

230 or 380 MByte 5¼" Full-Height High Performance Disk Drives

9000 SERIES

- Vertically split, clamshell HDA
- Superior thermal, shock, and vibration performance
- ESDI, SCSI, and Custom interfaces
- 16 msec. average access time
- Balanced rotary voice coil actuator
- Designed for automated robotic assembly
- Single surface mount PCBA electronics
- MTBF 30,000 POH

MiniScribe enters the high capacity, high performance market with the first two members of its 9000 Series—the 9230 and 9380—full-height rigid Winchester disk drives with capacities of 230 and 380 MByte. These uniquely designed 5¼-inch full-height drives represent the latest in MiniScribe's integration of state-of-the-art disk technology and automated manufacturing.

The distinguishing feature of MiniScribe's 9000 Series is the vertically split, clamshell HDA. This design allows for a stationary shaft actuator supporting up to 15 mini-composite data heads, an in-hub spindle motor supporting up to 8 sputtered disks, and a dedicated center servo. This design greatly enhances thermal, shock, and vibration performance.

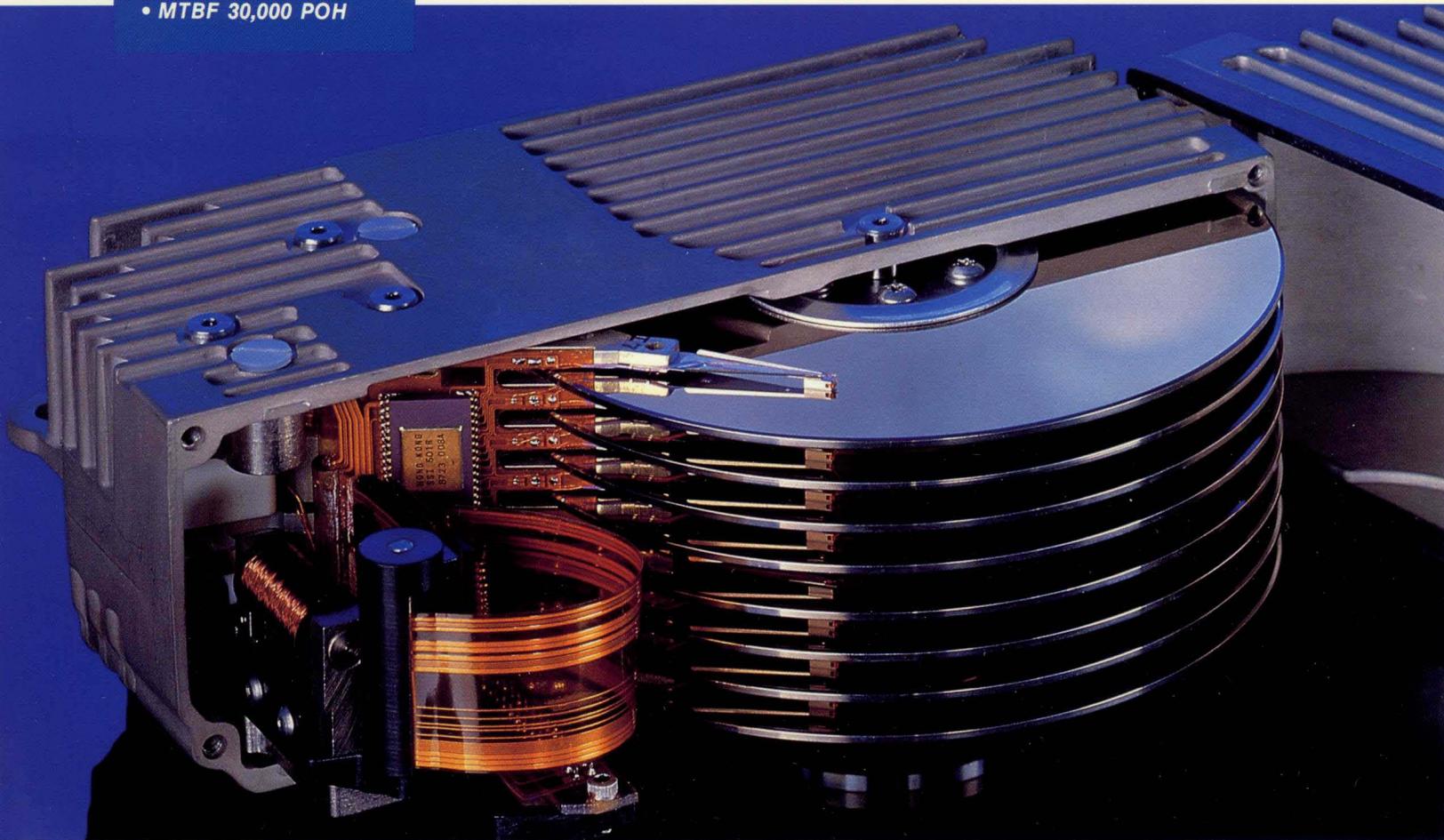
One of the fastest access times in the industry—16 msec—is achieved through a rotary voice coil actuator. The low inertia of the actuator allows for fast access speeds while having low power requirements.

Each drive incorporates a common HDA and utilizes a single surface mounted PCBA. The M9000 is available with an embedded SCSI controller which supports all the required and optional Common Command Sets. The M9000 is also available with an ESDI interface which supports the industry-standard ESDI Command Set.

The 9230 and 9380 are designed for automated robotic assembly for high quality and consistent yields. The drives thus contain fewer parts resulting in greater reliability. Automated assembly also allows for easy expansion of production simply through duplication of assembly lines.

The 9000 Series represents MiniScribe's dedication to providing a full range of high quality data storage solutions on the leading edge of technology.

In addition to the 9000 Series, MiniScribe produces a complete line of 3½-inch and 5¼-inch Winchester disk drives which begins at 12.75 MBytes, extends to high capacity/high performance models, and includes a variety of standard, intelligent and custom interfaces.



5 1/4" Full Height Winchester Disk Drive Specifications

9000 SERIES

	9230	9380
Capacity Unformatted		
Per Drive (MBytes)	230	382
Per Track (Bytes)	20,832	20,832

	9230	9380
Typical Capacity Formatted (ESDI)		
Per Drive (MBytes)	203	338
Sector Size (Bytes)	512	512
Sectors/Track	36	36
Number of Cylinders	1,224	1,224

	9230	9380
Typical Capacity Formatted (SCSI)		
Per Drive (MBytes)	207	347
Sector Size (Bytes)	1,024	1,024
Sectors/Track	19	19
Number of Cylinders	1,224	1,224

Functional		
Disks	5	8
Recording Heads	9	15
Total Cylinders	1,224	1,224
Data Tracks	18,316	18,316
Track Density (tpi)	1,100	1,100
Recording Density (bpi)	20,388	20,388
Data Encoding Method	2,7 RLL	2,7 RLL
Rotational Speed (RPM)	3,600	3,600

Access Time (including settling)		
Average (msec.)*	16	16
Track-to-track (msec.)	3	3
Maximum (msec.)	35	35
Latency (average, msec.)	8.33	8.33

9230 & 9380	
Interface	ESDI/SCSI/CUSTOM

Reliability	
MTBF	30,000 hours
PM	None
MTTR	30 minutes
Component Design Life	5 years

9230 & 9380	
Error Rates	
Soft Read Errors	1 per 10 ¹⁰ bits/read
Hard Read Errors	1 per 10 ¹² bits/read
Seek Errors	1 per 10 ⁶ seeks

DC Power Requirements	
+ 5 VDC ±5%	.6 amps typical
+12 VDC ±5%	1.2 amps typical
	2.7 amps peak
Max. Starting (15 sec.)	4.0 amps

Power Dissipation	
Idle	18 watts typical
Seeking	22 watts typical

Environmental Limits	
Ambient Temperature	50°F to 122°F (10°C to 50°C)
Thermal Gradient	18°F/hour (10°C/hour) max.
Relative Humidity	8% to 80%
Maximum Wet Bulb	78°F (26°C)

Physical	
Height	3.25 in. (82.6 mm)
Width	5.75 in. (146 mm)
Depth	8.0 in. (203 mm)
Weight	6.0 lbs. (2.7 kg)

Features and specifications subject to change without notice.

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* Average of all possible seeks.

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