



Installation and operating instructions

We hope you enjoy using your new Innovatek water cooling system. Please read and follow the instructions below to ensure that the installation and initial operation goes smoothly.

Please shut your computer down and disconnect the AC power cable before working on it! If you are unsure about any of these instructions, please ask an expert for assistance or have the system installed by a trained technician.

But first a few basics about how a water cooling system works.

Basics:

A water cooling system is designed to cool the components (i.e. CPU, graphics board) of a computer system—just like conventional CPU or graphics board coolers. But unlike normal coolers with fans, a water cooling system uses a water circuit to absorb the heat generated by the computer's components. The water heated by components is pumped to a radiator that dissipates the heat into the surrounding air. The advantage of this system is the very large cooling surface of the radiator in comparison to the surface area of a normal CPU cooler's heatsink. This makes water cooling systems extremely efficient and quiet (depending on the radiator fan).

Preparing for the installation:

Please check to see that you have the following parts:

- CPU cooler block (with retainer and Allen key)
- radiator, including 120 mm fan and fan guard
- pump (Eheim)
- coolant reservoir with yellow cap and silver fitting
- about 2 m PVC tubing
- 1 silver screw fitting
- accessories: thermal compound, 7 V voltage adapter and cable ties
- this manual
- InnovatekProtect

You will also need the following tools and materials to install the water cooling system (depending on the installation version):

- a knife (to cut the PVC tubing)
- fastening materials as needed (adhesive tape or screws)
- a screwdriver or tool kit
- and of course: water (we recommend distilled water without additives)

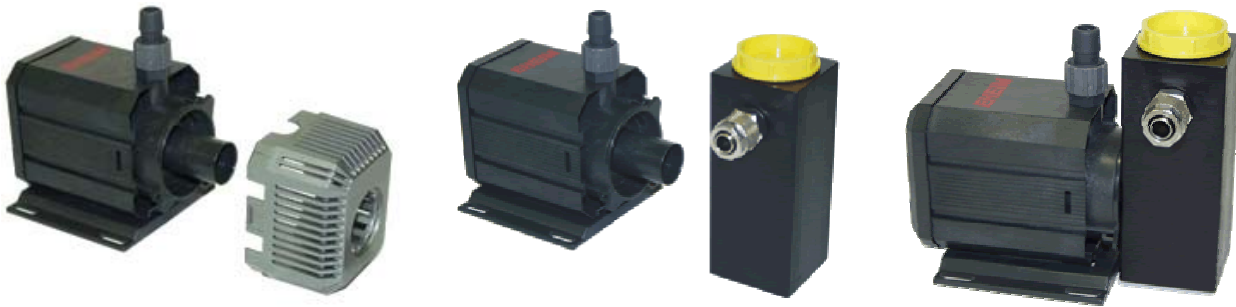
Installation overview:

First, an overview of the steps needed to install the cooling system in your PC:

Before starting with the installation of the cooling system, shut your computer down and disconnect the AC power cable!

Open the PC now and determine where you would like to install the individual components of the water cooling system: Normally, the pump is installed on the floor of the case. The radiator should have a direct connection to the outside and should therefore be installed in a (possibly already existing) fan opening of the case or another suitable location. The radiator fan must also be connected to the radiator. Replace the normal CPU cooler with the CPU water cooler block and connect it to the rest of the system. You should now be able to judge how you will have to cut the tubing later. To put the water cooling system into operation, create a closed water circuit joining the radiator, pump and reservoir, the CPU cooler block and the cooler block for the graphics board (optional) and fill the system with water. Use the tubing included for this purpose, cutting it to the proper lengths. All components are then connected in series. The order of the components is not important in this case. We recommend assembling the cooling system completely and testing it outside the computer before installing it in the PC. Once the system is working correctly, install the completely assembled system in your computer.

First, install the coolant reservoir on the pump. The existing pump-protection cap (optional) needs to be removed prior (to remove see picture 1). Slide the reservoir onto the pump with a twist from the front up to the stop.



This may be somewhat difficult due to the double seal.

Tip: Moisten the seals and intake.

Once the reservoir has been attached to the pump, install a suitable connector in the outlet of the pump (TOP). The screw fitting is in the accessory package. Screw the TOP connector into the pump, hand tight. Ensure that the seal goes cleanly into the opening and is not sheared off. The pump is now ready for the tubing.

At this point, connect all of the components with the PVC tubing and fill the system. Cut the tubing to the required lengths. Please note that you will need a bit more tubing in the case to prevent kinks and to give you enough leeway to install the system. Before the final installation, attach the radiator fan to the radiator with the included rivets. The direction and the side of the radiator depends on the installation situation. We recommend installing the radiator and fan so that air is blown out of the case, with the fan blowing through the radiator from the inside. Please connect all components so that they form a closed circuit: The outlet of the pump (TOP) with one side of the CPU cooler block; the other side of the CPU cooler block to one of the radiator connections. Connect the second radiator connection to the reservoir (graphics option: insert the graphics cooler block anywhere in the circuit). All components have screw fittings. First remove the locknuts from the fittings, slide them onto the tubing, push the tubing onto the connectors and secure them with the union nut. Now fill the system with distilled water and InnovatekProtect (please read the separate instructions for InnovatekProtect on the bottle). Open the yellow cap of the reservoir and switch the pump ON! (see The pump). With the pump running, slowly pour the distilled water-InnovatekProtect mixture into the reservoir until the water returns through the tubing to the reservoir. Repeat this process several times until there is no air left in the entire system. IMPORTANT: Air trapped in the radiator will have a negative effect on the cooling performance. Let the system run for several minutes to ensure that there are no leaks. Install the system in the PC, attaching CPU cooler block to the CPU and the radiator fan to the PC power supply. Please ensure that there are no kinks in the tubing and that the water can circulate freely. The blue angle connectors (in the accessory pack) can be useful here when routing the tubing around a very tight radius.

Tip: Be sure to retighten all screw connections after several days!

The pump

The system features a synchronous centrifugal pump. It draws its power from a 4-pin plug (HDD/CD drive power connector). The pump has a 1.2 m/head (HPPS-pump 1.6m/head) of water and a flow rate of 300 l/hr. The pump has a power consumption of 5 watts. It draws somewhat more power during the first 4 seconds to ensure proper starting. The somewhat increased noise level during this time is normal. After about 4 seconds, the pump switches to its regular operating mode. Please observe the following advice for the proper use of the pump:

- Do not immerse the pump. This may damage the pump's control electronics.
- Do not let the pump run dry. This can result in damage to the bearings, impeller or electronics. The coolant also lubricates the bearings and dampens the impeller's oscillations.
- The pump is intended for use with water or InnovatekProtect-water mixtures only. Other, nonapproved chemicals may damage the seals or bearings.
- Ensure a minimum pump flow rate of 0.3 l/min. A lower flow rate will result in premature wear. The flow rate can be monitored automatically with the Fan-O-Matic in conjunction with the flowmeter.
- Keep the pump at least 2 meters away from CRT monitors to avoid interference. The pump is not known to interfere with hard drives or other hardware. However, CRT monitors are by nature extremely sensitive to interference from weak magnetic fields.
- The pump cannot be controlled via the voltage. A drop of more than 10% from the required 12 V will cause the pump to shut off; more than 10% overvoltage can cause permanent

damage to the pump's electronics.

-Use only connections intended for this purpose. To prevent damage, make sure that the connections are only hand-tight. As the seal is not created by the faces of the connectors, excessive tightening will not improve the seal but may damage the threads.

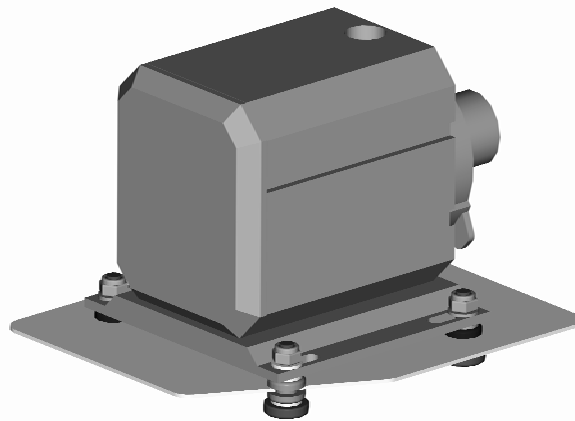
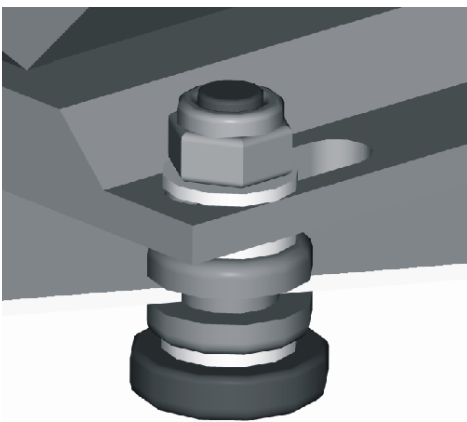
TIP for starting the pump WITHOUT the computer (when filling the cooling system): All sets with 12V pumps include an ATX plug (white plug with cable loop) that can be used to activate the power supply without starting the computer. Disconnect the power supply from the mainboard and connect the ATX plug to the end of the cable. The power supply will now start up and the system can be filled without booting the computer. Note: Do not start the power supply without connected consumers!

Pump installation

The included screw and decoupling set is designed to securely fasten the pump to the inside of the PC case while minimizing the transmission of vibration to the case.

Installing the pump:

Drill holes in the PC case in a suitable and reservoir into account. Drill one hole with a diameter of measuring 60 mm x 67 mm. Alternatively, you can also use the the rubber elements into the case the installation. After inserting the rubber elements, washer on top. Place the pump into and nuts. The nuts are self-locking deforming the rubber elements.



Tip: Some cases may require stronger decoupling measures. This applies especially to aluminum cases, which tend to amplify vibration considerably.

Radiator installation

Installing the fan:

The mounting holes on the radiator are designed for 5 x 10.5 mm fan screws or plastic rivets. Do not use longer screws or screws of a different type as they might damage the radiator. Place the fan on the radiator in such a way that the mounting holes of the fan line up with those in the radiator. With a screwdriver, turn the screw clockwise to the stop. Tools are not required to install the fan with plastic rivets. Position the fan on the radiator so that the mounting holes match, insert the rivet through the lower frame section of the fan and press the pin of the rivet in place to the stop.



Plastic rivets - general information:

Pressing the pin of the rivet into the body expands the body for secure retention. To release the rivet, pull the pin out and remove the rivet. Two fans are required for the InnovatekDUAL. When using an InnovatekDUAL radiator, please use two identical fans. When using undervoltage mode or a regulator, please use the same voltage for both fans or connect both to the same regulator connection using a Molex Y cable.

Radiator - general information:

Under normal circumstances, the radiator will perform best if the fan is set up to blow air into the radiator. Depending on your requirements, the fan can also be run with less than the standard 12V. For undervoltage mode, please use fans with ball bearings. The optimal installation position for the fan is in the upper area of the case, with the flow direction set to blow air out of the case. Always use InnovatekProtect in accordance with the instructions. Operation without adequate corrosion protection will destroy the radiator. Fan screws can also be used to fasten the radiator to the case. The radiator can be installed in any position in the cooling circuit. The installation sequence of the cooling components is not relevant; it is also not necessary to observe a specific flow direction for the individual components. The components may not be used in parallel (i.e. using Y connectors) under any circumstances, however. When filling the cooling system, ensure that no trapped air remains in the cooling circuit. This can easily be achieved by tilting the entire system while the pump is running. Air bubbles trapped in the components impair cooling performance and promote corrosion, so please take great care in this regard.

Note: The cooling system with its AGB-O-Matic reservoir can be turned by 180° (be sure to close the AGB first) to eliminate any trapped air pockets. An optional fan guard can be added after the installation is complete to protect against accidental contact (recommended).

General information on water cooling systems

Installing a water cooling system greatly reduces the amount of air flowing through the case, thus reducing noise levels. However, some components on the mainboard (northbridges) depend on the air flow from the CPU cooler. To ensure the trouble-free function of these components after the installation of the water cooling system, either replace the heatsink on the northbridge with a larger one or integrate it in the water cooling circuit. For cases with thick soundproofing that do not provide an adequate stream of cooling air to the hard drives, we also recommend integrating the hard drives into the cooling circuit (HD-Omatic cooler block).

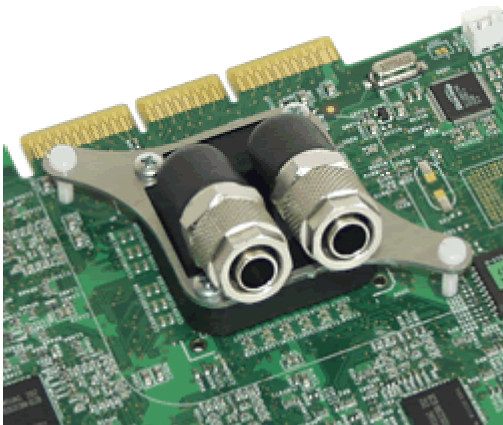
Installing the VGA cooler block (graphics chip cooler block) – optional

Preparation and installation

The graphics board will require preparation before installing the graphics chip cooler block. Remove the standard cooler from the GPU (graphics chip). These coolers are generally held in place by removable rivets that can be released by pulling the pins in the center of the rivets. For cards without mounting holes, coolers are glued to the GPU using thermal adhesive. Such coolers can only be removed by prying them off. Take great care to prevent damaging the board. After removing the original GPU cooler, carefully clean off the remaining thermal compound or adhesive and install the Graph-O-Matic GPU cooler block with new thermal compound. Apply a thin, sparing layer of thermal compound to form a minimal film between the cooler block and the GPU. Use the existing holes in the graphics board when installing the cooler block. If the holes of the graphics board do not match those of the cooler block's mounting bracket, replace the bracket. Remove the tubing connectors first, then remove the four M3 screws to release the bracket. When installing the cooler block, do not overtighten the screws—the board must not bend under the tension of the screws. For graphics boards without holes, glue the cooler block onto the GPU with thermal adhesive (not included).

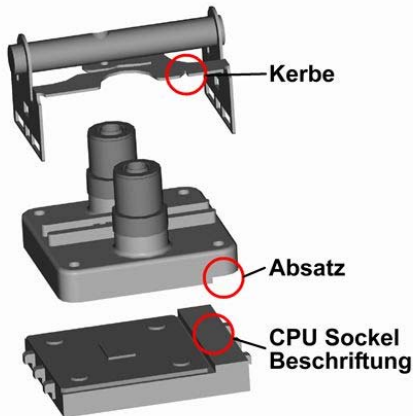
General information

Integrating the graphics board in the cooling circuit will ensure the effective cooling of the GPU. Other components on the graphics board need air circulation for cooling, however. Especially the RAM chips on the graphics board should be equipped with heatsinks (if not already present). A wide range of suitable heatsinks are available from specialist retailers (e.g. Alpha RAM heatsinks).



Installing the CPU cooler block

Remove the mainboard from the case and place it on an ESD-safe surface (e.g. the inside of the mainboard foil packaging). Be sure to observe the relevant precautions to prevent electrostatic discharge when removing and handling the mainboard. Place the retainer and cooler block in the correct position in relation to the socket. Use thermal compound to ensure optimal heat transfer to the cooler block. Apply a small dot of thermal compound, about the size of a match head, to the center of the die. The thermal paste will be spread by the clamping of the cooler block. For details of the assembly, please see the following illustrations.

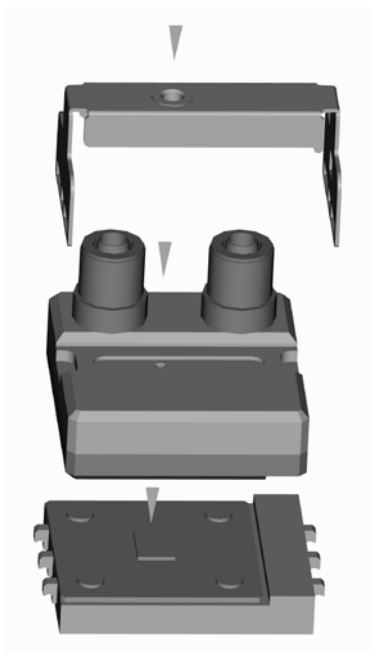


Flatflow - AMD Socket A

Please ensure that the notch and the step of the cooler block are positioned on the correct side of the CPU socket as shown. After the tabs on the socket snap into place, tighten the clamp with the included Allen key (HAND TIGHT). The cooler block is now mounted securely to the CPU.
1 = notch, 2 = step, 3 = CPU socket label

InnovatekCOOL Rev3 and Plex-O-Matic - AMD Socket A

The CPU cooler block is attached to the socket itself. Press the cooler block and retainer onto the CPU until the 6 tabs snap into place. Gently tighten the knurled screw at the top handtight. The cooler block is now mounted securely to the CPU.



Flatflow SL, X-Flow XX-Flow - AMD Socket A

Place the retainer and cooler block in the correct position in relation to the socket. The tightening screw of the retainer, the centering of the cooling block and the CPU die must all be aligned with one another. (On the XX-Flow and Flatflow SL, the position is between the central webs of the four small transverse webs.) To tighten the clamp, fix it at the outside (squeeze together). Turn the clamp screw clockwise to the pressure point (approx. 3 Nm). The final pressure is reached by turning the screw around 90° to 120°, or around 1/4 to 1/3 turn, past the pressure point. Tightening the screw past this point will increase the pressure enormously and may damage the processor.

Intel P4 socket 478 general information

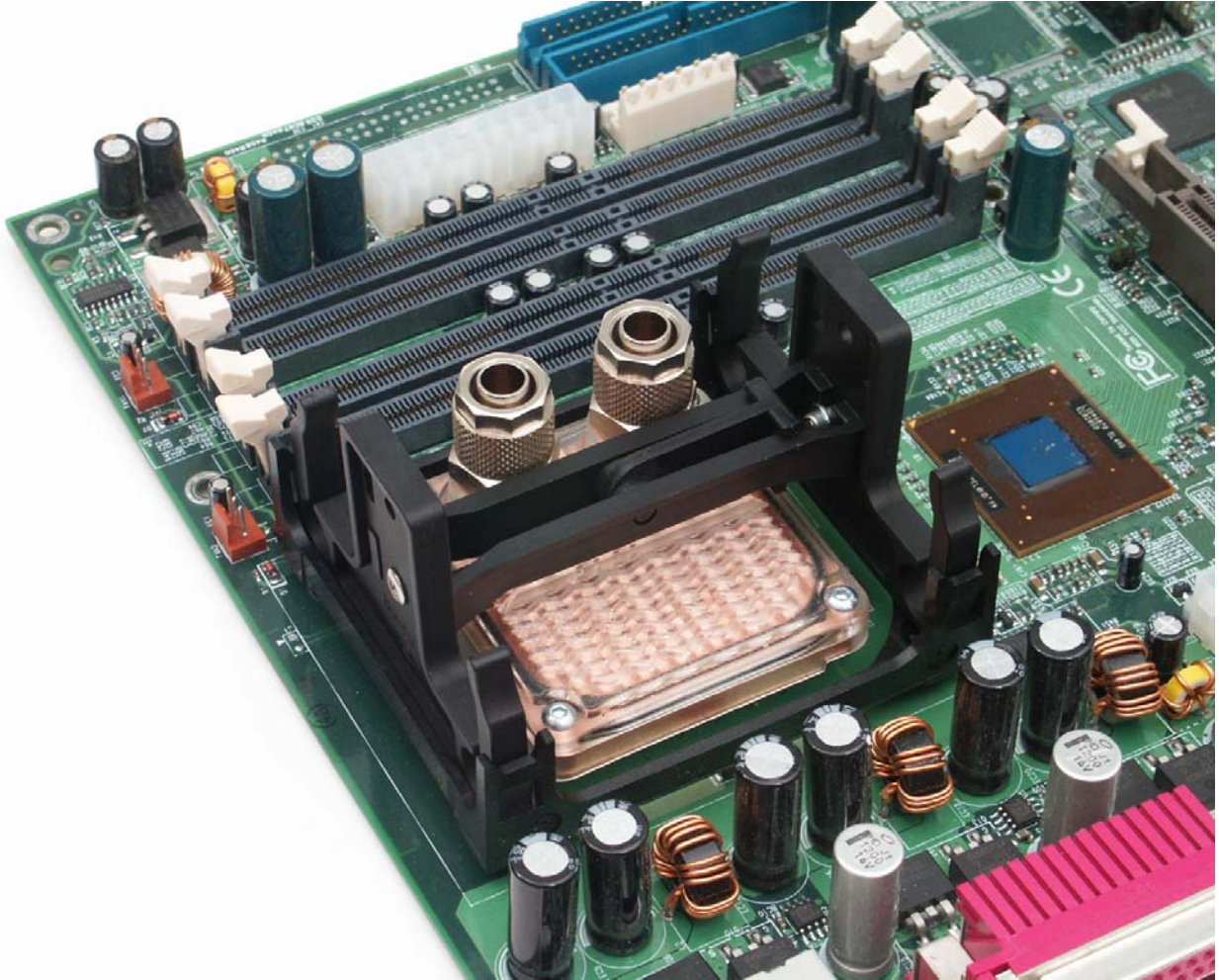
Remove the mainboard from the case and place it on an ESD-safe surface (e.g. the inside of the mainboard foil packaging). Be sure to observe the relevant precautions to prevent electrostatic discharge when removing and handling the mainboard. Place the retainer and cooler block in the correct position in relation to the socket.



Use thermal compound to ensure optimal heat transfer to the cooler block. Apply the paste sparingly. The thermal paste will be distributed by the clamping of the cooler block. Place the unit on the CPU and snap it into the retention module (black plastic frame around the processor) with the holder open (clamping lever up).

Please note: All 4 retention points must snap into place and the guides of the retainer must engage the groove in the cooler.

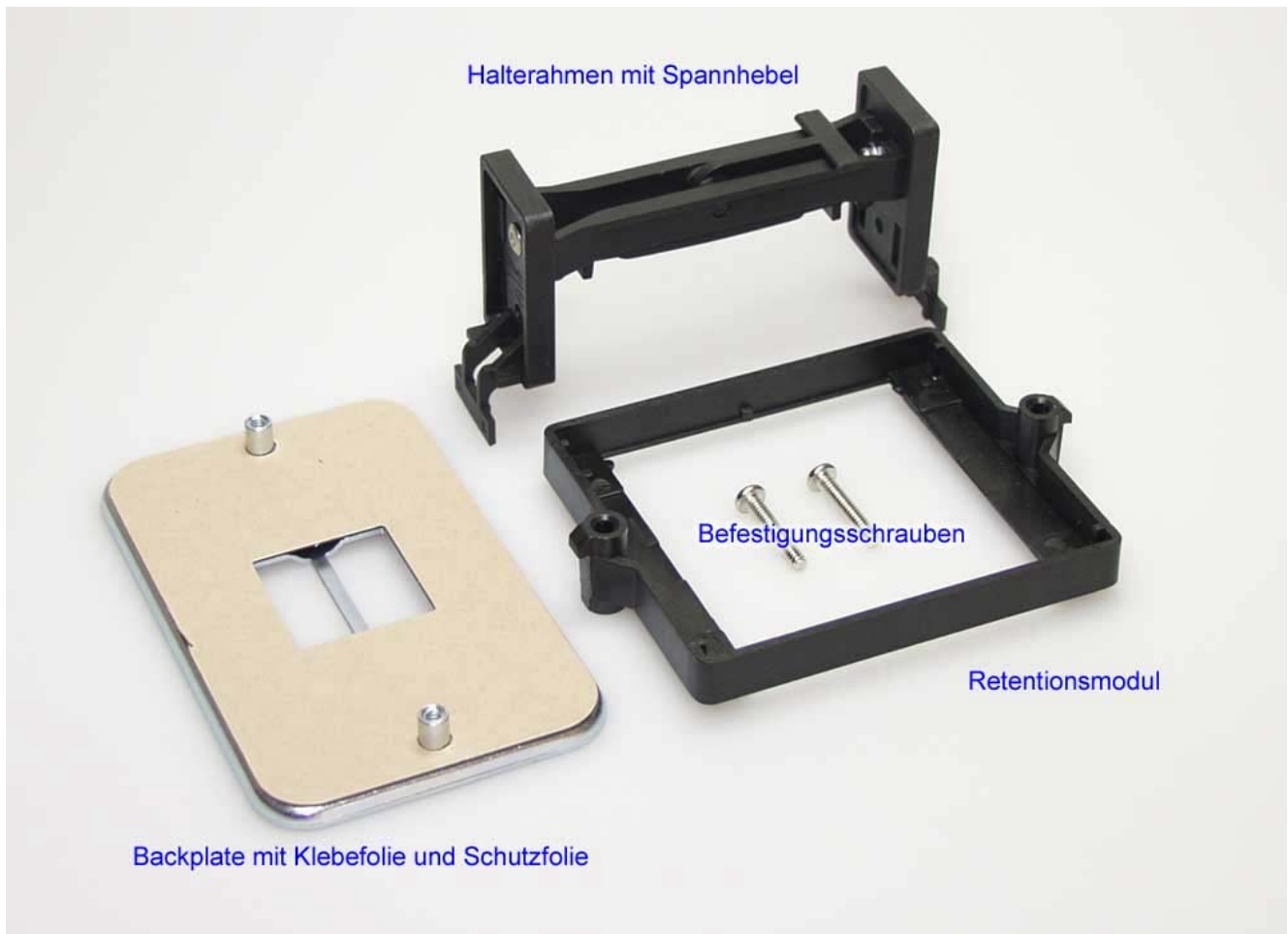
To clamp the assembly into place, press the lever up to its stop. Attention: Both of the hold-down nozzles need to engage properly as well as the tracks of the mounting bracket need to align with the intended mounting groove on the cooler (Flatflow/X-Flow/XX-Flow/InnovatekCOOL Rev.4). As there is no mounting groove on the InnovatekCool Rev.3 and Plex-O-Matic, these coolers only need to be placed centric. To tighten you need to push the lever into its hold-down position.



AMD Athlon 64 und Athlon 64 FX socket 754/940

Remove the mainboard from the case and place it on an ESD-safe surface (e.g. the inside of the mainboard foil packaging). Be sure to observe the relevant precautions to prevent electrostatic discharge when removing and handling the mainboard. The mounting bracket consists of 3 components (see picture). For proper mounting please first remove the protective cover from the Backplate. Align and glue the plate so that the threaded bolts will fit through the existing holes of the backside / flipside of the mainboard. Afterwards the frame (Retention module) needs to be mounted on the CPU-side of the Mainboard. To do so, please use the included two screws by evenly tightening them moderately handtight. Attention: Both of the hold-down nozzles need to engage properly as well as the tracks of the mounting bracket need to align with the intended mounting groove on the cooler (Flatflow/X-Flow/XX-Flow/InnovatekCOOL Rev.4).

As there is no mounting groove on the InnovatekCool Rev.3 and Plex-O-Matic, these coolers only need to be placed centric. To tighten you need to push the lever into its hold-down position.



Place the retainer and cooler block in the correct position in relation to the socket. Use thermal compound to ensure optimal heat transfer to the cooler block. Apply the paste sparingly. The thermal paste will be distributed by the clamping of the cooler block. Place the unit on the CPU and snap it into the retention module (black plastic frame around the processor) with the holder open (clamping lever up).

