



# Installation guide

## Travelstar 25GS, 18GT, & 12GN

ATA/IDE



Model:   DARA-225000   DARA-218000  
          DARA-215000   DARA-212000  
          DARA-209000   DARA-206000

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### Introduction

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Thank you for purchasing an IBM advanced-technology Travelstar hard disk drive. By purchasing this drive, you acknowledge the following:

- you have read and agreed to the conditions listed on the ShopIBM Web site
- you are a system integrator with the necessary knowledge to install IBM DARA-2xxxxx hard drives
- you understand that the system into which you will be installing the IBM DARA-2xxxxx drive must be capable of supporting hard drives of 8 GB or greater capacity with or without BIOS upgrades

For successful installation please note the following:

- The drive must be left in its protective anti-static bag and shipping box until you are ready to install it.
- Retain the shipping box and all packaging materials after installation. This box has been designed to ensure safe shipment of the drive.
- This drive does not come with any installation screws, brackets, cabling, or software. You may need special brackets and other items to successfully install this drive.

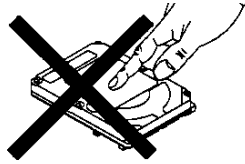
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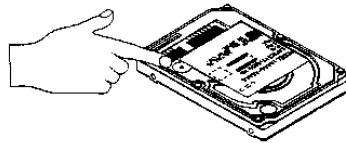
## Handling precautions

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- Do not apply pressure on the drive during handling or installation.



- Do not cover the breather hole! Covering the breather hole may result in loss of data.



- Always handle the drive with care to prevent damage from shock, vibration, or electrostatic discharge.
- Handle the drive carefully by the edges. Do not touch any exposed printed circuit board.

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## **BIOS settings for DARA-225000, DARA-218000, DARA-215000, DARA-212000, and DARA-209000**

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**IMPORTANT:** Please read this entire BIOS settings section before you begin installation.

Before you begin installation, make sure that the system into which you will be installing this drive has a BIOS capable of supporting a hard drive of 8.4 GB or greater capacity. Some older system BIOS may have difficulty recognizing a drive of this capacity and configuration at initial power on. Some BIOS may simply need to be upgraded in order to accept a hard drive of 8.4 GB or greater capacity. There are software programs, such as Disk Manager, that can help upgrade the BIOS by replacing the disk drive driver software of the system BIOS with a software driver that will allow the system to function with drives of larger capacity. A software program such as Disk Manager installs the driver which enables use of the full capacity of the drive. The Disk Manager software program can be downloaded from the IBM Web site at the following address:

<http://www.storage.ibm.com/techsup/hddtech/welcome.htm>

If you are unsure about the capability of your system BIOS to support this hard drive, you may download Disk Manager onto a floppy disk before you begin drive installation.

### If the system allows BIOS access

If the system allows access to its BIOS settings, set the disk drive setting in the BIOS to AUTO.

### If the system boots up but does not support or properly recognize the new drive capacity

Some older BIOS will allow the system to boot up but not recognize a drive of 8.4 GB or higher capacity. Some BIOS will allow the system to boot up but will only recognize the drive as having a very low capacity. In this case, you may download the Disk Manager software program from the IBM Web site address shown above, to replace the disk drive driver software of the system's BIOS with a software driver that will allow the system to use the drive's full capacity.

### If the system locks up and will not boot up

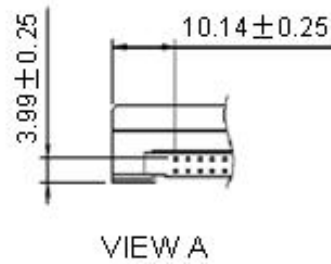
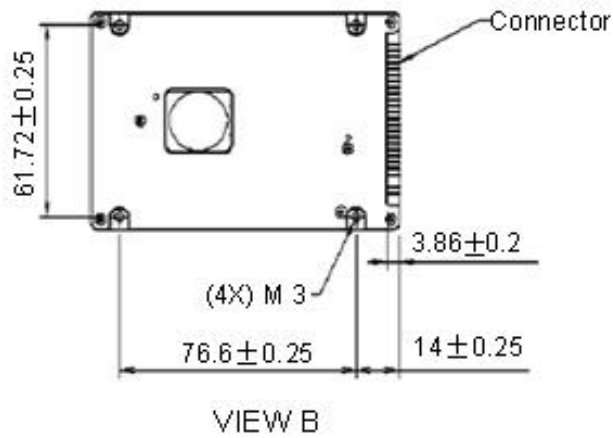
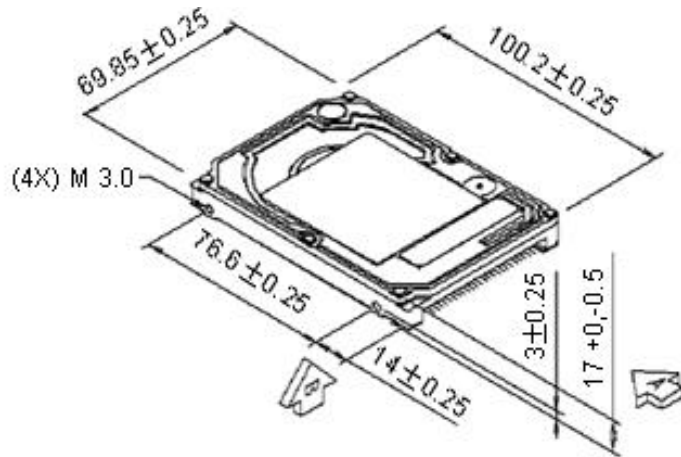
Some older systems do not recognize hard drives with 16 heads. In this case, as the system integrator/ drive installer, you may either upgrade the system BIOS to accept a 16-head drive or install a drive of lower capacity.

Customers who experience problems installing this drive in a system may contact

IBM Technology Group Support Center  
888.426.5214 (toll-free in the United States) or 507.286.5825  
[drive@us.ibm.com](mailto:drive@us.ibm.com)

## Mounting hole location

The location and size of the mounting holes are shown below. All dimensions are in millimeters unless noted otherwise.



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## Mounting orientation

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The drive will operate in all six (6) axes. The drive will operate within the specified error rates when tilted  $\pm 5$  degrees from these positions. Performance and error rates will stay within specification limits if the drive is operated in the other permissible orientations from which it was formatted. Thus, a drive formatted in a horizontal orientation will be able to run vertically and vice versa.

The recommended mounting screw thread length is 3.0 mm for bottom mounting and 3.5 mm for horizontal mounting.

The system integrator is responsible for mounting the drive securely using appropriate screws or equivalent mounting hardware to prevent excessive motion or vibration of the drive during seek operation or spindle rotation.

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## Environmental characteristics

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	Operating Conditions	Nonoperating Conditions
Maximum wet bulb temperature	29.4°C (non-condensing)	40.0°C (non-condensing)
Temperature range	5 to 55°C	-40 to 65°C
Maximum temperature gradient	20°C per hour	20°C per hour
Altitude	-300 to 3,000 m (10,000 ft)	-300 to 12,000 m (40,000 ft)

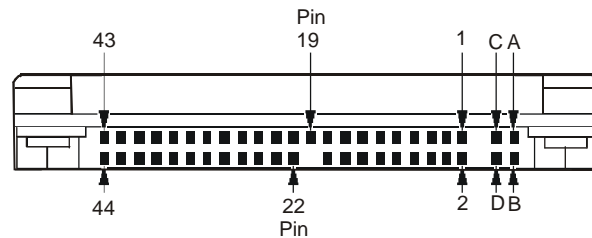
The system must provide sufficient air movement to maintain a surface temperature below 60°C at the center of the top cover and below 63°C at the center of the card of the drive.

Refer to the separate data sheet enclosed with this disk drive for additional specifications.

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## Interface connector

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**Note:** Pin position 20 is left blank for correct connector insertion. Pin positions A, B, and D are used for drive address setting.

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## Operating mode at power on

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The device goes to idle mode after power on or hard reset as an initial state. Initial state may be changed to Standby mode using pin C on the interface connector.

**Signal definition**

The pin assignments of interface signals are listed in the following table:

PIN	SIGNAL	I/O	Type	PIN	SIGNAL	I/O	Type
01	-RESET	I	TTL	02	GND		
03	DD07	I/O	3-state	04	DD08	I/O	3-state
05	DD06	I/O	3-state	06	DD09	I/O	3-state
07	DD05	I/O	3-state	08	DD10	I/O	3-state
09	DD04	I/O	3-state	10	DD11	I/O	3-state
11	DD03	I/O	3-state	12	DD12	I/O	3-state
13	DD02	I/O	3-state	14	DD13	I/O	3-state
15	DD01	I/O	3-state	16	DD14	I/O	3-state
17	DD00	I/O	3-state	18	DD15	I/O	3-state
19	GND			( 20 )	Key		
21	DMARQ	O	3-state	22	GND		
23	-DIOW( *	I	TTL	24	GND		
25	-DIOR( *	I	TTL	26	GND		
27	IORDY( *	O	OD	28	CSEL	I	TTL
29	-DMACK	I	TTL	30	GND		
31	INTRQ	O	3-state	32	-HIOCS16	O	OD
33	DA01	I	TTL	34	-PDIAG	I/O	OD
35	DA00	I	TTL	36	DA02	I	TTL
37	-CS0	I	TTL	38	-CS1	I	TTL
39	-DASP	I/O	OD	40	GND		
41	+5V	power		42	+5V motor	power	
43	ground			44	(reserve)		

**Notes:**

1. "O" designates an output from the Drive.
2. "I" designates an input to the Drive.
3. "I/O" designates an input/output common.
4. "OD" designates Open-Drain output.
5. The signal lines marked with (\*) are redefined during the Ultra DMA protocol to provide special functions. These lines change from the conventional to special definitions at the moment the Host decides to allow a DMA burst if the Ultra DMA transfer mode was previously chosen via SetFeatures. The Drive becomes aware of this change upon assertion of the -DMACK line. These lines revert back to their original definitions upon the deassertion of -DMACK at the termination of the DMA burst.

	Special definition (for Ultra DMA)	Conventional definition
Write operation	-DDMARDY	IORDY
	HSTROBE	-DIOR
	STOP	-DIOW
Read operation	-HDMARDY	-DIOR
	DSTROBE	IORDY
	STOP	-DIOW

6. "Power" designates a power supply to the drive.
7. "Reserve" designates reserved pins that must be left unconnected.

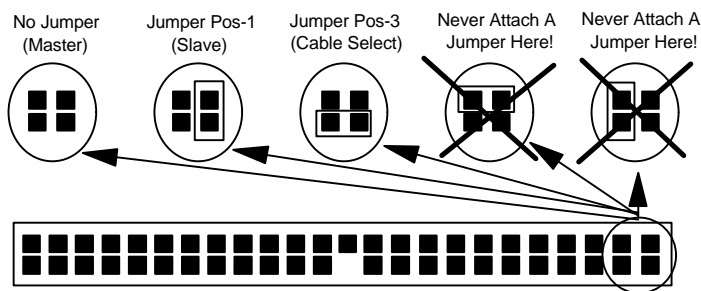
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## Setting the drive address

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The drive address is determined by the placement of jumpers on the pins on the right side of the interface connector as shown below. The default setting at shipment is for Device 0.

If Cable Select is chosen, the drive address depends on the state of pin 28 (see illustration on page 3) of the AT interface cable. If pin 28 is ground or low, the drive is a Device 0. If pin 28 is open or high, the drive is a Device 1.



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## Data loss on power off

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- The drive retains recorded data under all non-write operations.
- No more than one sector can be lost by power down during write operation while write cache is disabled.
- Power off during a write operation may create an incomplete sector which will report a hard data error when read. The sector can be recovered by a rewrite operation.
- A hard reset does not cause any data loss.

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## Electromagnetic compatibility

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The drive, when installed in a suitable enclosure and exercised with a random accessing routine at maximum data rate, meets the following worldwide EMC requirements:

- United States Federal Communications Commission (FCC) Rules and Regulations (Class B), Part 15.
- European Economic Community (EEC) directive number 76/889 related to the control of radio frequency interference and the Verband Deutscher Elektrotechniker (VDE) requirements of Germany (GOP).

IBM will provide technical support to assist users in complying with the EMC requirements.

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## Safety

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This product does not contain any known or suspected carcinogens.

This product meets or exceeds all applicable government environmental regulations in the country of origin. None of the packaging used for the shipment of the product uses controlled CFCs in the

*IBM storage products*

manufacturing process. None of the manufacturing processes for disk drive parts or assemblies, including printed circuit boards, use controlled CFC materials.



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[www.ibm.com/harddrive](http://www.ibm.com/harddrive)

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OEM Hard Disk Drive Specifications for DARA-2xxxxx (6GB - 25GB) 2.5 inch hard disk drive with ATA interface, Revision 2.1

This document is not a substitute for the full production specification, which should be used when detailed information is required.

Data is subject to change without notice.

Date: 1st August, 2000