

**StorCase<sup>®</sup> Technology**  
**Data Express<sup>®</sup>**  
**Ultra320 DE100**

*Removable SCSI Ultra320  
Drive Enclosure with  
80-Pin SCA Interface*

**User's Guide**

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**Data Express®**  
**Ultra320 DE100**

*Removable SCSI Ultra320  
Drive Enclosure with  
80-Pin SCA Interface*

**User's Guide**

**Part No. D89-0000-0240 A00**

**September 2003**



StorCase Technology, Inc.  
17600 Newhope Street  
Fountain Valley, CA 92708-9885  
Phone (714) 438-1850      Fax (714) 438-1847

## LIMITED WARRANTY

STORCASE TECHNOLOGY, Incorporated (“StorCase”) warrants that its products will be free from defects in material and workmanship, subject to the conditions and limitations set forth below. StorCase will, at its option, either repair or replace any part of its product that proves defective by reason of improper workmanship or materials. Repair parts or replacement products will be provided by StorCase on an exchange basis, and will be either new or reconditioned to be functionally equivalent to new.

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**Seven-Year Warranty:** The following StorCase products are covered by this warranty for a period of seven (7) years from the original date of purchase from StorCase or its authorized reseller: all Data Express® removable device enclosures and all StorCase interface cables and accessories specifically intended for use with these products. Data Silo®, Data Stacker® and InfoStation® products are covered by this warranty for a period of seven (7) years, excepting the RAID controller, power supply, fan and blower components, which are covered by the three-year warranty described below.

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StorCase Technical Support can be reached in the U.S. at (714) 438-1858 or toll-free at (888) 435-5460 (U.S. and Canada only). StorCase European Technical Support can be reached in the U.K. at +44 (0) 1932 738900.

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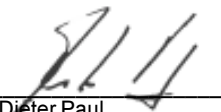
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## Declaration of Conformity

<b>Company Name:</b>	StorCase Technology, Inc.
<b>Corporate Office Address:</b>	17600 Newhope Street Fountain Valley, CA 92708
<b>Manufacturing Address:</b>	17600 Newhope Street Fountain Valley, CA 92708
<b>Product Name:</b>	Data Express Ultra320 DE100 80-pin SCA
<b>Model Number:</b>	S20A160, S20A161, S20A162, S20A163, S20A164, S20A165
Conforms to the following standards:	
<b>EMC Directives:</b> (89/336/EEC)	EN 50081-1: 1992 - EN 55022: 1998 - EN 61000-3-2 Harmonic Current - EN 61000-3-3 Voltage Fluctuations and Flicker EN 55024: 1998 - EN 61000-4-2 - EN 61000-4-6 - EN 61000-4-3 - EN 61000-4-8 - EN 61000-4-4 - EN 61000-4-11 - EN 61000-4-5
<b>Safety Standards:</b> CSA (NRTL/C)	CAN/CSA-C22.2 No. 950-95 UL 1950
<b>TUV</b>	EN 60950: 2000
<b>EMI Standards:</b>	FCC Part 15, Class B
<b>EMC Standards:</b>	AS/NZS 3548 Information Technology Equipment Supplier's Code Number N10664
<b>Year of Manufacture:</b>	2003
<b>Signature:</b>	
<b>Full name:</b>	Dieter Paul
<b>Position:</b>	President

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Please check the StorCase web site at <http://www.storcase.com> or contact your StorCase representative for the latest revision of this document.

# INTRODUCTION

## Packaging Information

The StorCase Technology Data Express® system is shipped in a container designed to provide protection and prevent damage during shipment. The Data Express unit was carefully inspected before and during the packing procedure at the factory. Bent or broken connectors, or evidence of other damage to the Data Express should be reported to the shipper immediately. Refer to Figure 1 for the package contents.

If the wrong Data Express model has been received, please call your reseller or StorCase at (800) 435-0642 to arrange for a Return Material Authorization (RMA). StorCase cannot accept returns which do not display an RMA number on the outside of the package. Return the unit with all the original packing materials.

Before removing any component from its packaging, discharge any static electricity by touching a properly grounded metal object.

## Serial Numbers

Both the Data Express DE100 receiving frame and carrier are labeled with serial numbers. These numbers must be reported to the StorCase Customer Service Representative in order to receive a Return Material Authorization (RMA) for warranty claims. Locate the serial number labels and record the numbers in the spaces provided below.

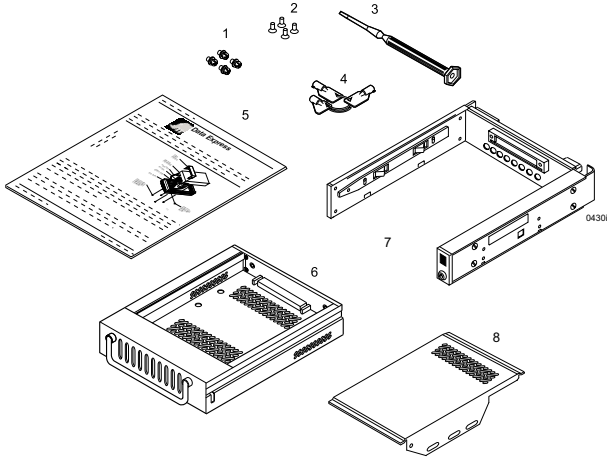
**Receiving Frame:**

**Device Carrier:**



## Package Contents

The DE100 package contents include the following items. If any item is missing or damaged, contact your StorCase dealer for a replacement.



- |  |                    |
|--|--------------------|
| 1. #6-32 x 1/4 Phillips<br>Pan Head Mounting Screws  | 5. Insert Sheet    |
| 2. #6-32 x 1/4 Phillips<br>Flat Head Mounting Screws | 6. Drive Carrier   |
| 3. Alignment Tool                                    | 7. Receiving Frame |
| 4. Drive Lock Keys                                   | 8. Drive Cover     |

*Figure 1: Package Contents*

## General Description

**NOTES:** For SCSI Ultra320 operation, the Ultra320 DE100 requires Ultra320 drives, Ultra320 HBA, and Ultra320-compliant cabling (internal and external).

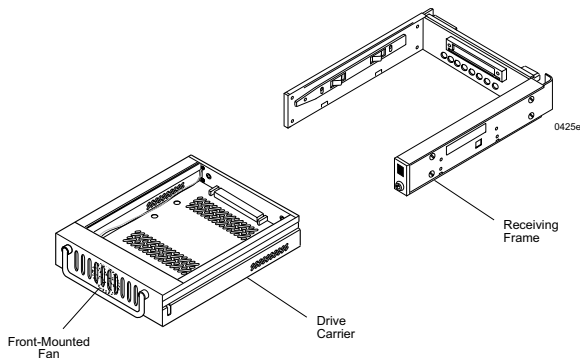
Ultra320 DE100 can support Ultra320 implementations with a maximum of fifteen (15) Ultra320 drives (Ultra320 repeater may be required).

Ultra320 DE100 receiving frames are indicated by their BLUE LED, while the Ultra320 DE100 carriers are indicated by the Ultra320 logo.

The StorCase Technology **Data Express® Ultra320 DE100** is composed of a receiving frame which supports SCSI Ultra320 interfaces and fits within a 5.25" half-height peripheral slot. This 16-bit single-connect I/O can support up to 320MByte/sec transfer rates. The receiving frame contains one (1) removable drive carrier designed to provide durable and reliable mounting for one (1) 3.5" form factor Single Connector Attachment (SCA) SCSI drive (Figure 2).

A field-replaceable fan in the front of the drive carrier provides enhanced heat dissipation (3.5 CFM). Refer to Appendix C for further information.

The Ultra320 DE100 allows a drive to be removed and transported to another Ultra320 DE100-equipped computer or expansion chassis, and also provides the ability to secure sensitive data by removing and storing the drive safely for future use. Up to fifteen (15) Ultra320 DE100 units can be attached to one host adapter.



*Figure 2: Ultra320 DE100 Receiving Frame and Carrier*

This User's Guide describes the steps required to install the StorCase Data Express DE100 removable enclosure inside of a computer peripheral bay or external chassis. This guide supplements documentation provided with the host computer system, operating system, and the drive to be installed within the carrier.

## Receiving Frame Front Panel

(Figure 3)

- **Key Lock/Drive Power Switch** - This key switch assures proper seating of the drive carrier within the receiving frame, turns power to the drive carrier ON and OFF, and prevents unauthorized removal or installation of the carrier. For the computer to access data on the disk drive, the key must be turned counterclockwise to the locked position.

The key can be permanently attached to the locking mechanism as shown in Appendix C.

- **Unit ID Number Indicator** - (Figure 4) This BLUE LED displays the physical address of the Ultra320 DE100 drive carrier if the carrier is *Installed and Locked* in the receiving frame or if the carrier is *Removed* from the receiving frame. If the carrier is *Installed but Not Locked* in the receiving frame, a "u" will be displayed to indicate an unlocked condition. The unit ID number is selected by means of the unit ID select switch inside the receiving frame using a special alignment tool supplied with the DE100.

**Fan Failure LED** - The unit ID number indicator will display a flashing "F" and an audible alarm will sound to indicate a fan failure.

- **Activity Indicator**- A small BLUE dot next to the Unit ID Number which illuminates to show when the host computer is accessing the data on the DE100 carrier. This dot will flash during communication with the host computer.

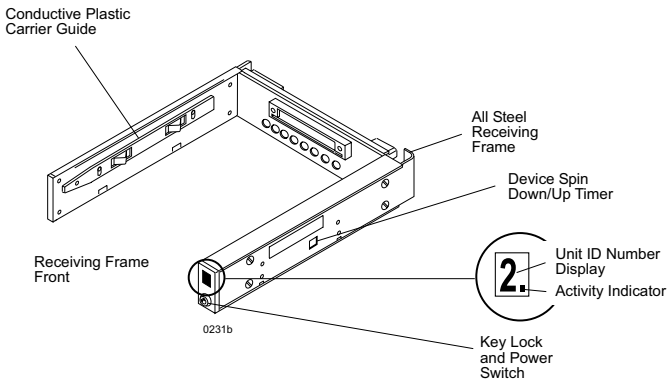
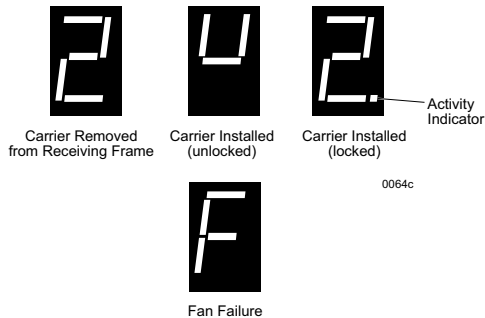


Figure 3: Receiving Frame (Front View)



The number "2" shown above is for illustration purposes only. It can be any valid unit ID number. The letter "u" and "F" will appear as illustrated.

*Figure 4: Receiving Frame Unit ID Number and Activity Display*

## Receiving Frame Rear Panel

(Figure 5)

- **DC Power Connector (P1):** The Ultra320 DE100 uses a standard 4-pin DC power connector to accept DC power.
- **I/O Connector (J3) :** The input/output connector provides a standard interface for 16-bit wide SCSI signals.
- **Buzzer:** Buzzer will sound in the case of a fan failure.
- **Option Pin Connector (W1):**

**Remote Unit ID Selection:** Pins 1-8 of this connector are provided for remote unit SCSI ID selection through the computer system. Remote ID selection requires that the unit ID switch located on the inside of the receiving frame be set to "0" (onboard ID selection is set with a switch located on the inside of the receiving frame as shown in Figure 10). See Table 1 for pin assignments.

**Remote Activity LED (RLED):** Pins 17 & 18 provide power for a remote LED device activity indicator.

**Factory-Installed Jumpers:** There are two (2) jumpers factory-installed on W1. These jumpers are located on Pins 9 & 10, and Pins 19 & 20.

**NOTE:** Do not remove these jumpers!

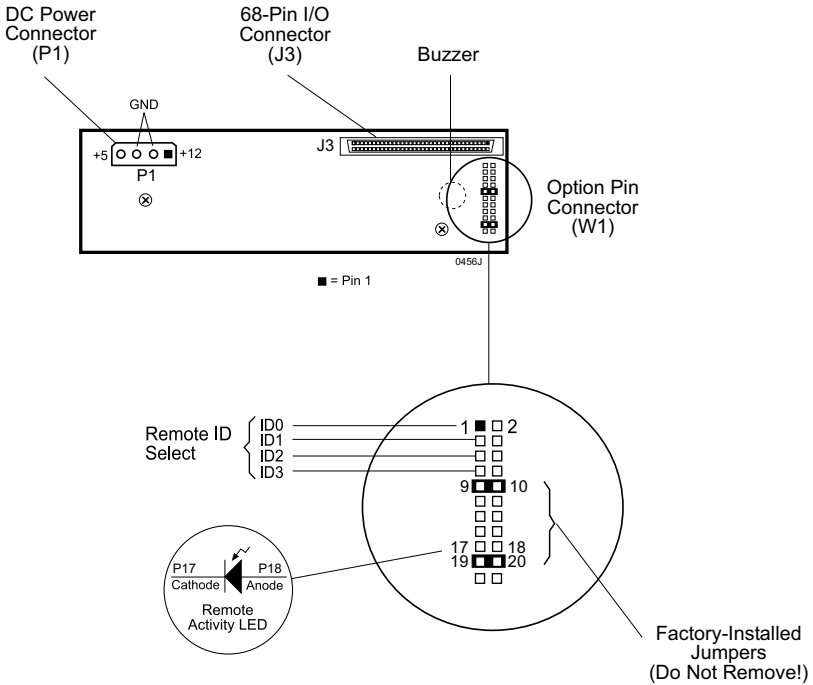


Figure 5: Receiving Frame Motherboard (Rear View)

## INSTALLATION

**NOTES:** For SCSI Ultra320 operation, the Ultra320 DE100 requires Ultra320 drives, Ultra320 HBA, and Ultra320-compliant cabling (internal and external).

Ultra320 DE100 can support Ultra320 implementations with a maximum of fifteen (15) Ultra320 drives (Ultra320 repeater may be required).

Ultra320 DE100 receiving frames are indicated by their BLUE LED, while the Ultra320 DE100 carriers are indicated by the Ultra320 logo.

### Installing the Drive in the Carrier

#### Preparation

While performing the steps in this section, work on a soft surface to prevent excessive shock to the drive being installed. Also refer to the manufacturer's documentation provided with the drive.

**NOTE:** A #2 Phillips screwdriver will be required during this procedure.

1. Remove the drive from its protective packaging.
2. **Plastic Drive Bezel:** If the drive came equipped with a plastic front bezel, it must be removed.
3. **SCSI Drive Termination:** The Ultra320 DE100 does not provide onboard termination. External termination must be provided. Refer to the documentation provided by the drive manufacturer for termination information.

#### Installation

1. Carefully insert the drive into the carrier. Slide the drive towards the Drive Carrier Board, so that the I/O connector on the drive mates with the I/O connector on the board (Figure 6).
2. Fasten the drive into place with four (4) #6-32 Phillips Flat Hd. screws (Figure 6).
3. Once the drive is installed into the carrier, install the drive cover onto the carrier. Fasten the cover into place with two (2) #6-32 Phillips Flat Hd. screws (Figure 7).

**NOTE:** Installation of drive cover is necessary for proper fan air flow!

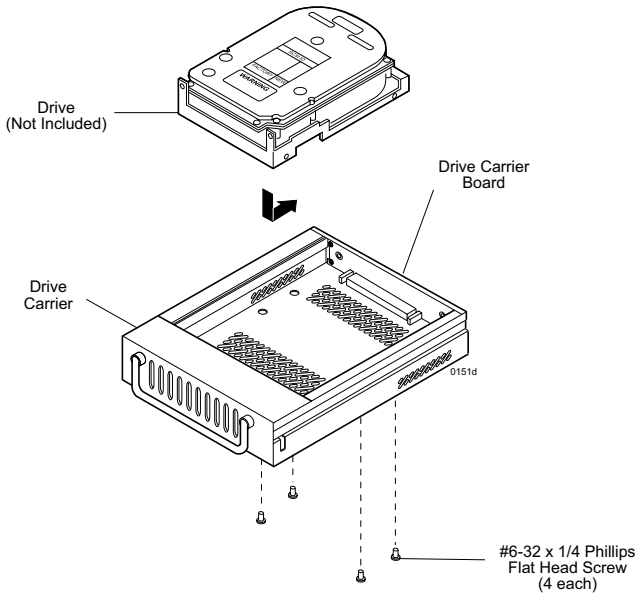


Figure 6: Drive Installation Assembly

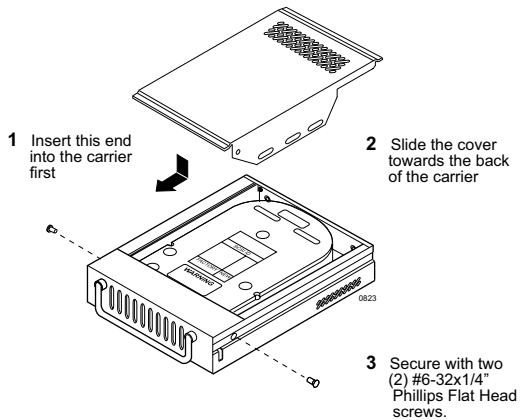
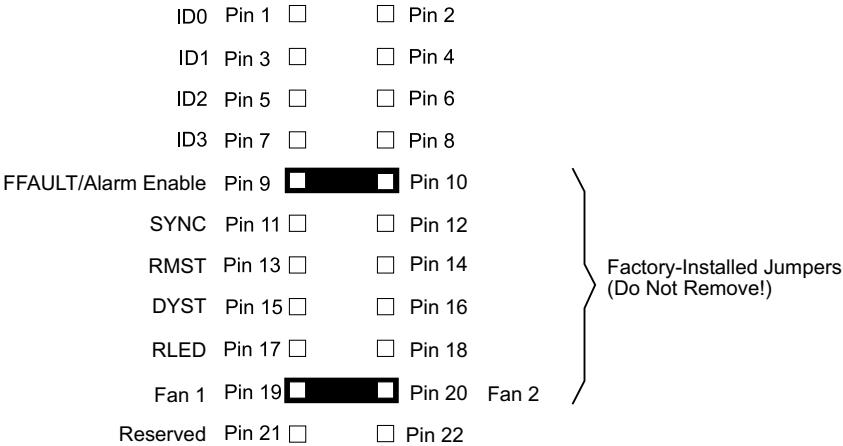


Figure 7: Drive Cover Installation

### Installing the Receiving Frame

The drive should be installed into the carrier before installing the receiving frame into the mounting bay of a computer or expansion chassis. A #2 Phillips screwdriver will be required for installation.

1. Turn OFF power to the computer.
2. Open the computer system according to the manufacturer's instructions. If necessary, temporarily remove any expansion boards that may make installation difficult.
3. To select the Ultra320 DE100 unit ID remotely through the computer system or external expansion chassis, the appropriate cable from the system must be connected to the ID Select Pins 1-8 on the rear of the receiving frame as shown in Figure 8.



0439i

Figure 8: Receiving Frame Motherboard Option Pin Connector (W1)



**Table 1: Option Pin Connector (W1) Signal Descriptions**

PIN	Signal	Function
1	ID0	SCSI ID
2	GND	Ground
3	ID1	SCSI ID
4	GND	Ground
5	ID2	SCSI ID
6	GND	Ground
7	ID3	SCSI ID
8	GND	Ground
9	FFAULT	Fan Fault LED/Alarm Enable*
10	FFAULT	Fan Fault LED/Alarm Enable*
11	SYNC	Drive Synchronous Signal
12	GND	Ground
13	RMST	Remote Start (see Table 2)
14	GND	Ground
15	DYST	Delay Start (see Table 2)
16	GND	Ground
17	RLED	Remote LED Cathode
18	RLED	Remote LED Anode
19	FAN1	Fan Signal**
20	FAN2	Fan Signal**
21	Reserved	Reserved
22	Reserved	Reserved

\* Jumper on Pins 9 & 10 required for Fan Fault LED/Alarm option.

\*\* Jumper on Pins 19 & 20 required for Fan option.

**Table 2: Option Pins 13-16 Drive Motor Control**

DYST	RMST	Function
Open	Open	Motor spins up on "Power On"
Open	Closed	Motor spins up only if SCSI "Start" command is received
Closed	Open	Drive motor starts spinning up approximately 12 seconds x the SCSI ID number for each target drive (12 second minimum)
Closed	Closed	Reserved

Closed = Jumper installed

Open = Jumper removed

**NOTE:** Option Pins 13-16 (Table 2) are used to remotely access the disk drive's motor control options. Refer to the drive manufacturer's documentation for further information.

4. With the drive carrier locked into place inside the receiving frame, install the Ultra320 DE100 receiving frame into the drive bay in the computer or expansion chassis. Use the appropriate guides to position the Ultra320 DE100, and fasten it into place with the four (4) #6-32 Phillips screws provided. Figure 9 illustrates the location of the mounting holes. Mounting holes are provided on each side and the bottom of the receiving frame to accommodate a variety of mounting configurations. Use the mounting holes which best suit the computer or expansion chassis configuration.

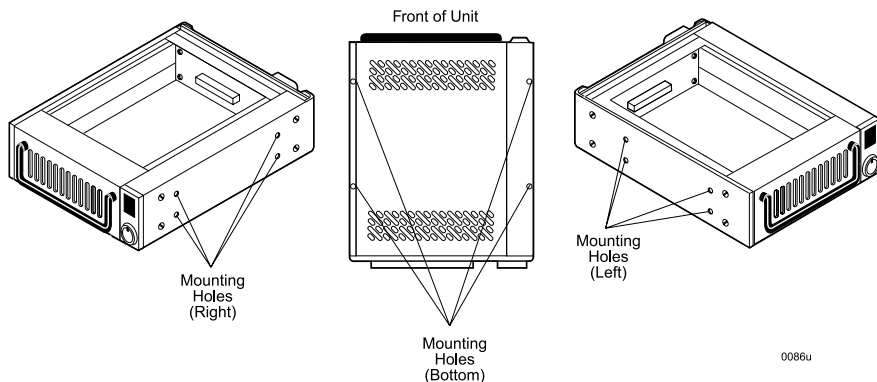


Figure 9: Receiving Frame Mounting Holes

5. Adjust the front of the receiving frame so the carrier slides freely in and out on the receiving frame guides. The position of adjoining peripheral units may require adjustment.
6. Connect the I/O cable from the host adapter to the receiving frame. The Pin 1 indicator on the cable must be properly aligned. Refer to Figure 5 for the correct Pin 1 location on connector J3.

**NOTE:** Make sure that only the last SCSI device is terminated. No onboard termination is provided on the Ultra320 DE100. External termination must be provided.

7. Connect the power cable from the DC power supply in the computer or expansion chassis to the power connector on the Ultra320 DE100 receiving frame. Refer to Figure 5 for the receiving frame power connector location.
8. Replace any expansion boards that may have been removed earlier. Replace the system cover according to the manufacturer's instructions.
9. Reconnect any system or peripheral cables removed earlier.
10. Turn ON power to the computer. If the installation has been successful, and all cables have been properly attached, the system should boot normally. Although the computer may not recognize the Ultra320 DE100 yet, the front panel LED indicator on the receiving frame should illuminate.

**NOTE:** The lock on the Ultra320 DE100 receiving frame functions as a lock and a DC power switch for the carrier unit. The lock must be engaged (turned counterclockwise) in order to supply power to the carrier and installed drive unit.

11. The new drive may need to be formatted or initialized prior to use with the operating system and applications software. Refer to the drive and/or computer manufacturer's documentation for formatting information.

## Selecting the Unit ID Number

1. Verify that power is turned ON to the Ultra320 DE100 receiving frame by turning on the computer or external expansion chassis. A number should appear in the unit ID display window if the carrier is locked into place.
2. Unlock the Ultra320 DE100 drive carrier and remove it from the receiving frame. A "u" will be displayed initially when the unit is unlocked but will return to a SCSI ID number when the carrier is removed from the receiving frame.

**WARNING:** Unlocking the carrier unit switches DC power OFF to the drive. Since disk drives require a short amount of time to spin down, allow about 15 seconds before pulling the carrier unit out of the receiving frame to avoid possible damage to the drive.

3. Use the alignment tool supplied with the Ultra320 DE100 to select the unit ID number of the disk drive. Refer to Figure 10 for the location of the unit ID select switch inside the receiving frame.
4. After selecting an appropriate unit ID number, replace the Ultra320 DE100 carrier in the receiving frame, and **LOCK IT INTO PLACE**.

- 5. The new drive may need to be formatted or initialized prior to use with the operating system and applications software. Refer to the drive and computer manufacturer's documentation for formatting information.

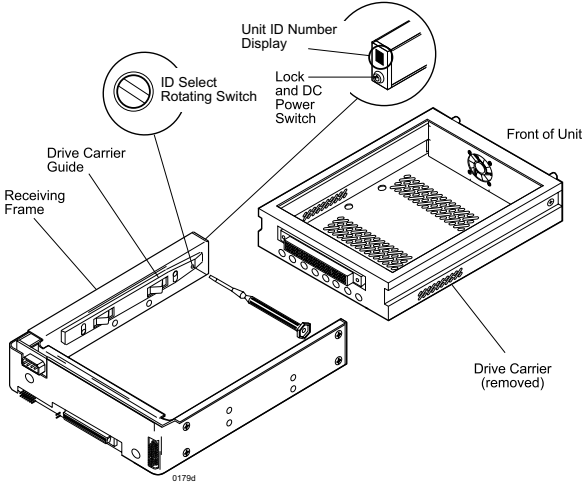


Figure 10: Unit ID Select Switch Location

## Adjusting the Spin Down/Up Timer

**NOTE:** The timer for device spin down is controlled by a small selector, located in a cutout on the side of the Ultra320 DE100 receiving frame as shown in Figure 11. The amount of time required for a drive to spin down is approximately 15 seconds or more. This number can vary depending on the type of SCSI device and manufacturer (some drives may require 45 seconds or more). The factory configuration is set for 20 seconds. A different delay time may be selected with the provided alignment tool. Refer to the SCSI device manufacturer's manual for more information on required device spin down time.

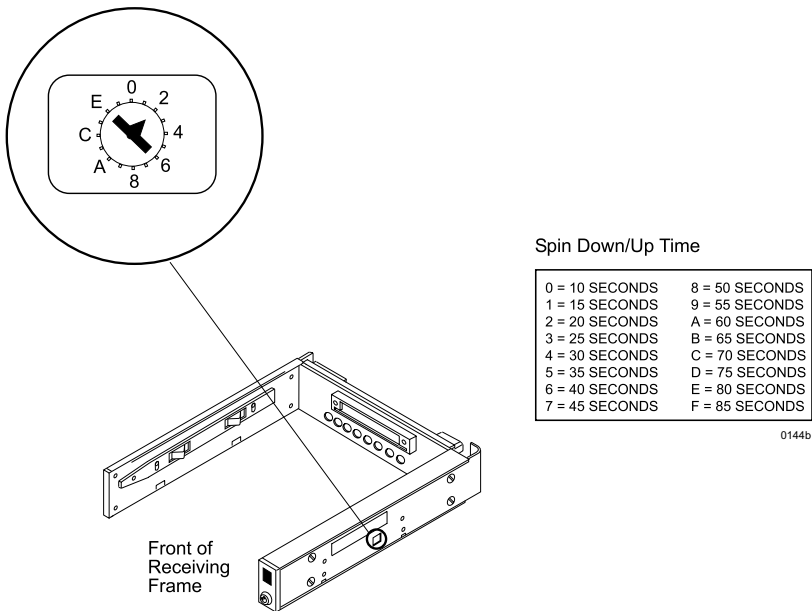


Figure 11: Device Spin Down/Up Timer Switch

## **APPENDICES**

## Appendix A - Specifications/Dimensions

SCSI Data Express subsystems conform to the Small Computer Systems Interface (SCSI) Standard set by the American National Standards Institute (ANSI).

Environmental Specifications		
	Operating	Storage
Ambient Temperature	0° C to 50° C	-45° C to 75° C
Relative Humidity <sup>(1)</sup>	10% to 80%	10% to 90%
Altitude	-1000 to 50,000 ft -304m to 15240m	-1000 to 50,000 ft -304m to 15240m
Shock <sup>(2)</sup>	10g	60g

<sup>(1)</sup>Non-condensing with maximum gradient of 10% per hour.

<sup>(2)</sup>11 msec pulse width 1/2 sine wave.

Physical Specifications	Carrier	Receiving Frame
Height	1.68" (42.7mm)	1.70" (43.2mm)
Width	4.67" (118.6mm)	5.75" (146.1mm)
Depth	7.38" (187.5mm)	7.93" (201.4mm)
Weight	1.1lb (0.50kg)	1.3lb (0.59kg) <sup>(1)</sup>

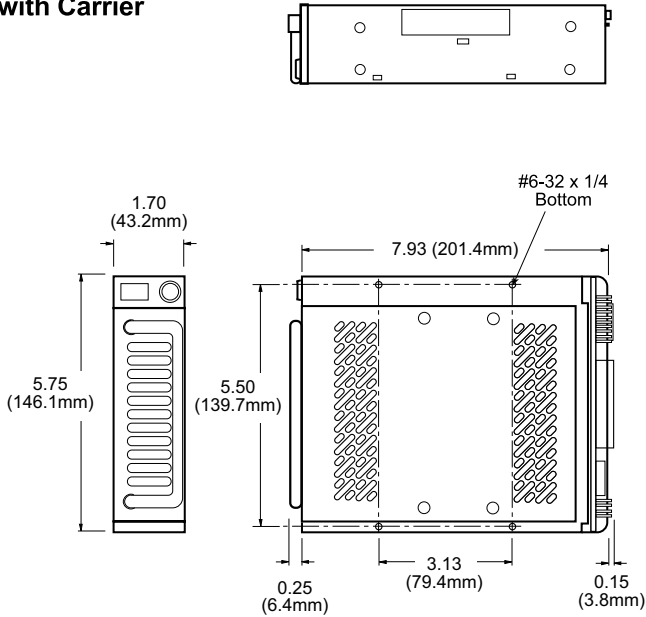
<sup>(1)</sup>With carrier removed.

Chassis Reliability/Maintainability	
MTBF	500,000 Hours
MTTR	5 Minutes
Preventive Maintenance	None

Electrical Specifications	
Input	+5V 65mA +12V 800µA

Fan Air Flow	
1 Fan	3.5 CFM

**Receiving Frame with Carrier**



**Carrier Only**

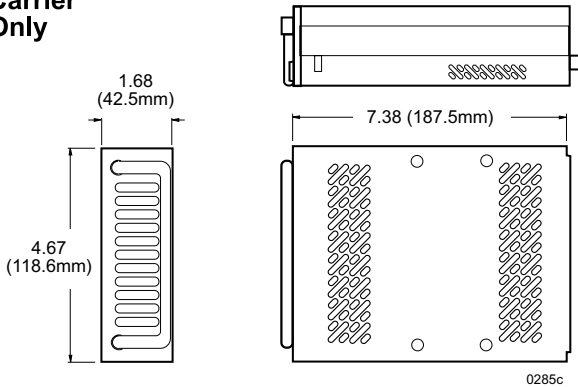


Figure A-1: Ultra320 DE100 Physical Dimensions  
(Dimensions are for reference only)



## Appendix B - Attaching the ON/OFF Key

The following information describes the necessary steps to attach the ON/OFF key to the key lock mechanism so that it is non-removable, preventing accidental key loss. The procedure can be reversed at a later date to revert back to a removable key.

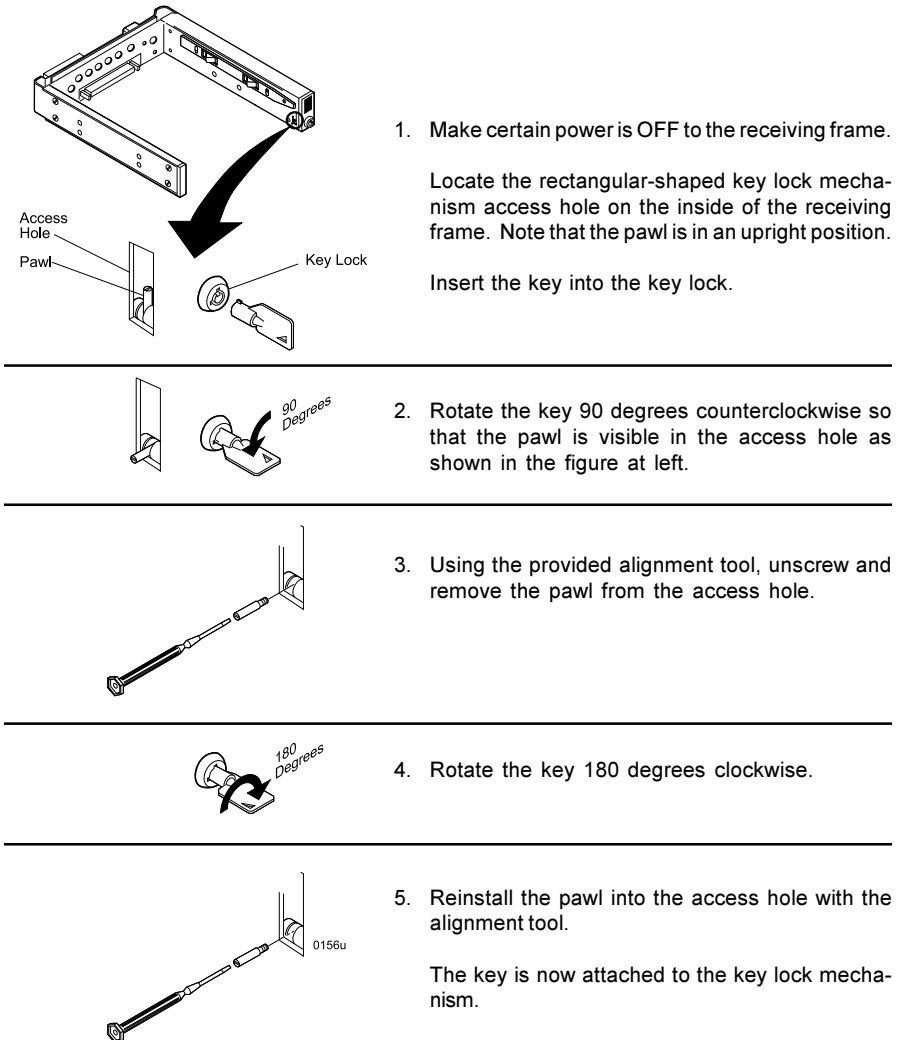
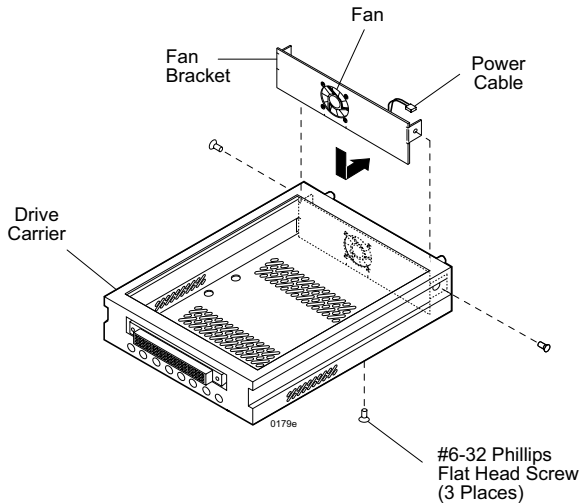


Figure B-1: Attaching the ON/OFF Key

## Appendix C - Field-Replacing the Carrier Fan

**NOTE:** A #2 Phillips screwdriver will be required during this procedure.

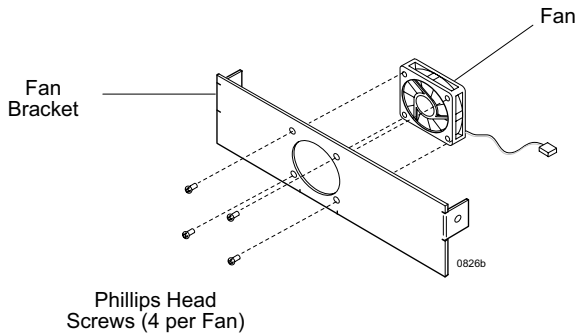
While performing steps in this section, work on a soft surface to prevent excessive shock to the drive and carrier.



*Figure C-1: Removing the Fan Bracket from the Carrier*

The Ultra320 DE100 drive carrier contains one (1) front-mounted drive carrier fan for enhanced heat dissipation. Should the fan ever fail, the unit ID number indicator (located on the front of the receiving frame) will display a flashing "F" and an audible alarm will sound. Refer to section "Receiving Frame Front Panel" in the Introduction for further information.

In the case of failure, the fan is easily field-replaceable as outlined in the steps below.



*Figure C-2: Replacing the Fan*

1. Carefully uninstall drive (if still installed in carrier). Refer to section "*INSTALLATION*" for further information.
2. To remove fan, loosen and remove the three (3) #6-32 Phillips Head screws securing the fan bracket to the drive carrier (Figure C-1).
3. Carefully remove the fan bracket, making sure to disconnect the fan power cable from the drive carrier.
4. Remove the faulty fan by removing the four (4) Philips Head screws securing the fan to the fan bracket (Figure C-2).
5. To install new fan, simply reverse above mentioned steps.

## Appendix D - Optional Accessories

### Carrying Case



*Figure D-1: Carrying Case*

The optional molded plastic carrying case (P/N S20E104) is designed to transport the Ultra320 DE100 carrier from one site to another in a safe, impact and moisture resistant environment. Its compact design, makes it easy to carry and to store. Contact your StorCase dealer for further details and ordering information.

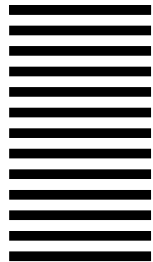
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