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## Q250 and Q280 Intelligent Disk Drives

### 53 and 80 Megabyte Formatted Capacity Drives with Integrated SCSI Controllers

As members of Quantum's Q200 Series™ of intelligent disk drives featuring integrated SCSI controllers, the Q250 and Q280 combine high capacity and high performance in a compact half-high package. Because all drives in the Q200 Series share the same SCSI implementation and custom integrated controller, the Q200 Series guarantees compatibility among a family of drives from 53 to 160 MB (formatted). The Q200 Series makes it easier than ever before to upgrade systems or offer alternative storage capacities.

### Brilliant Performance

The Q250 and Q280 combine a high performance disk drive with a custom SCSI controller. Quantum designed both drive and controller in parallel to simplify the subsystem design and to optimize data throughput. The resulting subsystem eliminates the device interface logic between drive and controller used in drives whose designs are compromised by accommodating multiple interfaces. The Q200 Series custom controller offers other performance features such as initiating seeks simultaneously with processing commands.

Several other features add to brilliant performance such as the 16 KB dual ported FIFO data buffer which smooths the transfer of data to and from the SCSI bus as well as to and from the drive. The Q250 and Q280 also offer an intelligent defect management scheme which handles media defects without normally requiring additional seeks. In addition, a cylinder skewing scheme minimizes latency when accessing data across cylinder boundaries.

Finally, the Q200 Series employs powerful SCSI commands to relieve the host system of many aspects of disk management. By offloading from the host

system such routine tasks as defect management, error correction, and physical sector addressing, the Q200 Series offers a mass storage subsystem which can improve overall system performance. As a further example, the Copy command allows the Q200 Series drives to transfer data to another peripheral device with minimal host intervention.

### Assured Data Integrity

The Q200 Series is at the head of its class in data integrity features. These drives were designed with data integrity in mind beginning with Quantum's embedded servo approach. Embedded servos (on all sectors of all surfaces) ensure the drive maintains the correct positioning at all times by reducing susceptibility to thermal or mechanical problems. Conservative linear bit and track densities also ensure high data integrity. Q200 Series drives employ a defect management scheme which is both flexible and dynamic, offering user programmable options and handling media defects initially as well as throughout the product's life.

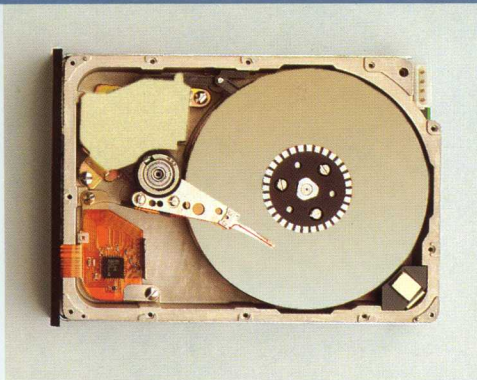
In addition, the error handling capability goes beyond defect management to perform automatic retries and correct data through powerful (96 bit) error correction codes. Finally, to prevent data integrity problems arising from damage to data areas, the Q200 Series features a dedicated landing zone for heads and Quantum's patented AIRLOCK™ actuator lock.

### Proven Reliability

When it comes to reliability, both the Q250 and Q280 are smarter than ever. A simple design, based on fewer mechanical parts and a single printed circuit board, forms the basis for exceptional reliability. The mean time between failure (MTBF) specification is 25,000 hours, including the drive and its embedded controller. The entire subsystem is designed, manufactured, and tested by Quantum to simplify integration into systems and guarantee reliability.

- 53 and 80 MB formatted capacity
- Mean-Time-Between-Failure of 25,000 hours (operating)
- Industry standard ANSI/SCSI host interface
- Supports common command set
- SCSI bus data transfer rate of up to 1.25 Mbytes/second
- Full disconnect/arbitrate/reconnect capability
- SCSI Copy command capability
- Dual port 16KB FIFO data buffer
- Powerful Reed-Solomon ECC with one 17-bit burst error correction and three burst error detection
- Automatic retry for read disk errors
- User selectable transparent defect mapping
- High performance in-line sector defect skipping and reassignment of new defective sectors without need to reformat
- Patented AIRLOCK® shipping lock and dedicated landing zone
- Support for logical block size of 512, 1024, or 2048 bytes
- Multiple block transfer up to 64K blocks

# QUANTUM Q200 SERIES™



## Q250/Q280 SCSI Commands

Copy	Request Sense
Format Unit	Reserve
Inquiry	Rezero Unit
Mode Select	Seek
Mode Sense	Send Diagnostics
Read	Start/Stop Unit
Read Buffer	Test Unit Ready
Read Capacity	Verify
Read Defect Data	Write
Reassign Block	Write Buffer
Release	

## Specifications

Disk Drive Architecture	Q250	Q280
Capacity (formatted)	53 MB	80 MB
Heads	4	6
Disks	2	3
Tracks	3,292	4,938
Format	32 sectors x 512 bytes	
Track Density (TPI)	876	
Flux Density (FCI)	15,000	
Recording Density (BPI)	20,000	
Encoding Scheme	RLL 1,7	

## Performance Specifications

Transfer Rate (Mbits/Sec)	10	
Seek Time (msec)	Typical	Maximum
Average	26	30
Track-to-Track	6	9
Full Stroke	49	55

Seek Times specified are at nominal environmental conditions and include settling.

## Reliability Specifications

MTBF: 25,000 POH  
 PM: not required  
 MTTR: 30 minutes  
 Component design life: 5 years

### Error Rates:\*

Soft Read Errors: 1 per 10<sup>10</sup> bits read  
 Defect Read Errors: 1 per 10<sup>12</sup> bits read  
 Unrecoverable Data Errors: 1 per 10<sup>14</sup> bits read  
 Seek Errors: 1 per 10<sup>6</sup> seeks

\*Exclusive of ECC or retries

## Physical Specifications

### Mechanical Specifications:

Height: 1.68 in./4.19 cm  
 Width: 5.75 in./14.6 cm  
 Depth: 8.05 in./20.44 cm  
 Weight: 3.5 lbs./1.6 kg  
 50 pin dual in-line SCSI connector  
 4 pin industry std power connector

### Environmental Conditions:

	Operating	Non-operating
Temperature	4 to 50°C	-40 to 60°C
Humidity (non-condensing)	8 to 85% RH	5 to 95% RH
Altitude	up to 3 km	up to 10 km

### Power Requirements:

+5 VDC at: 1.45A Typical  
 1.80A Maximum  
 +12 VDC at: 1.4A Typical  
 3.0A Maximum  
 (at power on)

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Specifications subject to change without notice.

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