

Instructions for Using the Hard Disk

Thank you for supporting Pro-face products.

Every hard disk has an estimated life span.

Continuous operation of the hard disk for 24 hours or repeated access to the hard disk in a short period of time may result in a higher incidence of problems or unstable operation.

To ensure stable operation for a longer period, observe the instructions described in this document.

Since the hard disk is comprised of precision mechanical parts, it is the most fragile component in this product. Use extreme caution regarding the handling method and operating environment.

Life Span

The hard disk is comprised internally of precision mechanical parts and uses weak electrical signals to record data.

Since the expected life span of the hard disk varies considerably depending on the handling method (impact and static electricity) and operating conditions (temperature, humidity, vibration and operation time), it is regarded as a consumable component.

The incidence of problems may increase depending on the operating conditions, even within the maintenance period. To maintain the stability of the hard disk for a longer period, refer to the following basic specifications.

The hard disk life span is estimated to be whichever is reached first of the following three periods. (The expected life span may be shorter than the following periods depending on the operating conditions.)

- (1) 5 years
- (2) Power-On Hours:
20,000 or 30,000 hours, depending on the hard disk. Please refer to the hard disk's installation guide for details.
- (3) Head loading/unloading frequency:
600,000 times (Number of reciprocating motions)
 - Loading
This operation moves the head from the return position onto the disk.
 - Unloading
This operation returns the head from the disk to the return position. If the hard disk is not accessed for 15 seconds, the head will automatically return to the return position to protect the disk.

[Reference example]

When the hard disk power-ON duration is 11 hours/day and the disk is accessed

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every two minutes, the loading/unloading frequency is approximately 120,000 times/year. In this case, the expected life span is approximately 5 years.

Continuous Rotation of Hard Disk Motor

Continuous operation of the hard disk motor causes rotation jitter^{*1}, which makes data R/W (read/write) processing unstable.

Continuing in such a condition disables R/W processing, which may result in system shutdown.

To avoid this problem, make the settings for the power-saving function of Windows[®] so that the hard disk motor can stop for the specified time.

NOTE

- The rotation of the hard disk motor can be stopped by using the power-saving function of Windows[®] when the hard disk is not accessed for the specified duration of time. When the hard disk is accessed, the motor automatically rotates, enabling normal access to the disk. Therefore, this function does not affect the system operation.

*1 Minute vibration attributable to various factors during rotation

24-hour Continuous Operation / Frequent and Continuous Access to Hard Disk

If the hard disk is operated continuously for 24 hours, or frequently and continuously accessed, pay attention to the following points:

- (1) If the same sector on the hard disk is repeatedly used for R/W processing, the head will be retained in the same track or sector on the disk without moving over the disk, resulting in uneven coating on the disk surface. This causes a positioning error, disabling the R/W processing. However, this problem will not occur in normal Windows[®]-based operation. If you specify continuous use of a certain track or sector in DOS, the following problems may occur.

[Possible problems]

- The hard disk has a fault.
 - The system does not start.
 - The system hangs up.
 - Touch operation is disabled.
 - The system restarts.
 - Operation speed lowers.
- (2) Frequent and continuous access to the hard disk shortens the hard disk life span, because the allowable head loading/unloading frequency is 600,000 times.
Even if the hard disk has not reached the end of its life span, the hard disk operation may become unstable due to its own heat generation. Furthermore, incidence of rotation jitter increases, causing head positioning errors. On rare occasions, the hard disk cannot perform normal R/W processing.
 - If this problem occurs, turn off the hard disk power supply and then turn it on again after at least 10 minutes have

elapsed. The hard disk will be restored to the normal operating condition.

- The above problem will not necessarily occur with your hard disk. The incidence of the problem varies considerably depending on the operating conditions. To avoid this problem, reduce the frequency of accessing or stop the motor for 10 minutes or longer during each 24-hour operation period, so that the hard disk can operate stably at all times.

Possible problems vary depending on the application being used. Particularly in continuous data R/W processing at intervals of 10 to 20 seconds the incidence of problems will increase.

Vibration / Impact

Of all the panel computer components, the hard disk is most vulnerable to vibration and impact. Most hard disk problems are caused by vibration or impact.

Generally, the vibration resistance and impact resistance guaranteed by the hard disk manufacturer is “4.9 m/s²” and “147 m/s²” respectively. (For exact values, refer to the manual for each product.)

Since the head of the hard disk is always moving at a distance of approximately 0.01 to 0.02 μm from the disk surface, it must be handled carefully.

Particularly when the hard disk is in operation, the head moves above the data area being used. Therefore, if an impact is applied to the hard disk, the disk surface may be damaged.

The panel computer cannot be used in a system that may vibrate during operation. Never attempt to move the system with the panel computer power supply turned ON.

- (1) Keep any system or control panel that includes this product free from vibration.
- (2) If a system or control panel that includes this product is transported, vibration or impact may be applied to the product during transport, causing a failure or problems in the product.
 - Pack the product in a dedicated container and transport it separately.
 - Before mounting the product in a system, first install the system.
- (3) If the product is mounted in a movable table or system, vibration or impact is applied to the product when it is moved, causing a failure or problems in the product.
 - Never attempt to move the system when the product is in operation.
 - When moving the system during a stoppage, specifically when crossing a

cable on the floor or a groove, be careful not to apply impact or vibration.

Temperature / Humidity

Generally, as the operating temperature increases, the life span of electrical components, as well as that of the hard disk, will be shortened. If the hard disk is installed in a limited space in a control panel, take precautionary measures to prevent a temperature rise. To install the hard disk in an enclosed control panel that gathers heat, provide a fan for the control panel.

A rapid temperature change causes condensation in the hard disk. Be-cause of the condensation, the head sticks to the disk, which may result in a disk rotation failure. For example, if the hard disk is moved into a warm room immediately after transportation, or if the hard disk operation is stopped in a cold site, the temperature in the hard disk rapidly changes, causing condensation.

Furthermore, a rapid change in temperature or atmospheric pressure causes the lubricant to be vaporized and adhere to the head. Also, a similar phenomenon may occur in the case where the hard disk is left unused for a long period. Never attempt to blow air with excessive force directly into the air hole of the hard disk. Such an action rapidly changes the internal pressure and easily causes the above phenomenon.

For Protection of the Hard Disk

- (1) Scan disk or error check recommendation
Periodically executing the scan disk or error check processing can minimize data damage attributable to an application.
- (2) Shut down recommendation
To turn off the Windows[®] system power supply, execute the shut down procedure. If you turn off the power switch directly, data may be lost and Windows[®] may not restart properly.
- (3) Data backup recommendation
As the minimum preparation for using the system safely, have a spare hard disk with the same software.
You may notice an indicator of a problem before the problem actually occurs with the system. For example, abnormal motor sound, slow response to touch operation, and extremely slow processing of the system are warning signs. In such cases, it is best to make a backup before turning off the power supply. Once the power supply is turned off, the system may not restart properly.
- (4) Periodic replacement recommendation
Since the hard disk is a consumable component, it must be replaced periodically. To prevent sporadic system problems, it is recommended that the hard disk be checked periodically.

Countermeasures Against Hard Disk Problems

To ensure safe use of the product, Pro-face has taken the following measures to cope with possible problems.

- (1) Hard disk drive unit provides shock-absorbing structure.
To minimize influence of impact, the hard disk drive unit is protected with shock-absorbing rubber.
- (2) Recommendation of Windows[®] XP Embedded OS
Windows[®] XP Embedded OS pre-installed CF cards are commercialized for more environmentally-enhancing system.
- (3) Soft mirror (Option)
The optional soft mirror function can duplicate system data to prevent data loss.
- (4) Cartridge type (Specified models only)
Availability of cartridge type hard disks allows you to exchange the hard disk drive unit easily, if a problem occurs.
- (5) Hot-swap function in hard disk drive units
When the hot-swap function is used with the soft mirror function, hard disks with problems can be exchanged while the system is in operation.

Hard Disk Installation / Replacement

To prevent damage and injury, take the following precautions when installing or replacing hard disks.

- (1) Do not install or replace hard disk drive units while power is supplied to the system. (Hard disk drive units can be installed or replaced when the soft mirror function is used with the hot-swap function.)
- (2) Since hard disks are vulnerable to vibration or impact, they must be handled carefully.
- (3) Hard disks are electronic components. In installation or replacement of hard disks, take a countermeasure against static electricity. (e.g. Wearing an earth-band or a ground strap)
- (4) Do not touch the metal cover on the disk surface. Touching it may cause a failure.

Inquiry

Do you have any questions about difficulties with this product?
Please access our site anytime that you need help with a solution.

<http://www.pro-face.com/otasuke/>

- Note

Please be aware that Digital Electronics Corporation shall not be held liable by the user for any damages, losses, or third party claims arising from the uses of this product.

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