



M2246E

INSTALLATION

GUIDE

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1. Functional Specifications

Table 1.1 Functional Specifications

Specification	Model		
	M2244E	M2245E	M2246E
Total storage capacity			
Unformatted (MB)	85.8	120.2	171.7
Formatted ^{*1}	67.4	94.4	134.8
Storage capacity/track			
Unformatted (bytes)	20,864		
Formatted ^{*1} (bytes)	18,384		
Number of disks	3	5	6
Number of heads (R/W)	5	7	10
Number of cylinders	823	823	823
Number of tracks/cylinder	5	7	10
Number of sectors	Selectable		
Recording density (bpi)	20,400		
Track density (tpi)	850		
Transfer rate (Kbytes/s)	1,250		
Rotational speed (rpm)	3,600		
Average latency time (ms)	8.3		
Recording method	RLL (2/7)		
Position time min. (ms) ^{*3}	5		
avg. (ms)	25		
max. (ms)	50		
Input voltage ^{*2}	+12V \pm 5%, 1.8 A (max 4.8 A) +5V \pm 5%, 1.6 A		
Ripple ^{*4}	+5V / +12V, 50 mV p-p		
Outer dimensions			
Width x height x depth (mm)	146 x 83 x 203 (146 x 83 x 208 with front protector installed) (150 x 86 x 208 with front panel installed)		
Disk size (mm)	Outer diameter 130 Inner diameter 40		
Weight (kg)	3.0		

^{*1} 256 bytes/sector for 64 sectors

^{*2} Meets voltage tolerance for unit power supply connectors

^{*3} Including settling time

^{*4} High frequency noise 100 mV p-p max.

2. Start and Stop Time

Start time (time from when power is turned on until unit is ready) is 20 seconds or less. Stop time (time to completely stop when power is turned off) is 15 seconds or less using dynamic braking to prevent disc and head wear.

3. Physical Specification

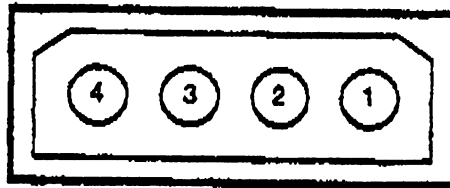
Table 3.1 Physical Specifications

Operating Temperature Gradient Relative Humidity Altitude above sea level Vibration Shock	5°C to 45°C 15°C/h or less 20% RH to 80% RH Moisture must not condense 0m to 3,000m Less than 0.2G (3 Hz to 100 Hz) 2 min x 30 cycles (except resonance point) (sinusoidal waveform) Less than 2G (max. 10 ms)
Non-operating Temperature Relative Humidity Altitude above sea level Vibration (power-off state after installation) Shock	-40°C to 60°C 5% RH to 95% RH Moisture must not condense 0m to 12,000m Less than 0.4G (3 Hz to 100 Hz) 2 min x 30 cycles (sinusoidal waveform) Less than 20G (max. 10 ms)

Note: The temperature specification is for the outside air surrounding the drive.

4. Power Requirements

(1) Power connectors pin assignment



View from cable side of connector

1	+ 12 V
2	+ 12 V RTN
3	+ 5 V RTN
4	+ 5 V

Figure 4.1 Power connector pins

(2) Input voltage tolerance and current

	Input voltage	Peak current	Average current
+12V	+ 12 V \pm 5%	4.8 A	1.8 A
+ 5V	+ 5 V \pm 5%	-	1.6 A

(3) Power consumption

Steady state 30 W (typical).

5. Media Defects

- a. Cylinder 0, Head 0 and 1 are defect free.
- b. The number of defects in the drive are as follows:
 - M2244E - 85 or less
 - M2245E - 120 or less
 - M2246E - 171 or less
- c. The maximum defect length is 32 bytes.
- d. All defects are recorded on a label and on the media per the ESD specification.

6. Media Defect List

Before the unit leaves the factory, media defects are listed on the MEDIA DEFECT LIST and this list is attached to the drive. The following figure shows an example of a MEDIA DEFECT LIST.

== = MEDIA DEFECT LIST == =

DATE: 87/03/14

DE NO: 002017

MODEL: M2248E SERIAL NO: J2101

No.	CYLINDER	HEAD	POS/BYTES	LEN/BITS
001	00EB(0235)	00(00)	009F(00159)	008(0008)
002	0115(0277)	03(03)	0120(002288)	00B(0011)
003				
004				

Length of defect (unit:
bit); hexadecimal number
(decimal number)

Position from index to lead bit of
defect (unit: byte); hexadecimal
number (decimal number)

Head address; hexadecimal number
(decimal number)

Cylinder address; hexadecimal number (decimal
number)

Note: It is recommended wherever possible that the manufacturers media defect list be included in any defect management used. Consult disc controller or system manufacturers guide.

7. Connections

The drives are connected to the controller as shown in Figure 7.1. Up to 7 drives can be connected in serial mode. To connect the drives, the A cable (control signals) must be connected in series and the B cables (R/W signals) must be connected radially. Termination of the control signals must be performed only at the last drive. Therefore the termination resistor pack must be removed from all but the last drive. See Figure 9.1 for location of termination resistor pack.

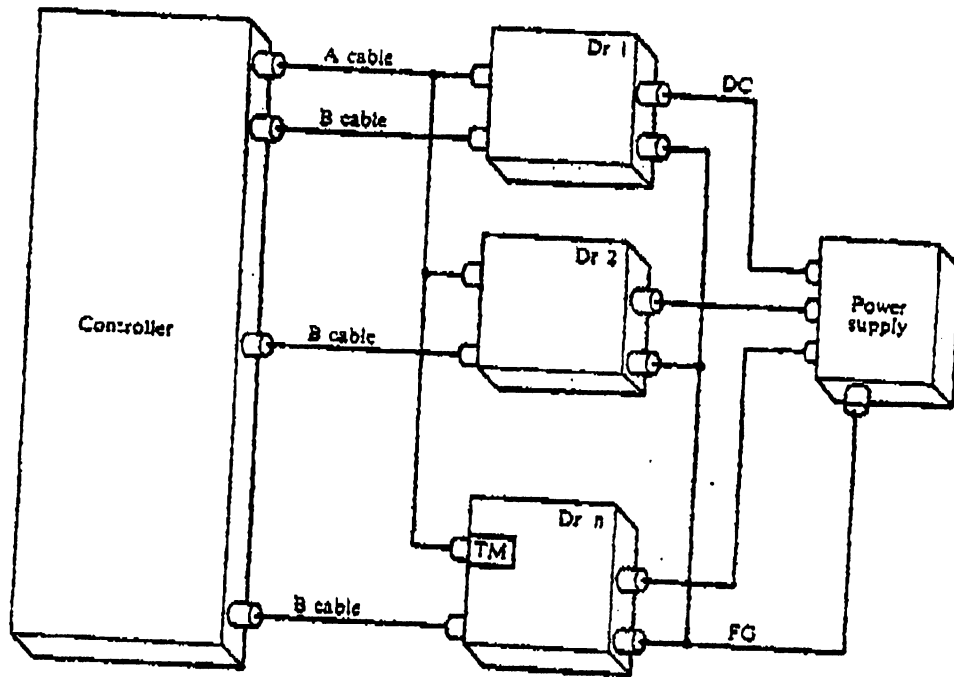


Figure 7.1 Multi-drive connection

8. Installation

8.1 Outer dimensions

Figure 8.1 shows the outer and mounting dimensions. All dimensions are in millimeters.

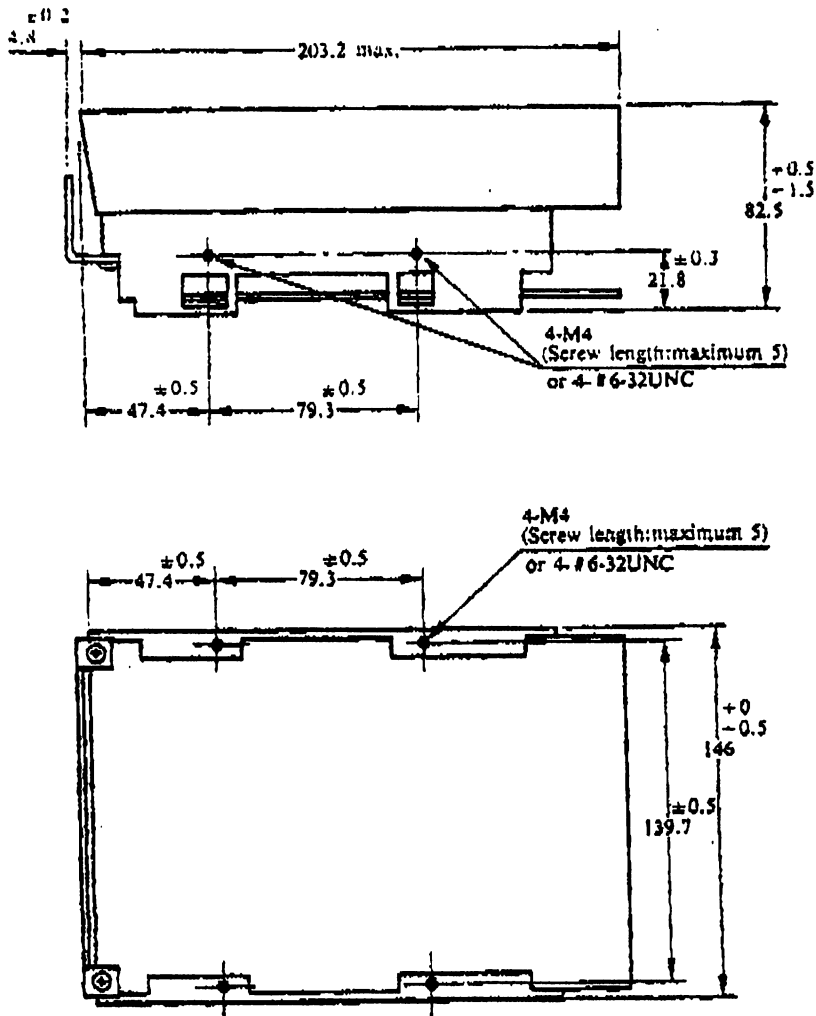


Figure 8.1 Outer dimensions

Note: UK drives are normally supplied to suit metric (M4) mounting screws.

8.2 Notes on Installation

(1) Installation direction

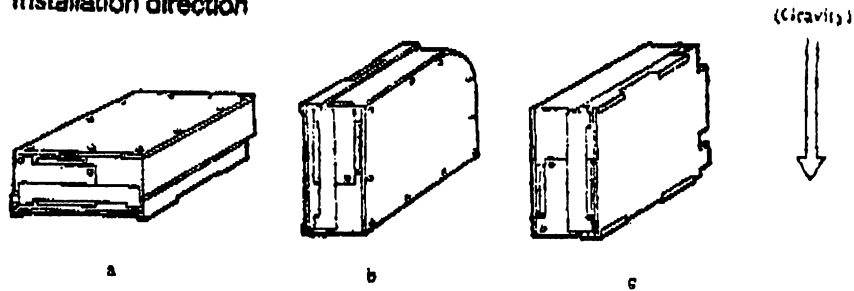


Figure 8.2.1 Mounting direction

There are three possible installation directions, and the mounting angle must be less than $\pm 5^\circ$ from the horizontal.

(2) Frame structure

The casting/HDA (signal ground) is electrically isolated from the mounting brackets (frame ground). If this isolation is to be maintained within the system, precautions must be taken. An embossed structure (or any other structure that does not touch the aluminium base) as shown below, should be used to prevent the aluminium base from touching frame ground (FG). The mounting screws should project no more than 4mm from the outer wall of the drive mounting bracket.

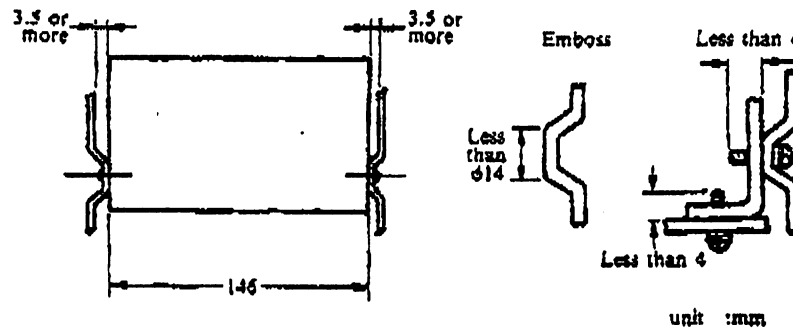


Figure 8.2.2 Mounting Frame

(3) Ambient temperature

The operating temperature range of this drive is specified at a distance of 3cm from the unit. Note, temperature specifications are for the outside air surrounding the drive. It may be necessary in some conditions to force air cool the drive.

9. Short Circuit Setting Procedure

Details are given only for the M2244/5/6E#1 models as shipped. Short circuit setting procedures are different on some older models and in particular for the M2244/5/6E model revision A7 and below.

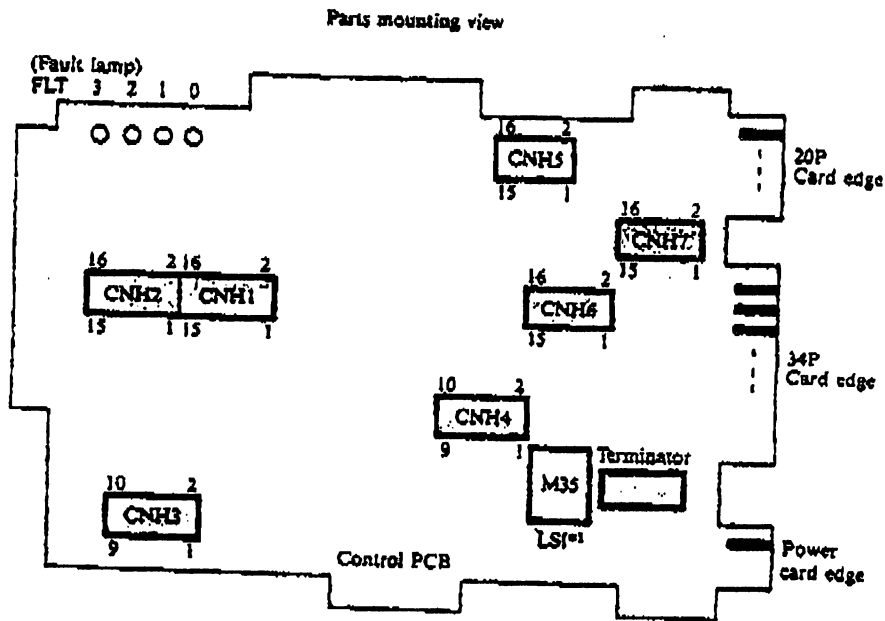


Figure 9.1 Short plug locations

Short plugs are inserted as follows when shipped from the factory.

- CNH7: Between 1 and 2, 7 and 8, 9 and 10, 11 and 12, and 15 and 16
- CNH6: Between 1 and 2, and 15 and 16
- CNH4: Between 5 and 6
- CNH2: Between 15 and 16
- CNH5: Between 11 and 12, and 15 and 16

The following settings are model specific.

- CNH7: Between 3 and 4: M2246E
- Between 5 and 6: M2245E
- Not short between 3 and 4, or 5 and 6: M2244E

10. Settings

(1) Drive select (drive number setting)

Drive number	CNH6						
	1-2	3-4	5-6	7-8	9-10	11-12	13-14
1	Short	Open	Open	Open	Open	Open	Open
2	Open	Short	Open	Open	Open	Open	Open
3	Open	Open	Short	Open	Open	Open	Open
4	Open	Open	Open	Short	Open	Open	Open
5	Open	Open	Open	Open	Short	Open	Open
6	Open	Open	Open	Open	Open	Short	Open
7	Open	Open	Open	Open	Open	Open	Short

(2) Radial option

When pins 15 - 16 are shorted, the drive output signals are always enabled regardless of the Drive Select signal. Without a jumper, the output signals are enabled only when the drive is selected.

Output signals gated or not gated (select signal)	CNH6
	15 - 16
No gate (radial)	Short
Gate (daisy)	Open

(normally this setting is required)

(3) Other settings

The setting value is valid only when the power is on.

a.

Location		Function
CNH7 1 - 2	Short	Function for motor start control from interface: No Yes
	Open	

b.

CHN7		Device type selection
3 - 4	5 - 6	
Open	Open	M2244E
Open	Short	M2245E
Short	Open	M2246E

c.

CHN7		Sector mode setting
13-14	15-16	
Open	Open	Drive hard sector (Sector)
Open	Short	Controller hard sector (Byte Clock)
Short	Open	Controller soft sector (Address Mark Found)

d.

CHN7			Sector Setting	
7 - 8	9 - 10	11-12	Sectors/Track	Bytes/Sector
Open	Open	Open	16	1304
Open	Open	Short	18	1159
Open	Short	Open	19	1098
Open	Short	Short	32	652
Short	Open	Open	34	613
Short	Open	Short	35	596
Short	Short	Open	64	326
Short	Short	Short	65	320

7 - 8, 9 - 10, 11 - 12 are valid only in drive hard sector mode. It is possible for the host controller to override the jumper sector settings in hard sector mode. Please refer to host controller manual.

e.

CNH5		Installation direction
11 - 12	13 - 14	
Short	Open	Direction type B
Open	Short	Direction type A or C

Note: Direction type as show in Figure 10.1.

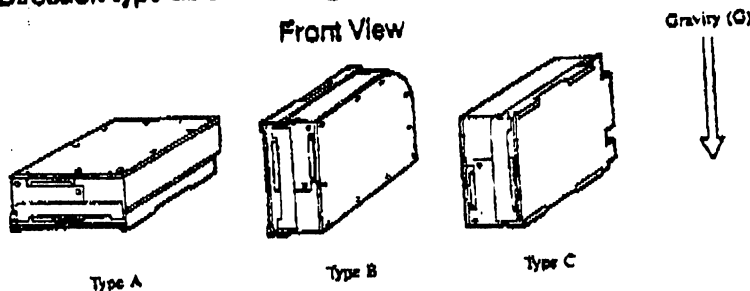


Figure 10.1 Direction type

f.

CNH5	Ready LED control
15 - 16	
Open	Always enabled .
Short	Enabled when the drive is selected

11. Indicator LEDs

READY and FAULT LEDs are mounted in this drive. Their functions are explained below.

- (1) **READY LED (green)**
The READY LED lights when the drive becomes ready to accept commands or when the drive becomes ready to accept commands and is selected (according to the setting of CNH5, 15-16). This LED goes off during an initial seek operation and execution of a command.
- (2) **FAULT LEDs (red)**
FAULT LEDs are mounted on the controller PCA (see Figure 9.1). The binary four-bit fault code indicates that a fault has occurred. See Table 11.1 for details of the code.

Table 11.1 Fault code list

Code	Fault LED				Conditions
	3	2	1	0	
1.	X	X	X	○	Spindle motor speed less than 90% of standard.
2.	X	X	○	X	VCM overcurrent.
3.	X	X	○	○	Initial seek timeout.
4.	X	○	X	X	Write command input during seek operation.
5.	X	○	X	○	+12V/+5V, less than 80% of standard.
6.	X	○	○	X	Offtrack during write operation.
7.	X	○	○	○	Write Echo Check.
8.	○	X	X	X	Multiple head ICs selected during write operation.
9.	○	X	X	○	Seek operation timeout.
A.	○	X	○	X	Guard band detected during normal seek operation.
B.	○	X	○	○	Guard band detected during linear mode.
C.	○	○	X	X	Overshoot check.
D.	○	○	X	○	Seek command during occurrence of a seek fault.
E.	○	○	○	X	Head load signal drop after system comes ready.
F.	○	○	○	○	Both Read and Write commands input simultaneously.
*1.	X	X	X	○	Invalid or illegal command.
*2.	X	X	○	X	Interface failure.
*3.	X	X	○	○	Command data parity error.

○ = On

X = Off

- Notes:
1. The fault LEDs for fault code *1, *2, or *3 flash.
 2. The fault is reset by using the Attention Reset command.
 3. Fault 2 cannot be cancelled without turning OFF the power.

This booklet is intended only as a guide for installation. Specifications are subject to change without notice. More information can be found in the M2246E OEM Manual part no. B03P-4805-0102A and Customer Engineering Manual part no. B03P-4805-0130A. For these additional manuals, contact your Fujitsu disc supplier.

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