89.20.1121

SilentDrive Thermal and Acoustic Enclosure for Hard Drives

Features and Benefits

- Silences Hard Drive Noise
- High Consumer Acceptance
- Maintains Drive Operating Specifications
- No Performance Degradation
- Fits In Standard 5.25" Bay
- Easy Assembly Into PC Chassis

Applications

- Multimedia/Entertainment
- Audio/Video Production
- Programmers
- SOHO
- Education
- Libraries
- Reservation Desks
- Hospitals

SilentDrive™

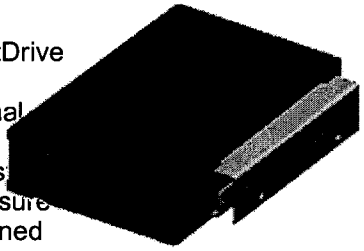
Specifications (Typical values unless otherwise noted.)

Parameter	Value	Units
MECHANICAL		
. Weight	18.6 526	Ounces Grams
. Enclosure Material	ABS	
. Enclosure Material Rating	UL 94V-0	
. Acoustic Barrier Foam Material Rating	UL 94V-0	
. Decoupling Foam Material Rating	UL 94HF-1	
COMPATIBLE DRIVES		
. Disk size	3.5	Inches
. Drive height	1 2.54	Inches Cm
. Maximum spindle speed	5400	RPM

Discussion of Drive Compatibility

The acoustic performance of SilentDrive is compatible with all available hard disk drives. SilentDrive is also compatible with all 3.5" hard disk drives with a maximum height of 1" (2.54 cm). The limiting factor in SilentDrive's

General Description



SilentDrive is a thermal and acoustic enclosure designed to reduce the noise of a hard drive by >90% while still maintaining the drive's required ambient operating temperatures. A dense acoustical barrier and a thin decoupling foam line the inside of the enclosure and prevent the transmission of noise outside the enclosure. Thermally conductive cold plates transfer the heat generated by the hard drive inside SilentDrive's enclosure to the ambient air within the PC chassis. SilentDrive can be installed as original equipment by PC manufacturers or retrofitted into existing PCs by end users.

For reference, the typical noise level in a quiet room is 28dBA. The noisiest of hard drives, in the 36 to 38 dBA range, will be quieted to just below 30 dBA while others will be quieted to 28 dBA or less. (Note that a 3 dBA reduction equates to a 50% reduction in noise.)

Product Highlights

1. **Silences Hard Drive Noise.** The hard drive emits noise generally between 1 and 3 kHz, the most sensitve range of the human ear. Eliminating this noise with SilentDrive allows PCs to be used as a 24 hour appliance without intruding into the user's enviorment
2. **Maintains Dive Operating Specifications.** Thermally conductive aluminum plates ensure that the hard drive's operateing temperature requirements are met, with no degradation in performance, under elevated temperature and load

compatibility with hard disk drives is the maximum heat dissipated by the drive.

SilentDrive has the thermal capacity to cool hard disk drives that dissipate up to 5W of heat. However, drive manufacturers do not readily specify the heat dissipation of their drives. Therefore, Silent Systems has established the drive's spindle speed as a proxy for heat dissipation. SilentDrive is specified to operate with hard drive spindle speeds of up to 5400 rpm. Whether the hard drive is an IDE or SCSI type is not relevant to the heat dissipation limitation. However, most SCSI drive spindle speeds are higher than 5400 rpm and therefore are not generally considered compatible with SilentDrive.

conditions in a host PC.

3. **Fits In Standard 5.25" Bay.** SilentDrive installs easily into any standard 5.25" bay of a PC. The product comes complete with all required mounting hardware.

Ordering Information	
Part Number	**Description**
37047-0001	ABS, UL 94V-0 rated enclosure

Click Here for SilentDrive **installation instructions** (as shown on Quietpc.com).

For ship quantities below 500, visit our U.S. distributor site, **New England Digital**
Visit our European distributor at **www.silentpc.nl**

SilentDrive™ Installation Instructions

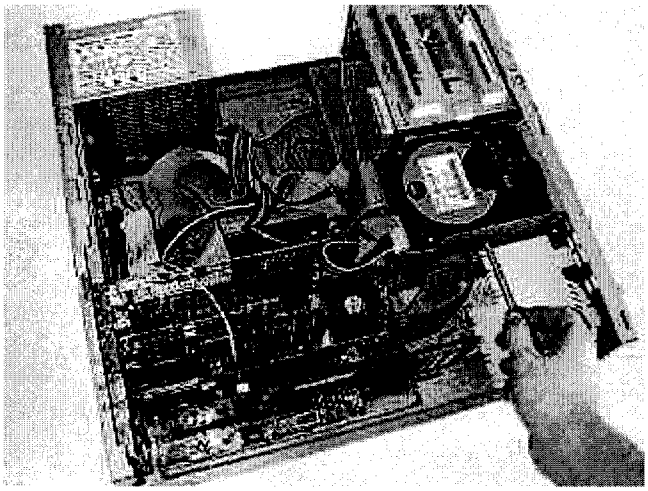
Revision 1.5 © 2000 Quietpc.com

These instructions will tell you how to install your SilentDrive™ acoustic drive enclosure in an easy-to-follow manner. If you are used to taking the lid off your PC, you should find the installation reasonably straightforward. You may like to print out these instructions so you can refer to them while you are upgrading your machine. However, if you are in any doubt as to your own skill in PC hardware installation then for the safety of yourself and your PC, please ask an expert engineer to do the work for you! These instructions are for guidance only and no responsibility or liability can be borne by Quietpc.com for damage or loss incurred, (including data loss) howsoever caused, either directly or consequentially.

In order to determine compatibility with your own particular hard drive, we supply a temperature-sensitive label which you should affix to the surface of your hard drive. This is important because it shows how hot the hard drive becomes while enclosed in the SilentDrive™. Instructions are given below on how to use the label and interpret the result it shows. You should take time to use the sticker provided to verify your hard drive will not be liable to overheat inside the SilentDrive™. A hard drive which runs in excess of the manufacturer's specified maximum temperature may fail prematurely.

Most manufacturers specify a maximum operating temperature of around 55-60°C, and links to manufacturer's websites are given at the end of the instructions so that you can check your own particular drive. Please note we cannot accept responsibility for failed drives, so you should use the temperature label to be sure that your drive will be safe.

IMPORTANT: Before starting, backup the data on your hard drive. You should do this regularly in any case, as hard drives are never 100% reliable and total data loss can be disastrous if no other copy exists. The hard drive is at a higher than normal risk of failure due to accidental damage while a PC upgrade is in progress. Right, lecture over, now on with the installation!



1. Getting Started

Unplug all cables from the PC and place it on a clean work surface with plenty of room for manoeuvre. Do not work on a carpet, (especially not a carpet containing nylon), as static electricity can damage electronic components. If you have an anti-static wristband then wear it. Remove the case cover and locate the hard drive. Be sure to make a note of how the ribbon cable is attached to the drive. Note the position of the red stripe on one side of the ribbon cable relative to the hard drive power connector (normally the stripe will be nearest the power connector). Having done this, unplug both the ribbon cable and the power connector from the hard drive.

Carefully unscrew the hard drive mounting screws and remove the drive from the chassis, taking great care not to drop it or knock it against any hard surface - hard drives are extremely fragile! Keep the screws safe as you will need them to mount the SilentDrive™ enclosure later on. Do not touch any

printed circuit board (PCB) either on the hard drive itself or on any other board within the computer, since any static electricity in your body could cause unseen internal damage to the components on the PCB.

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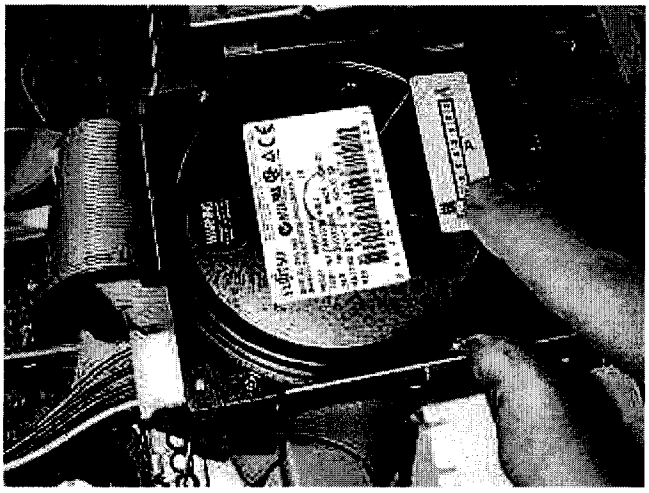
2. Checking the temperature



Next, apply a temperature-sensitive sticker (supplied) to a clean grease free surface on the hard drive casing (not on any part of its PCB). This sticker will indicate the maximum temperature reached on the surface of the drive casing. The sticker is marked with 37, 40, 43, 46, 49, 54, 60 and 65°C. A colour change from white to black shows that particular temperature has been exceeded. The colour change is irreversible.

At this point, you may wish to replace the hard drive and run the machine for a couple of hours to find out what the normal running temperature of the drive is before installing your SilentDrive™. If you wish to do this then now is the time! You should replace the computer's case cover while testing to ensure an accurate result is obtained. Make a note of the result before going on to the next step because this temperature will be surpassed on the sticker display by the higher temperature reached when the drive is installed inside the SilentDrive™.

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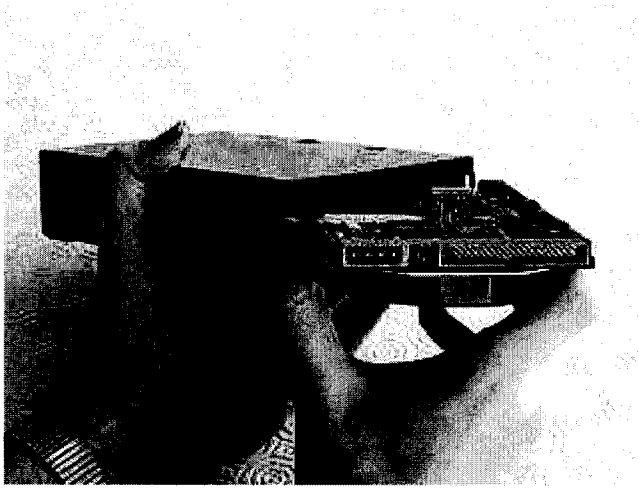
3. Insert drive



Peel off the packing tape from the SilentDrive™ and remove the cap stored inside it, leaving the enclosure empty. Carefully slide the hard drive into the enclosure, with the sockets facing the open end. To begin with, insert one corner of the drive in order to open up the aluminium plates inside. Once a corner is in, you can slide the corner toward one side, opening up the plates still further and allowing the whole drive to enter.

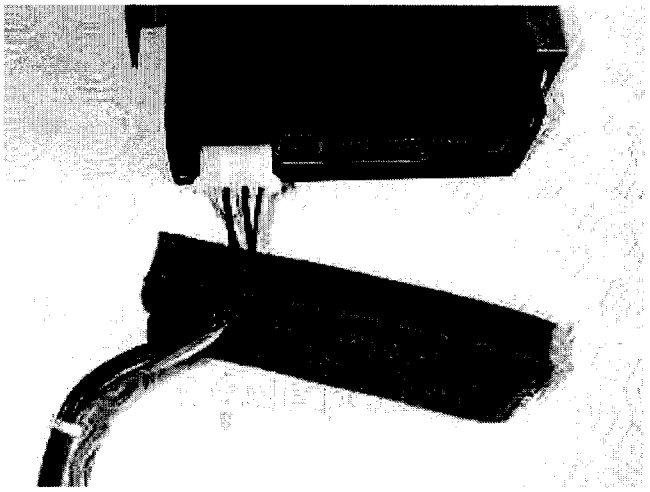
Push the whole drive inside very slowly, making sure that the metal plate adjacent to the PCB side of the drive does not catch any raised components or connectors as the drive moves inward. You should orient the drive as shown in the picture, which may seem "upside-down". However this is not a problem since hard drives are designed to be run in any orientation as long as they are mounted either completely horizontally or vertically (not at a slant).

Optionally, you can use two screws to secure the drive inside. The SilentDrive™ enclosure has holes cut in the correct position on one side (you can see these holes in the photograph,

at the far edge). However, it is usually best not to use these screws because the drive fits very tightly as it is, and cannot really move anywhere. Screws will increase the vibrations transmitted from the drive into the SilentDrive™ and therefore the noise level will also increase. The only time you would use screws here would be if you are very concerned about securing the drive as firmly as possible, such as when doing an installation in a vehicle for example.

4. Prepare the foam

The foam which fits between the drive and the SilentDrive™ cap has a rectangular cutout in it to allow the power connector to fit correctly. Ensure this hole has been fully pressed out and discard the small cutout inside it.



5. Install the SilentDrive™

At this point, you should mount the SilentDrive™ complete with hard drive in your PC chassis - you will need a 5.25" drive bay to mount it in, similar to a CDROM bay. Use the screws you removed in step 1. Ensure the hard drive does not fall out while you are mounting the unit! In the interests of clarity, this picture and the three following pictures were taken with the SilentDrive™ still out of the PC chassis, but in reality you will be working inside the PC from now on.

Place the foam with the silver side nearest the drive and with the hole next to the power connector hole on the hard drive. Then pass a power connector through the hole in the foam and plug it in. It helps if you are able to use a power connector for the drive which is at the end of a chain of connectors, rather than in the middle - this means that only four wires need to pass through the SilentDrive™ cap, not eight! This is not essential, but if you can do it, it means the cap will not require as much force to clip it on.

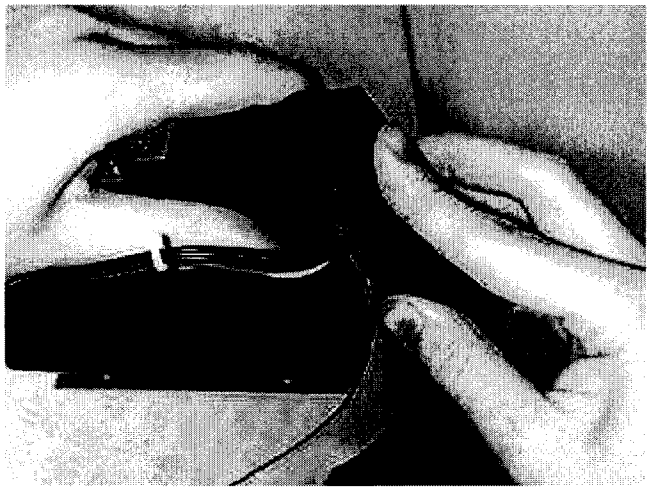
TIP: Sometimes it can be fiddly trying to do the installation inside your PC. Why not use a "wye" cable splitter to connect into your hard drive, then you can install the hard drive inside the SilentDrive™ on your desk (with the data cable disconnected from the motherboard).

Once the cap is on, simply slide the assembly into your PC and connect the wye and data cables. Easy!

6. Insert the cable and foam

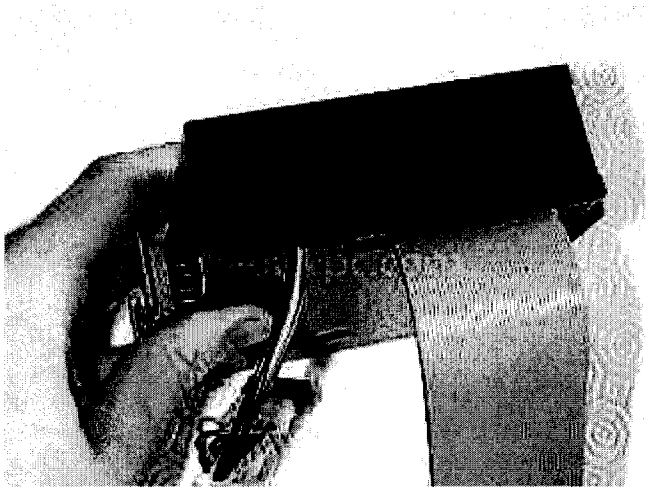
Connect the ribbon cable into the drive making sure it is the right way round, (as noted in step 1). Often there is a plastic lug on one side of the connector which will prevent incorrect insertion, but some connectors have this lug missing leaving orientation open to error. You should ensure the red edge of the cable goes into the same side of the drive as it did when you removed it. Then press the foam fully into the SilentDrive™, ensuring it fits tightly all the way around the back of the drive and the power connector. This is essential otherwise the cap will not clip on.

Be sure that the plugs are firmly seated in their sockets before continuing. This is the last chance you will have to check them and if they're not properly connected, your hard drive will not work.



7. Apply the cap

Look carefully at the cap and you will see that the lugs at one side are larger than at the other. Put the cap on at an angle so that the largest lugs fit into the holes first at one side, then slowly close the cap and press firmly at the other side. As you do this, ensure that the cables are exiting correctly through their holes in the cap and are not trapped. You may need to feel whether this is the case if they are not visible when in the PC chassis. The cap will pop on when a fair amount of force is applied in order to compress the foam inside.



8. SilentDrive™ installed

This is the finished article. Note that both cables exit correctly through the small cutouts in the plastic cap and are not trapped in any way. Your own SilentDrive™ probably won't be as easy to see as this since it will of course be installed in the PC at this point, (unless you follow the "wye connector" tip described in step 5!). Now you have finished, you should replace the PC case, plug everything back in and make sure it all works. Enjoy the silence!

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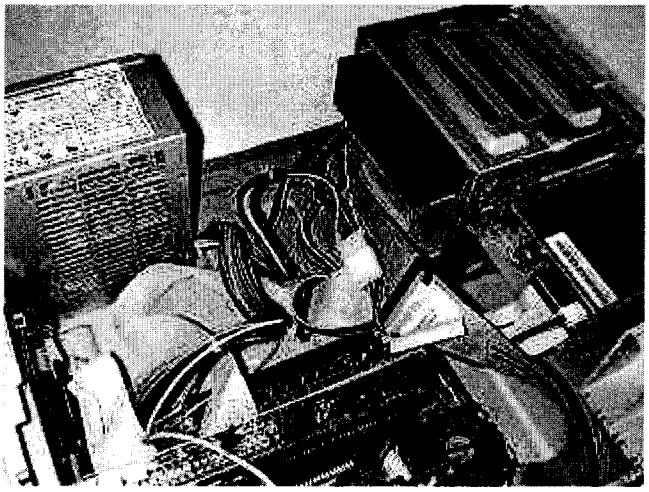
9. Final temperature check



All you have to do now is to check the drive does not overheat. Run the PC for an hour and then turn it off. Open the PC and pull off the SilentDrive™ cap (this may require some force). Pull the hard drive out far enough to examine the temperature-sensitive sticker. If you can't do this then disconnect the cables and remove the hard drive completely.

If the highest blackened temperature shown is significantly less than the maximum temperature specified by the manufacturer (say by 10°C), you have nothing to worry about. If it is close to the manufacturer's maximum temperature you may wish to run the drive for another couple of hours and then look again, to ensure you are reading the temperature when the drive has fully warmed up. If the indicated temperature is greater than the manufacturer's specified maximum, then we recommend you abort the operation and return the SilentDrive™ for a refund, or use a different hard drive. However, very few hard drives exceed the manufacturer's running temperature while enclosed in a SilentDrive™.

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10. How to read the maximum temperature reached

This is a close-up shot of a temperature-sensitive sticker which has been attached to a hard drive enclosed in a SilentDrive™ and allowed to run for a couple of hours to get up to temperature. You can see that this sticker has had the lower two boxes turned black, which indicates that the temperature of the drive surface has reached a temperature of between 40° C and 43°C.

Most manufacturers quote a maximum running temperature of around 55-60°C, so the drive to which this particular sticker has been attached is in no danger whatsoever of overheating.

If you would like to check the temperature which the manufacturer quotes for your particular hard drive, try looking on the manufacturer's website. For your convenience, here are some links to the most popular manufacturers. You should try searching for the model number of your hard drive, and then viewing the technical specification or datasheet, which should list the maximum running temperature.

Fujitsu Hitachi IBM Maxtor Quantum Samsung Seagate Western Digital