screws	✔
1	MCR80-F1 radiator assy. incl. (1) Radiator, (1) 80x80x25mm fan, (1) fan guard, (4) #6 x 1 ¼" screws, (4) #6 x 3/8" screws, (2) 7/32-5/8" worm drive hose clamps	✔	7	Feet ½" OD high quality vinyl tubing	✔
1	1ft of ½" tube ID thick wall Clearflex tubing, (2) ½" to 3/8" barb nylon adapters	✔	1	2 oz bottle HydrX™ specially formulated coolant	✔

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Preamble

This kit has been designed to facilitate installation of the components with no modifications required to the chassis. It is however meant for advanced users, well versed in installing computer components.

General guidelines

- ❑ Never work with electricity connected to the computer while work is in progress.
- ❑ The fill and bleed kit should always be at the highest point of the cooling circuit (top 5 ¼" tray)
- ❑ While it is possible to install the kit in a chassis already populated with all typical components, such as hard drive, CD Rom, power supply, etc, it is always preferable and easier to work on a "naked" case, removing both side panels, front bezel, and top panel.

1. TUBE ROUTING

The following table is a guide on how to establish connections between the different elements of the cooling circuit, based on multiple possible configurations:

Devices: (1) Water-block + (1) Radiator + Pump + F&B kit						
Fill & bleed discharge serial to pump inlet	Pump discharge serial to CPU water-block inlet	CPU water-block discharge serial to radiator inlet	Radiator discharge serial to fill & bleed inlet – **Loop completed**			
Devices: (1) Water-block + VGA cooler + (1) Radiator + Pump + F&B kit						
Fill & bleed discharge serial to pump inlet	Pump discharge serial to CPU water-block inlet	CPU water-block discharge serial to VGA cooler inlet	VGA cooler discharge serial to radiator inlet	Radiator discharge serial to fill & bleed inlet – **Loop completed**		
Devices: (1) Water-block + VGA cooler + Chipset cooler + (1) Radiator + Pump + F&B kit						
Fill & bleed discharge serial to pump inlet	Pump discharge serial to CPU water-block inlet	CPU water-block discharge serial to chipset cooler inlet	Chipset cooler discharge serial to VGA cooler inlet	VGA cooler discharge serial to radiator inlet	Radiator discharge serial to fill & bleed inlet – **Loop completed**	
Devices: (1) Water-block + VGA Cooler + Chipset Cooler + (2) Radiators + Pump + F&B kit						
Fill & bleed discharge serial to pump inlet	Pump discharge serial to CPU water-block inlet	CPU water-block discharge serial to chipset cooler inlet	Chipset cooler discharge serial to VGA cooler inlet	VGA cooler discharge to Y connector for **PARALLEL** connection to both radiator inlets	Dual Radiator discharges to Y connector to fill & bleed inlet – **Loop completed**	
Devices: (2) Water-blocks + VGA cooler + Chipset cooler + (2) Radiators + Pump + F&B kit						
Fill & bleed discharge serial to pump inlet	Pump discharge serial to CPU water-block #1 inlet	CPU water-block #1 discharge serial to CPU water-block #2 inlet	CPU water-block #2 discharge serial to chipset cooler inlet	Chipset cooler discharge serial to VGA cooler inlet	VGA cooler discharge to Y connector for **PARALLE**L connection to both radiator inlets	Dual Radiator discharges to Y connector to fill & bleed inlet – **Loop completed**

1. Installation of the cooling components

The following is a typical sequence of components installation. Placement of the cooling components may vary depending on your case configuration.

1. **FBK525 Fill & Bleed installation**

The fill-and-bleed kit may be installed pretty much anywhere in the chassis, thanks to its flexible retention clip attachment system. A majority of users will find it convenient to install in a 5 ¼" bay.

TIP!

To simplify the bleeding process described in following chapters, the fill-and-bleed kit should preferably be installed at the highest point of the cooling circuit, such as the uppermost 5 ¼" drive bay.

Each clip will be attached to the chassis with the provided screws as shown in the example in Figure 1 below. A single screw is sufficient per clip.

Figure 1

The clip retention system accommodates a wide range of configurations, which will depend on the particular chassis, and users needs. For example, a rheobus can easily be installed in the same bay as the FBK525 as shown Figure 2 below: Another example in Figure 3 shows a "standard" setup.

Figure 2

Notice how each valve is only held by one set of jaws in this example

Figure 3
A "standard" setup

4. **MCR80-F1 Radiator installation**

The radiator/fan assembly fits into any exhaust opening designed to receive a 80mm case fan. Depending on the case design, the assembly will either fit straight up (inlet and outlet up), or may need to be rotated 90° as shown in Figure 4 Below:

Figure 4

Please use the separate installation guide provided with the MCR80-F1 radiator assembly to fasten the radiator to the chassis. If space permits, a second radiator can also be installed in parallel to the first one (see Figure 7).

3. **Install the MCW5000 water-block (s) on your CPU (s), the MCW50 on your VGA adapter, and the chipset cooler, if applicable.**

   Please follow separate instruction sheets provided with the product(s) for individual installation.

Figure 5

Here is an example of a mockup installation, showing the radiator in place, the CPU water-block, the graphics cooler, and the pump. With all the components located as such, all you need to do next **is cut the tubing to the appropriate length**, always keeping in mind to avoid sharp bends in order to prevent kinking of the tubes.

Position the pump at the bottom of the chassis. Do not peel-off the protective sticker yet. You may have to move the pump around later to have an optimal tube routing.

Figure 6

Figure 7

In the example shown in figure 7, we added a second radiator, installed in “parallel”. This term is used as opposed to a “serial” configuration where the outlet of the first radiator is connected to the inlet of the second. Here, the main line is split into two lines with a “Y connector. Each line feeds into the inlet of a radiator. Both outlets are then connected together as they rejoin the main line into a second “Y”. Such parallel configuration is mandatory to benefit fully from the addition of a second radiator, and will yield a performance improvement of 5 to 7°C.

Incidentally, notice in the background how the MCW5000 was rotated 90° to provide a more convenient routing for the tubing, a good example of the versatility of the MCW5000 retention system.

Your kit also comes with **(2) springs** that can be used to reinforce the tube when a sharp bend is absolutely necessary: It prevents the tube from collapsing (kinking), at the cost of a small flow rate reduction.

Figure 8

TIP! **In a tight loop such as this, you can even stretch the provided springs to create a larger radius!**

2. Fill and bleed operations

LEAK PROOF YOUR CIRCUIT BEFORE YOU FILL IT UP – DO NOT SKIP THIS STEP!

The following procedure is a convenient and safe solution to leak proof your circuit WITH ALL THE COMPONENTS ALREADY INSTALLED, BUT WITH NO LIQUID IN THE SYSTEM, thus avoiding any chances of spilling moisture on your valuable components, thanks to Swiftech's fill-and-bleed system:

CRITICAL TIP!

- ❑ Close the main valve as shown in Figure 8.
- ❑ Connect the 2 precut tubes that came with your kit to the inlet and discharge valves of the fill & bleed kit.
- ❑ Open either one of the inlet or discharge valves, and close the other.
- ❑ Suck vigorously on the open line to create a vacuum inside the circuit (see note*).
- ❑ Close the valve. You now have a circuit under moderate vacuum.
- ❑ Remove the tube from your mouth, and wait 30 seconds to a minute.
- ❑ Finally, obstruct the extremity of the tube with your thumb, and re-open the valve. Tube should adhere to your thumb as a result of the vacuum. This is evidence that your system is completely air tight, thus completely leak proofed ☺

*** Note:** The tubing we use is food grade, and as long as you clean it properly, it can be safely placed into your mouth.

Fill and bleed operations, step by step

Your kit comes with a 2 Oz (60ml) bottle of Swiftech's specially formulated HydrX™ concentrated coolant. The product should be mixed with demineralized water only. Simply empty the concentrated coolant into a 33 fl oz (1 liter) plastic bottle, and complete filling with your distilled water. Your coolant is ready.

Connect the 2 precut tubes that came with your kit to inlet and discharge valves of the fill & bleed kit, and set the valves as shown Figure 9. The extremity of the inlet tube should be pushed all the way down the bottom of the feed bottle.

TIP!

Note the orientation of the valve levers in Figure 9. Since the valves close clockwise, positioning the valves as shown here will orient the valve levers towards each other once closed, which is easier to reach if your case does not feature a removable top (see closed valve position Fig 14 page 7)

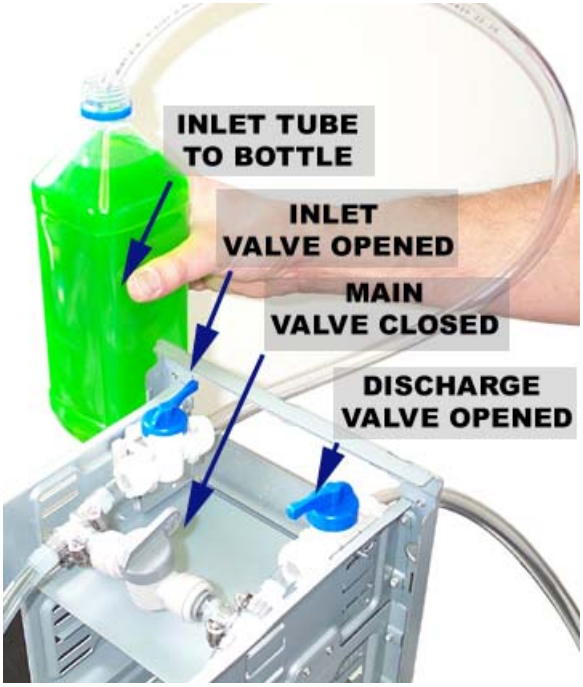


Figure 9

PRIMING THE CIRUIT

WARNING: DO NOT SKIP THIS STEP UNDER ANY CIRCUMSTANCE – Your pump is not self-priming, and the pump housing must be filled with fluid before you apply power.

Hold the feed bottle ABOVE the computer, and start gently sucking on the discharge tube to prime the circuit. Then place it back into the bottle. The coolant will start flowing down the inlet, and the circuit will fill-up by simple gravity

TIP!

Figure 10

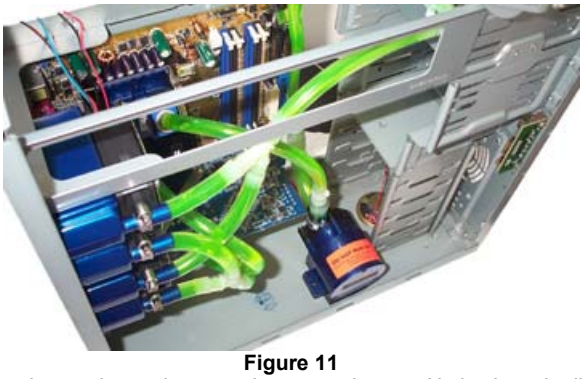


Figure 11
In the picture above, the pump is not running yet. Notice how the liquid filled-up the circuit by simple gravity

Now that the circuit is primed, make sure that your pump is connected to the power supply, then go ahead and power-up your computer.

The pump will start circulating the fluid throughout the circuit. Observe for a moment that the liquid flows vigorously from the discharge tube (Fig 12), and then submerse the tube down to the bottom of the bottle. Let the system run for about a minute.

Observe in Figure 10 that when you first start filling up the circuit, the portion of the line comprised between the two T connectors of the fill and bleed kit will retain a large bubble of air. To remove this bubble, simply open the main valve for a few seconds while the pump is running, and then close it again.

TIP!

Figure 12

Troubleshooting note: If there is no flow after you turned the pump on, chances are that you either didn't prime your circuit properly, and there is air in the pump housing, or you didn't connect your components in the correct sequence. Go back to the Tube Routing section, and make sure that you followed all our instructions. Once you have discovered the source of the problem, correct it, and restart the above process

TIP!

You must always flush all the liquid from the circuit before you begin filling or refilling it, otherwise you may not be able to bleed properly.

While your pump is still running, flip your case face up as shown figure 13 for a few seconds. This will allow all the air trapped in the radiator and other components to bleed out.

Then, bring the case back to vertical again.

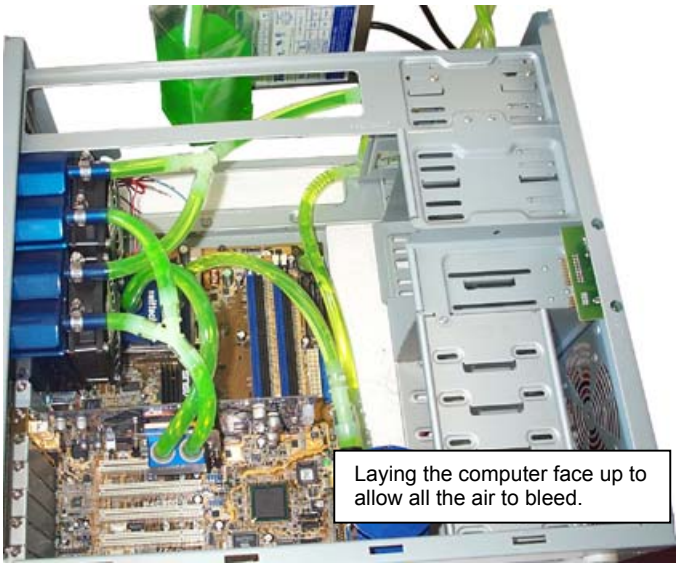
Open and close the main valve a few seconds one more time, just to allow any left over bubbles.

Visually inspect your lines for any traces of air, and if none are observed, close both inlet and discharge valves.

FINALLY, MAKE SURE TO RE-OPEN THE MAIN VALVE! FAILURE TO DO SO WILL PREVENT ANY CIRCULATION IN YOUR SYSTEM, AND CAUSE IT TO FAIL RAPIDLY.

Your system is now fully operational!

There will be no maintenance required, and no need to refill the system over time, as the circuit is completely air-free, and there is no evaporation of the fluid.



Laying the computer face up to allow all the air to bleed.

Figure 13

Final steps:

Lift the inlet, and discharge tubes from the bottle above the coolant level, and lower the bottle below the level of the computer. This will allow whatever coolant was trapped into the tubes to empty itself into the feed bottle: no spill, no mess ☺

Disconnect the fill and bleed tubes from the valves as shown figure 14. Removing tubes from quick-connect fittings is quite easy but takes a little practice. The FBK525 inlet and discharge valves feature two little “ears” on the collet, which ease the removal process**: Firmly hold the tube in the cradle formed by three fingers, and push against the ears with thumb and index fingers. This will disengage the tube from the fitting. Correct position of the hand and fingers is shown in figure 14.**

Finally, clean off the opening of the fittings to prevent the last remnants of moisture to drop into your case.

INSTALLATION IS NOW COMPLETE.

Disconnecting the fill and bleed tubes. The system is Go!

Figure 14

3. Draining the system:

Insert fill and bleed tubes into inlet and discharge valves. Plunge tube from discharge into an empty container. Close main valve. Open inlet valve. Clean off the extremity of tube from inlet valve and blow into it to flush the liquid out. Do not use compressed air to perform this operation, as it could damage your pump.

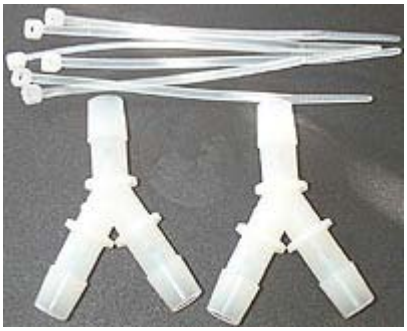
4. Available accessories

Improve performance with a second radiator:
MCR80-F1 Radiator assembly

Part # MCR80-F1, includes radiator, 80mm fan, retention screws, fan guard, clamps

For installation of radiators in parallel (highly recommended)

Add part # YFIT-3-8:



VGA Cooling

Please go to:
http://www.swiftnets.com/products/mcw50.asp for specifications

Part # MCW50

Chipset Cooling

Please go to:
http://www.swiftnets.com/products/mcw20.asp for specifications

Part # MCW20

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. Pump is guaranteed for 24 months. 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.

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