

# **ABI PRISM<sup>®</sup> 7000 Sequence Detection System**

Site Preparation and Safety Guide

© Copyright 2001, 2010 Applied Biosystems. All rights reserved.

**For Research Use Only. Not for use in diagnostic procedures.**

**FOR LIMITED LICENSE, PLEASE SEE THE ABI PRISM 7000 SEQUENCE DETECTION SYSTEM USER GUIDE.**

Information in this document is subject to change without notice. Applied Biosystems assumes no responsibility for any errors that may appear in this document. This document is believed to be complete and accurate at the time of publication. In no event shall Applied Biosystems be liable for incidental, special, multiple, or consequential damages in connection with or arising from the use of this document.

ABI PRISM and its design, Applied Biosystems, are registered trademarks of Applied Biosystems or its subsidiaries in the U.S. and certain other countries.

AB (Design) is a trademark of Applied Biosystems or its subsidiaries in the U.S. and certain other countries. All other trademarks are the sole property of their respective owners.

Printed in the USA, 09/2010  
Part Number 4330233 Rev. C

# Contents

## **1 Introduction**

Overview .....	1-1
About the Site Preparation and Safety Guide .....	1-1
In This Guide .....	1-1
About Preinstallation .....	1-2
Preparing Your Site .....	1-2
Choosing a Location .....	1-2
About Safety .....	1-2
Using the Instrument Correctly .....	1-2
Before Operating the Instrument .....	1-2
Documentation User Attention Words .....	1-2
About Chemical Safety .....	1-3
About MSDSs .....	1-3
Ordering MSDSs .....	1-3
Chemical Hazard Warning .....	1-4
Chemical Waste Hazard Warning .....	1-4

## **2 Site Preparation**

Before You Start .....	2-1
Preinstallation .....	2-1
Operator Training .....	2-1
Performance Verification .....	2-1
Ordering Supplies .....	2-1
Unpacking .....	2-1
Preinstallation Checklists .....	2-2
About These Checklists .....	2-2
Components Supplied by Applied Biosystems .....	2-2
On-Site Personnel .....	2-2
Laboratory Facility Requirements .....	2-3
Equipment and Consumables Required .....	2-4
Items Shipped with This Instrument .....	2-5
Summary List .....	2-5
Do Not Move or Unpack Instrument .....	2-5
Unpacking Chemicals .....	2-5
7000 Spectral Dye Calibration Kit .....	2-6
RNase P Instrument Verification Plate .....	2-6

Computer Specifications . . . . .	2-6
Networking . . . . .	2-6
Laboratory Safety Requirements . . . . .	2-7
On-Site Representative . . . . .	2-7
Required Safety Equipment . . . . .	2-7
Laboratory Space Required . . . . .	2-8
Dimensions and Weight . . . . .	2-8
Instrument Location . . . . .	2-8
Computer Location . . . . .	2-9
Assisting the Engineer Move the Instrument . . . . .	2-9
Typical Laboratory Layout . . . . .	2-9
Laboratory Ventilation Requirements . . . . .	2-10
Heat Production . . . . .	2-10
Laboratory Environmental Requirements . . . . .	2-10
Altitude . . . . .	2-10
Temperature and Humidity . . . . .	2-10
Pollution . . . . .	2-10
Emission/Immunity Statement . . . . .	2-10
Electrical Requirements . . . . .	2-11
Power . . . . .	2-11
Power Line . . . . .	2-11
Electrical Outlets . . . . .	2-11
Power Rating . . . . .	2-11
Power Cords . . . . .	2-11
Grounding . . . . .	2-11
Power Line Regulator . . . . .	2-11
Voltage Spikes . . . . .	2-12
Power Outages . . . . .	2-12
Electric Shock Warning . . . . .	2-12

### ***3 Chemical Safety***

Overview . . . . .	3-1
In This Chapter . . . . .	3-1
Material Safety Data Sheets Overview . . . . .	3-2
About MSDSs . . . . .	3-2
Updating MSDSs . . . . .	3-2
Ordering MSDSs from Applied Biosystems . . . . .	3-2
Ordering MSDSs from Other Manufacturers . . . . .	3-2
Hazardous Chemicals . . . . .	3-3
Overview . . . . .	3-3
Handling Hazardous Chemicals . . . . .	3-3

Hazardous Waste .....	3-4
Overview .....	3-4
Handling Chemical Waste .....	3-4
Storing Hazardous Waste .....	3-4
Disposing of Hazardous Waste .....	3-4

## ***4 Instrument Safety***

Overview .....	4-1
In This Chapter .....	4-1
Safe Operation .....	4-1
Routine Maintenance for Safe Operation .....	4-2
Instrument Labeling .....	4-2
Instrument Safety Labels .....	4-2
Signal Words .....	4-2
Parts of an Instrument Safety Label .....	4-2
Examples of Instrument Safety Labels .....	4-2
Labels That May Be Found on the Instrument .....	4-3
Safety Alert Symbols .....	4-4
Electrical Symbols .....	4-4
Nonelectrical Symbols .....	4-4
Safety Alert Symbols (French) .....	4-5
Safety Alert Symbols (German) .....	4-6
Safety Alert Symbols (Italian) .....	4-7
Safety Alert Symbols (Portuguese) .....	4-8
Safety Alert Symbols (Spanish) .....	4-9
Safety Alert Symbols (Chinese) .....	4-10
Safety Alert Symbols (Japanese) .....	4-11
Safety Alert Symbols (Korean) .....	4-12
Safety Alert Symbols (Thai) .....	4-13
Input/Output Connections .....	4-14
Location .....	4-14

## ***A Acronyms and Abbreviations***

Acronyms and Abbreviations Used in Material Safety Data Sheets .....	A-1
Introduction .....	A-1
Organizations, Regulations, and Scientific Terminology .....	A-1
Units of Measure .....	A-2
Chemicals and Other Materials .....	A-3

***B Technical Support and Training***

Services and Support . . . . . B-1  
    Applied Biosystems Web Site. . . . . B-1

# Introduction

---

## Overview

### About the Site Preparation and Safety Guide

The *ABI PRISM 7000 Sequence Detection System Site Preparation and Safety Guide* (P/N 4330233) is sent to all customers who have purchased this Applied Biosystems instrument. This guide provides the information you need to fully prepare your site for the arrival and installation of the instrument. Complete preparation helps ensure a smooth installation process, as well as correct and safe instrument operation.

### In This Guide

This guide for the ABI PRISM® 7000 Sequence Detection System contains the following chapters and appendixes:

Chapter Title	Description
Introduction	Provides orientation to this guide and information about ordering Material Safety Data Sheets (MSDSs)
Site Preparation	Provides installation requirements and the preinstallation checklists
Chemical Safety	Provides general chemical handling guidelines and instrument waste profiles (if any)
Instrument Safety	Explains safety alert symbols on instrument and shows instrument input and output connections
Appendix Title	Description
Acronyms and Abbreviations	Explains terms used in MSDSs and in this guide
Technical Support and Training	Provides contact information for technical support and training

---

## About Preinstallation

---

**Preparing Your Site** Preinstallation checklists start on page 2-2 of this guide. An Applied Biosystems employee will contact you to verify that everything on the checklists has been done before making an appointment for installation.

---

**Choosing a Location** When deciding where to put the instrument, keep in mind the following:

- ◆ You must be able to disconnect the main power supply to the instrument immediately if necessary.
- ◆ You must be able to comply with local, state/provincial, or national air quality regulations while venting the exhaust from this instrument.
- ◆ You must be able to provide easy access to all four sides of the instrument for servicing.

---

## About Safety

---

**Using the Instrument Correctly** Use this instrument as specified by Applied Biosystems. If the instrument is used in a manner not specified by the manufacturer, the protection provided by the instrument may be impaired.

---

**Before Operating the Instrument** Ensure that everyone involved with the operation of the instrument has:

- ◆ Received instruction in general safety practices for laboratories
- ◆ Received instruction in specific safety practices for the instrument
- ◆ Read and understood all related MSDSs

**⚠ CAUTION** Avoid using this instrument in a manner not specified by Applied Biosystems. Although the instrument has been designed to protect the user, this protection can be impaired if the instrument is used improperly.

---

**Documentation User Attention Words** Five user attention words appear in the text of all Applied Biosystems user documentation. Each word implies a particular level of observation or action as described below.

**Note** Calls attention to useful information.

**IMPORTANT** Indicates information that is necessary for proper instrument operation.

**⚠ CAUTION** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

**⚠ WARNING** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

**⚠ DANGER** Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

---



## About Chemical Safety

---

**About MSDSs** Some of the chemicals used with this instrument may be listed as hazardous by their manufacturer. When hazards exist, warnings are prominently displayed on the labels of all chemicals.

Chemical manufacturers supply a current MSDS before or with shipments of hazardous chemicals to new customers and with the first shipment of a hazardous chemical after an MSDS update. MSDSs provide you with the safety information you need to store, handle, transport and dispose of the chemicals safely.

We strongly recommend that you replace the appropriate MSDS in your files each time you receive a new MSDS packaged with a hazardous chemical.

**⚠ WARNING CHEMICAL HAZARD.** Be sure to familiarize yourself with the MSDSs before using reagents or solvents.

---

**Ordering MSDSs** You can order free additional copies of MSDSs for chemicals manufactured or distributed by Applied Biosystems using the contact information below.

To order documents by automated telephone service:

Step	Action
1	From the U.S. or Canada, dial <b>1.800.487.6809</b> , or from outside the U.S. and Canada, dial <b>1.858.712.0317</b> .
2	Follow the voice instructions to order documents (for delivery by fax). <b>Note</b> There is a limit of five documents per fax request.

To order documents by telephone:

<b>In the U.S.</b>	Dial <b>1.800.345.5224</b> , and press <b>1</b> .
<b>In Canada</b>	◆ To order in English, dial <b>1.800.668.6913</b> and press <b>1</b> , then <b>2</b> , then <b>1</b> . ◆ To order in French, dial <b>1.800.668.6913</b> and press <b>2</b> , then <b>2</b> , then <b>1</b> .
<b>From any other country</b>	See the "Applied Biosystems Web Site" on page B-1.

To view, download, or order documents through the Applied Biosystems web site:

Step	Action
1	Go to <a href="http://www.appliedbiosystems.com">http://www.appliedbiosystems.com</a>
2	Click <b>SERVICES &amp; SUPPORT</b> at the top of the page, click <b>Documents on Demand</b> , then click <b>MSDS</b> .
3	Click <b>MSDS Index</b> , search through the list for the chemical of interest to you, then click on the MSDS document number for that chemical to open a PDF version of the MSDS.

For chemicals not manufactured or distributed by Applied Biosystems, call the chemical manufacturer.

---

---

**Chemical Hazard  
Warning**

**⚠ WARNING CHEMICAL HAZARD.** Some of the chemicals used with Applied Biosystems instruments and protocols are potentially hazardous and can cause injury, illness, or death.

- ◆ Read and understand the material safety data sheets (MSDSs) provided by the chemical manufacturer before you store, handle, or work with any chemicals or hazardous materials.
- ◆ Minimize contact with chemicals. Wear appropriate personal protective equipment when handling chemicals (*e.g.*, safety glasses, gloves, or protective clothing). For additional safety guidelines, consult the MSDS.
- ◆ Minimize the inhalation of chemicals. Do not leave chemical containers open. Use only with adequate ventilation (*e.g.*, fume hood). For additional safety guidelines, consult the MSDS.
- ◆ Check regularly for chemical leaks or spills. If a leak or spill occurs, follow the manufacturer's cleanup procedures as recommended on the MSDS.
- ◆ Comply with all local, state/provincial, or national laws and regulations related to chemical storage, handling, and disposal.

---

**Chemical Waste  
Hazard Warning**

**⚠ WARNING CHEMICAL WASTE HAZARD.** Wastes produced by Applied Biosystems instruments are potentially hazardous and can cause injury, illness, or death.

- ◆ Read and understand the material safety data sheets (MSDSs) provided by the manufacturers of the chemicals in the waste container before you store, handle, or dispose of chemical waste.
  - ◆ Handle chemical wastes in a fume hood.
  - ◆ Minimize contact with chemicals. Wear appropriate personal protective equipment when handling chemicals (*e.g.*, safety glasses, gloves, or protective clothing). For additional safety guidelines, consult the MSDS.
  - ◆ Minimize the inhalation of chemicals. Do not leave chemical containers open. Use only with adequate ventilation (*e.g.*, fume hood). For additional safety guidelines, consult the MSDS.
  - ◆ After emptying the waste container, seal it with the cap provided.
  - ◆ Dispose of the contents of the waste tray and waste bottle in accordance with good laboratory practices and local, state/provincial, or national environmental and health regulations.
-

# Site Preparation

---

# 2

## Before You Start

- 
- Preinstallation** Before the ABI PRISM® 7000 Sequence Detection System is installed, the installation site must be prepared so that the instrument can be operated correctly and safely. Follow the requirements presented in “Preinstallation Checklists” on page 2-2, to simplify the installation procedure.
- 
- Operator Training** Training of operators is one of the primary goals of installation. Personnel requiring training should set aside one uninterrupted day to work with the Applied Biosystems service representative on the day of installation. If this is not possible, please call Applied Biosystems Service Administration to reschedule the installation.
- 
- Performance Verification** Calibration of the instrument and verification of performance will be performed by an Applied Biosystems service representative during the installation.
- 
- Ordering Supplies** Before installation, be sure to contact Sales Administration or your sales representative to order the additional supplies necessary for the ongoing operation of the instrument. The chemicals shipped with this instrument will be completely consumed during the installation and initial testing of the instrument.
- 
- Unpacking** Do not unpack instruments. Inspect instrument cartons and report any damage to your Applied Biosystems service representative. For information and instructions about unpacking the Installation Chemical Kit, see “Items Shipped with This Instrument” on page 2-5.
-

## Preinstallation Checklists

**About These Checklists** Use the following preinstallation checklists to ensure that all preparations are made for installing your instrument. All of the personnel and supplies on these checklists are required at the time of installation, but most of them are not supplied by Applied Biosystems. A service representative will contact you to confirm that everything is checked off before making an appointment for installation.

**Components Supplied by Applied Biosystems** The following components are supplied by Applied Biosystems. Check off the items after performing the actions.

√	Date Confirmed	Action
		Received instrument(s) and inspected the crates and boxes.
		Verified that instrument(s), serial number(s), and system configuration, as shown on the packing list and in "Items Shipped with This Instrument" on page 2-5, are the same as ordered.
		Reported any discrepancies in instrument, serial numbers or system configuration, or damage to the crates or boxes to your Applied Biosystems service representative.
		Read all sections of this <i>ABI PRISM 7000 Sequence Detection System Site Preparation and Safety Guide</i> .
		Read the MSDSs provided with the Installation Chemistry Kit.
		Unpacked the Installation Chemistry Kit verifying the contents against the packing list in the kit and/or the list on page 2-5 and page 2-6 of this guide.
		Stored the 7000 Spectral Dye Calibration Kit and the RNase P Instrument Verification Plate, in their boxes, according to the storage conditions listed on page 2-6 of this guide.

**On-Site Personnel** Check off the items below after confirming the following with your laboratory personnel.

√	Date Confirmed	Action
		Have available one uninterrupted day for in-lab training immediately after installation.
		Designated one person to be the laboratory safety representative. This person is familiar with laboratory safety procedures, knows the location of all safety equipment, and must be available to the Applied Biosystems engineer while the engineer is at your facility.
		Designated one person to be present to assist the service engineer in lifting and/or positioning the instrument.

**Laboratory Facility Requirements**

Check off each item as you verify that the instrument location meets each of the requirements.

√	Date Confirmed	Requirement
<b>Safety</b>		
		Met requirements specified in "Laboratory Safety Requirements" on page 2-7.
<b>Instrument Location</b>		
		Verified a pathway from the receiving dock to the storage area (if applicable) to accommodate the instrument's 55.9-cm (22-in.) crated width.
		Verified a pathway from the storage area to the laboratory to accommodate the instrument's 39-cm (15.25-in.) width.
		Laboratory space is of correct dimensions to accommodate the system and its ventilation clearances, and is situated so that the instrument is accessible to the installer on all four sides. See "Laboratory Space Required" on page 2-8.
		Total vertical clearance of 61 cm (24 in.) is provided to remove the cover of the instrument.
		Outlets for the three accessory power cords are within reach of the cords (a power strip is acceptable and generally most convenient.)
		The computer is no more than 3.6 m (12 ft) from the instrument.
		Laboratory bench is of the correct dimensions and weight tolerance to accommodate the system and computer. See "Laboratory Space Required" on page 2-8.
		Situated the computer to allow for proper ergonomics during use.
<b>Ventilation and Waste</b>		
		Established proper handling and disposal method(s) for hazardous chemical waste (if appropriate).
		Verified that room ventilation can accommodate instrument heat output of 2285 Btu/h (675 W).
		Verified that laboratory ventilation can accommodate other environmental requirements as specified in "Laboratory Environmental Requirements" on page 2-10.
<b>Electrical</b>		
		A dedicated 1.5-kVA power line and ground is required for the system. A line conditioner or uninterruptible power supply (UPS) on the power line is recommended.
		One standard power outlet is within 2 m (6.5 ft) of the instrument location, preferably near the back of the instrument.
		Separate power outlet on the same dedicated line is required for the notebook computer.
		Met requirements specified in "Electrical Requirements" on page 2-11.

**Equipment and Consumables Required**

You must supply the following items for installation. Check off each item as you verify its availability.

√	Date Confirmed	Item
		Safety glasses
		Lab coats
		Chemical-resistant disposable gloves

## Items Shipped with This Instrument

---

- Summary List** The 7000 instrument is shipped with the following:
- ◆ ABI PRISM 7000 Sequence Detection System (P/N 4330087) in one box
    - ABI PRISM 7000 instrument (P/N 4328657)
    - 7000 Packing Kit (P/N 4330427)
  - ◆ Notebook computer (P/N 4328434) in one box
  - ◆ Installation Chemistry Kit in one box
    - 7000 Spectral Calibration Kit (P/N 4328895)
    - RNase P Instrument Verification Plate (P/N 4310982)
- 

**Do Not Move or Unpack Instrument** Do not move or unpack instrument cartons. This protects you from liability if any damage occurred during shipping. Inspect instrument cartons, and report any damage to your Applied Biosystems service representative.

**⚠ WARNING PHYSICAL INJURY HAZARD.** Do not move or unpack instrument cartons. This instrument is heavy. Any incorrect lifting or moving of the instrument can cause painful and sometimes permanent back injury. The instrument may tip over if moved or unpacked incorrectly, causing serious injury to persons in its path or damage to the instrument itself. Unpacking the instrument will also void your warranty with Applied Biosystems.

---

**Unpacking Chemicals** You must unpack the Installation Chemistry Kit which is boxed separately from the instrument. Read the MSDSs supplied with the chemicals, and store the components as specified on page 2-6.

**⚠ WARNING CHEMICAL HAZARD.** Some chemicals used with Applied Biosystems instruments are hazardous and can cause injury, illness, or death. Always read the appropriate MSDSs before interacting with the instrument and chemicals in any way. Hazardous Chemical Warnings are prominently displayed on the labels of all hazardous materials.

---

---

---

**7000 Spectral Dye Calibration Kit**

Unpack the box containing the 7000 Spectral Dye Calibration Kit upon receipt. Store the kit in the freezer at –15 to –25 °C. The plates within the kit contain chemicals and reagents as indicated in the table below. The chemicals in the plates of this kit are completely consumed during the installation and initial testing of the instrument.

7000 Spectral Dye Calibration Kit (P/N 4328895)

Description	Shipping Condition	Storage Condition
FAM Spectra Dye Standard	–15 to –25 °C	–15 to –25 °C
VIC Spectra Dye Standard	–15 to –25 °C	–15 to –25 °C
JOE Spectra Dye Standard	–15 to –25 °C	–15 to –25 °C
NED Spectra Dye Standard	–15 to –25 °C	–15 to –25 °C
TAMRA Spectra Dye Standard	–15 to –25 °C	–15 to –25 °C
ROX Spectra Dye Standard	–15 to –25 °C	–15 to –25 °C
SYBR GREEN Spectra Dye Standard	–15 to –25 °C	–15 to –25 °C
Background plate	–15 to –25 °C	–15 to –25 °C

---

---

**RNase P Instrument Verification Plate**

Unpack the shipping box containing the RNase P Instrument Verification Plate upon receipt. Store the box containing the plate as indicated in the table below. The chemicals in the plate are completely consumed during the installation and initial testing of the instrument.

RNase P Instrument Verification Plate (P/N 4310982)

Description	Shipping Condition	Storage Condition
RNase P Instrument Verification Plate	–15 to –25 °C	–15 to –25 °C

---

---

**Computer Specifications**

The computer that accompanies this instrument meets the following minimal requirements: Windows 2000 operating system, 256 MB RAM, 500 MHz processor, 2 GB hard disk drive and a configurable universal serial bus (USB). Do not use this computer for purposes other than operating this instrument.

**IMPORTANT** Do not install optional or unnecessary software. Applied Biosystems reserves the right to remove all software not supplied by Applied Biosystems in order to determine system functionality.

---

---

**Networking**

Applied Biosystems will supply and install, but not support or connect, a network card or install network connections. Customers must make arrangements with their own network administration to have this done concurrent with or immediately after installation of the instrument.

---

---



## Laboratory Safety Requirements

---

**On-Site Representative** We request that a representative from your laboratory be in the vicinity and available to the Applied Biosystems engineer at all times while the engineer is at your facility. This person should be familiar with laboratory safety procedures and know the location of all the safety equipment.

---

**Required Safety Equipment** Your laboratory has specific safety practices and policies designed to protect laboratory personnel from potential hazards that are present. We expect that all applicable safety-related procedures will be followed at all times.

The following safety equipment must be available:

- ◆ Fire extinguisher
    - It is your responsibility to provide appropriate fire extinguishers for use on or near Applied Biosystems equipment.
    - The types and sizes of fire extinguishers shall be suitable for use on electrical and chemical fires as specified in currently prevailing codes, regulations and/or standards, and with the approval of the Fire Marshall or other authority having jurisdiction.
    - The installation of appropriate fire extinguishers shall be in addition to other fire protection systems and not as a substitute or alternative to them.
  - ◆ Eyewash
  - ◆ Safety shower
  - ◆ Eye and hand protection
  - ◆ Adequate ventilation
  - ◆ First-aid equipment
  - ◆ Spill cleanup equipment
  - ◆ Protection from any sources of hazardous chemicals, radiation (lasers, radioisotopes, contaminated equipment, radioactive wastes, etc.) and potentially infectious biological material that may be present in the area where Applied Biosystems engineer(s) will be working
-

## Laboratory Space Required

**Dimensions and Weight** The 7000 instrument and computer system have the following dimensions:

Component	Width	Depth	Height	Weight
7000 instrument, crated	55.9 cm (22 in.)	69.9 cm (27.5 in.)	96.6 cm (38 in.)	49.9 kg (110 lb)
7000 instrument, uncrated	39 cm (15.25 in.)	51 cm (19.75 in.)	53 cm (20.75 in.)	34 kg (75 lb)
7000 instrument with all required clearances	49 cm (19.25 in.)	69 cm (26.75 in.)	114 cm (44.75 in.)	34 kg (75 lb)
Notebook computer (open)	33 cm (13 in.)	28 cm (11 in.)	33 cm (12.25 in.)	3.6 kg (8 lb)
Notebook computer (closed)	33 cm (13 in.)	28 cm (11 in.)	5 cm (2 in.)	3.6 kg (8 lb)

**Note** Computer dimensions and weight are subject to change without notice.

**Instrument Location** Plan on providing sufficient laboratory space for the instrument system as well as the following accommodations:

- ◆ 18 cm (7 in.) of clearance at the rear of the instrument for adequate ventilation.
- ◆ 61 cm (24 in.) of vertical clearance to raise the instrument cover.
- ◆ 5 cm (2 in.) of clearance on each side for instrument cover removal.
- ◆ Access to all four sides of instrument for servicing. Do not block access to the rear of the instrument.
- ◆ Laboratory bench of correct dimensions and weight tolerance to accommodate the system, and a lock-down cable for securing the computer to the bench. A rolling laboratory bench which allows access to all sides of the instrument is recommended.

**IMPORTANT** The laboratory bench should be equipped with a hole for threading the lock-down cable through, or there should be a post adjacent to the bench for wrapping the cable around to secure the computer.

**Note** The post must be anchored at both ends so the cable cannot be slipped off.

---

**Computer Location**

Plan on providing adequate space for the computer.

- ◆ The computer must be no more than 3.6 m (12 ft) from the instrument. Applied Biosystems recommends placing the computer to the right of the system (as viewed from the front), but it can be placed on either side of the instrument.

**IMPORTANT** Placing the computer on top of the 7000 instrument is not recommended.

- ◆ The computer must be situated to allow for proper ergonomics during use. The following guidelines are recommended:
  - Benchspace (or pull-out tray) provided for the notebook computer
  - Open space under the notebook computer so that the operator can sit comfortably, directly facing the computer screen
  - Workspace provided next to the notebook computer

---

**Assisting the Engineer Move the Instrument**

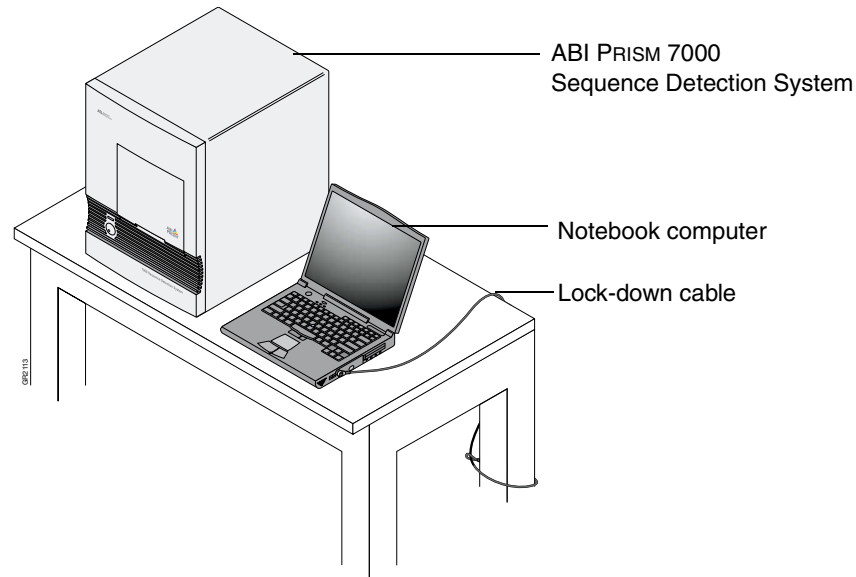
One person will be required to assist the service engineer place the instrument onto the laboratory bench. Do not unpack or move the instrument before the service engineer arrives to install it.

**⚠ WARNING PHYSICAL INJURY HAZARD.** Do not attempt to lift the instrument or any other heavy objects unless you have received related training. Incorrect lifting can cause painful and sometimes permanent back injury. Use proper lifting techniques when lifting or moving the instrument. Two or three people are required to lift the instrument, depending upon instrument weight.

---

**Typical Laboratory Layout**

A typical laboratory layout is shown below.



## Laboratory Ventilation Requirements

---

**Heat Production** The thermal output of the instrument is 2285 Btu/h (~675 W). Consult your facilities department regarding ventilation requirements for this level of heat output.

---

## Laboratory Environmental Requirements

---

**Altitude** This instrument is for indoor use only and for altitudes not exceeding 2000 m (6500 ft) above sea level.

---

**Temperature and Humidity** The laboratory temperature should be maintained at 10 to 35 °C (50 to 95 °F). The instrument can tolerate up to 20% to 80% relative humidity. Avoid placing the instrument adjacent to heaters, cooling ducts, or in direct sunlight.

---

**Pollution** The installation category (overvoltage category) for this instrument is II, and it is classified as portable equipment. The instrument has a pollution degree rating of 2 and may be installed in an environment that has nonconductive pollutants only.

---

**Emission/Immunity Statement** For our European customers, any product marked with the CE label meets the European EMC Directive 89/336/EEC and the Low Voltage Directive 72/23/EEC. This product meets Class B emission limits.

---



## Electrical Requirements

---

**Power** **IMPORTANT** You must be able to disconnect the main power supply to the instrument immediately if necessary.

The following table specifies the electrical operating range for the instrument in various parts of the world:

Location	Voltage (VAC)	Frequency	Amperage (A)
Japan	100 $\pm$ 10%	50/60 Hz $\pm$ 1%	9
USA/Canada	120 $\pm$ 10%	50/60 Hz $\pm$ 1%	8
EC	230 $\pm$ 10%	50/60 Hz $\pm$ 1%	4
UK	240 +6%/-10%	50/60 Hz $\pm$ 1%	4
Australia	240 +6%/-10%	50/60 Hz $\pm$ 1%	4

---

**Power Line** The electrical receptacle must have a dedicated 1.5 kVA power line and ground or a 1.5 kVA power line with a line conditioner or uninterruptible power supply (UPS). A line conditioner or UPS is recommended.

---

**Electrical Outlets** The electrical receptacle must be located within 2 m (6.5 ft) of the instrument rear panel. Do not use extension cords.

---

**Power Rating** This instrument is rated for a maximum output of 1000 VA or 1000 W.

---

**Power Cords** The instrument is supplied with a Universal Voltage Kit (P/N 603615) which contains a cord compatible with the electrical wiring used in the country in which the instrument is installed.

The notebook computer is supplied with appropriate cords for the installation site. The cords can be plugged into any standard electrical receptacle after the notebook computer is configured for the proper voltage.

---

**Grounding** Certain types of electrical noise are greatly exaggerated by poor or improper electrical ground connections. To prevent these problems, it is very important to have a dedicated line and ground between the instrument and building main electrical service.

---

**Power Line Regulator** In areas where the supplied power is subject to voltage fluctuations exceeding  $\pm$ 10% of the nominal value (above), a power line regulator may be required. High or low voltages can have adverse effects on the electronic components of the instrument.

---

---

**Voltage Spikes** Short-duration, high-voltage spikes often cause random failures in microprocessor-controlled instrumentation. These spikes can be caused by other devices using the same power source (refrigerators, air conditioners, and centrifuges) or by outside influences such as lightning. A dedicated line and ground between the instrument and building main electrical service will prevent such problems.

If your environment contains devices that are electrically noisy or you are in an area with frequent electrical storms, a line conditioner with a recommended capacity of 1.5 kVA will enhance the reliability of your system.

---

**Power Outages** The instrument has been designed to pause from short periods of power outage (loss). To continue operation you must resume the run from the software, provided that the line voltage did not become excessively noisy before the outage. If you want increased protection during a power outage, install a UPS with a capacity of 1.5 kVA.

**IMPORTANT** Power interruption beyond several seconds results in terminated communication between the notebook computer and the 7000 instrument.

---

**Electric Shock Warning** **⚠ WARNING ELECTRICAL SHOCK HAZARD.** Severe electrical shock, which could cause physical injury or death, can result from working on an instrument when the high-voltage power supply is operating. To avoid electrical shock, disconnect the power supply to the instrument, unplug the power cord, and wait at least 1 minute before working on the instrument.

---

# *Chemical Safety*

---

# 3

## Overview

---

**In This Chapter** This chapter contains general information about handling hazardous chemicals and waste. It also contains information for the ABI PRISM® 7000 Sequence Detection System about:

- ◆ Material safety data sheets (MSDSs)
- ◆ Hazardous waste produced (if any) during the installation procedure
- ◆ Hazardous waste produced during typical use of the instrument, if appropriate

Applied Biosystems assumes that all operations in your laboratory will be conducted in accordance with safety practices detailed in the MSDSs for the chemicals used in your laboratory, and with all local, state/provincial, or national regulations.

---

## Material Safety Data Sheets Overview

---

**About MSDSs** Some of the chemicals used with this instrument may be listed as hazardous by their manufacturer. When hazards exist, warnings are prominently displayed on the labels of all chemicals.

MSDSs are supplied by the chemical manufacturer and provide information about:

- ◆ Physical characteristics
- ◆ Safety precautions
- ◆ Health hazards
- ◆ First aid
- ◆ Spill cleanup
- ◆ Disposal procedures

**⚠ WARNING CHEMICAL HAZARD.** Be sure to familiarize yourself with the MSDSs before using reagents or solvents.

Explanations of acronyms and abbreviations used in MSDSs can be found in Appendix A of this guide.

---

**Updating MSDSs** Chemical manufacturers supply a current MSDS before or with shipments of hazardous chemicals to new customers, and with the first shipment of a hazardous chemical after an MSDS update.

Replace the MSDSs in your files regularly so that the safety information is current.

---

**Ordering MSDSs from Applied Biosystems** You can order free additional copies of MSDSs for chemicals manufactured or distributed by Applied Biosystems. See “Ordering MSDSs” on page 1-3 for details.

---

**Ordering MSDSs from Other Manufacturers** Applied Biosystems does not furnish MSDSs for chemicals used on this instrument that are not manufactured or distributed by Applied Biosystems. Contact the manufacturer(s) of those chemicals to obtain additional MSDSs.

---



## Hazardous Chemicals

---

**Overview** This instrument may use chemicals that are hazardous.

**⚠ WARNING CHEMICAL HAZARD.** Hazardous chemicals used with this instrument can cause injury, illness, or death. Handle all chemicals as potentially hazardous.

Chemicals are classified as hazardous when they are physically hazardous or if they can cause acute or chronic health hazards upon exposure.

- ◆ Physically hazardous chemicals are materials that are flammable, combustible, under compression (gases), explosive, oxidative, organically peroxidic, pyrophoric, reactive or unstable, or water reactive.
- ◆ Chemicals that may cause health hazards include carcinogens; materials that are toxic or highly toxic; reproductive toxins; irritants; corrosives; sensitizers; materials that are toxic to the liver, kidney or blood-forming (hematopoietic) system; and agents that damage the lungs, skin, eyes, or mucous membranes.

---

**Handling Hazardous Chemicals** Here are some of the important requirements for handling hazardous chemicals:

- ◆ Read and understand all applicable MSDSs before handling hazardous chemicals.
- ◆ Always wear gloves, safety glasses, and protective clothing when handling chemicals.
- ◆ Always provide adequate ventilation when handling chemicals. Some chemicals require handling only in a properly functioning fume hood.
- ◆ Provide secondary containment for all reagent bottles.
- ◆ Do not store chemicals in direct sunlight or heat (on or off the instrument).

**⚠ WARNING BOTTLE FRACTURING HAZARD.** When replacing reagents, always install a new bottle on the instrument. Do not add new solution to previously used reagent bottles. Some chemicals reduce the integrity of glass bottles. As a result, repeated use beyond 6 weeks may result in the bottle fracturing when it is pressurized during operation.

---

## Hazardous Waste

---

**Overview** This instrument does not generate any hazardous waste. Some applications may use the instrument to read plates that contain hazardous materials but the instrument does not come in contact with the hazardous waste.

---

**Handling Chemical Waste** When handling chemical waste we strongly recommend that you:

- ◆ Read all applicable MSDSs before handling or disposing of hazardous waste.
- ◆ Ensure that the waste container is correctly installed.
- ◆ Always handle hazardous materials beneath a fume hood that is connected in accordance with all installation requirements.
- ◆ Always wear chemical-resistant gloves, safety glasses, and protective clothing when handling hazardous waste material.
- ◆ During transfer, ensure that the waste container is tightly sealed with the waste cap provided.
- ◆ Dispose of hazardous waste in accordance with all local, state/provincial, or national regulations.

---

**Storing Hazardous Waste** **▲ WARNING CHEMICAL STORAGE HAZARD.** Never collect or store waste in a glass container because of the risk of breaking or shattering. Reagent and waste bottles can crack and leak. Each waste bottle should be secured in a low-density polyethylene safety container with the cover fastened and the handles locked in the upright position. Wear appropriate eyewear, clothing, and gloves when handling reagent and waste bottles.

The following are guidelines for storing hazardous waste:

- ◆ Always use secondary containment when storing chemical waste.
  - ◆ Store waste for only short periods of time.
  - ◆ Store only small amounts of waste in the laboratory.
  - ◆ Store waste away from direct sunlight or sources of heat (on or off the instrument).
- 

**Disposing of Hazardous Waste** As the generator of potentially hazardous waste, it is your responsibility to:

- ◆ Characterize the waste generated with your applications.
- ◆ Ensure the health and safety of all personnel in your laboratory.
- ◆ Ensure that instrument waste is stored, transferred, transported, and disposed of according to all local, state/provincial, or national regulations.

---

# *Instrument Safety*

---

# 4

## Overview

---

**In This Chapter** This chapter provides you with the safety information you need to prepare your laboratory and personnel for the installation and use of the ABI PRISM® 7000 Sequence Detection System. The safety labels and safety alert symbols that may be found on this instrument are provided in several languages. The inputs and outputs for the instrument are also provided.

---

**Safe Operation** This guide provides only site preparation information. Before operating this instrument, read the information in the *ABI PRISM 7000 Sequence Detection System User Guide* (P/N 4330228) concerning hazards and potential hazards. Ensure that anyone involved with the operation of the instrument is instructed both in general safety practices for laboratories and in specific safety practices for the instrument.

Detailed safety information on the following topics is included in the user guide for this instrument:

- ◆ Electrical safety
  - ◆ Lamp safety
  - ◆ Hot surfaces safety
  - ◆ Pinch points safety
-

**Routine Maintenance for Safe Operation**

Maintain the instrument in good working order. If the instrument has been subjected to adverse environmental conditions (such as fire, flood, or earthquake), an Applied Biosystems service representative should inspect the instrument.

We recommend that an Applied Biosystems service representative check the instrument yearly to verify that:

- ◆ The safety interlocks protecting the user from various hazards are working properly.
- ◆ The protective housing is functional. Loose or distorted panels will not protect the user or the equipment.
- ◆ Airflow is not hindered in any way.

## Instrument Labeling

**Instrument Safety Labels**

Safety labels are located on the instrument. Each safety label has three parts:

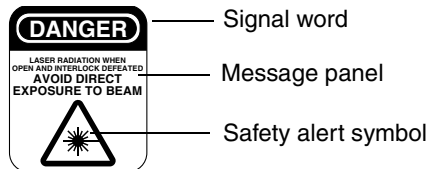
- ◆ A signal word panel, which implies a particular level of observation or action (*e.g.*, CAUTION or WARNING). If a safety label encompasses multiple hazards, the signal word corresponding to the greatest hazard is used.
- ◆ A message panel, which explains the hazard and any user action required.
- ◆ A safety alert symbol, which indicates a potential personal safety hazard. See “Safety Alert Symbols” on page 4-4 for an explanation of all the safety alert symbols. This information is provided in several languages.

**Signal Words**

- ◆ **CAUTION** indicates a potentially hazardous situation that could result in minor or moderate injury to the user or damage to the instrument.
- ◆ **WARNING** indicates a potentially hazardous situation that could result in death or serious injury.
- ◆ **DANGER** indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury (most extreme).

**Parts of an Instrument Safety Label**

Parts of an instrument safety label are identified below.



**Examples of Instrument Safety Labels**

Below are some examples of instrument safety labels.












**Labels That May Be Found on the Instrument**

The following Danger, Caution, and Warning labels, listed in English and French, may be found on your instrument:



<b>English</b>	<b>French</b>
CAUTION: Hazardous chemicals. Read the Material Safety Data Sheets (MSDSs) before handling.	ATTENTION: Produits chimiques dangereux. Lire les fiches techniques de sûreté de matériels avant la manipulation des produits.
CAUTION: Hazardous waste. Read the waste profile before handling or disposal.	ATTENTION: Déchets dangereux. Lire les renseignements sur les déchets avant de les manipuler ou de les éliminer.
WARNING: Risk of electric shock. Disconnect power cord from supply before replacing fuses or removing power supply module from instrument.	AVERTISSEMENT: Risque de choc électrique. Débrancher le cordon d'alimentation avant de remplacer les fusibles ou de retirer le bloc d'alimentation de l'instrument.
WARNING: For continued protection against risk of fire, replace only with Listed and Certified fuse of the specified type and ratings.	AVERTISSEMENT: Pour une protection continue contre les risques d'incendie, utiliser uniquement des fusibles agréés et certifiés du type et du courant nominal spécifiés.
WARNING: Hot lamp	AVERTISSEMENT: Lampe brûlante.
WARNING: Hot. Replace lamp with an Applied Biosystems lamp.	AVERTISSEMENT: Composants brûlants. Remplacer la lampe par une lampe Applied Biosystems.
WARNING: Disconnect supply cord before opening. Grounding circuit continuity is vital for safe operation of equipment. Never operate equipment with grounding conductor disconnected.	AVERTISSEMENT: Débrancher le cordon d'alimentation avant d'ouvrir. La continuité du circuit de masse est essentiel à la sécurité du fonctionnement de l'appareil. Ne jamais utiliser l'appareil avec la prise de terre débranchée.
WARNING: For protection against fire hazard, replace only same type and rating of fuse.	AVERTISSEMENT: Pour assurer la protection contre les risques d'incendie, remplacer uniquement par un fusible de même type et de même courant nominal.
CAUTION: Hot.	ATTENTION: Surface brûlante.
DANGER: High voltage.	DANGER: Haute tension.
WARNING: To reduce the chance of electrical shock, do not remove covers that require tool access. No user serviceable parts are inside. Refer servicing to Applied Biosystems qualified service personnel.	AVERTISSEMENT: Pour éviter les risques d'électrocution, ne pas retirer les capots dont l'ouverture nécessite l'utilisation d'outils. L'instrument ne contient aucune pièce réparable par l'utilisateur. Toute intervention doit être effectuée par le personnel de service qualifié de Applied Biosystems.
DANGER: Laser radiation when open and interlock defeated. Avoid direct exposure to beam.	DANGER: Rayonnement laser en cas d'ouverture et d'une neutralisation des dispositifs de sécurité. Eviter toute exposition directe avec le faisceau.
CAUTION: Moving parts.	ATTENTION: Parties mobiles.

## Safety Alert Symbols

**Electrical Symbols** The following chart is an illustrated glossary of all electrical symbols that are used on Applied Biosystems instruments. Whenever such symbols appear on instruments, please observe appropriate safety procedures.










	This symbol indicates the On position of the main power switch.
	This symbol indicates the Off position of the main power switch.
	This symbol indicates the On/Off position of a push-push main power switch.
	This symbol indicates that a terminal may be connected to another instrument's signal ground reference. This is not a protected ground terminal.
	This symbol indicates that this is a protective grounding terminal that must be connected to earth ground before any other electrical connections are made to the instrument.
	A terminal marked with this symbol either receives or delivers alternating current or voltage.
	A terminal marked with this symbol can receive or supply an alternating and a direct current or voltage.
	This symbol indicates the presence of high voltage and warns the user to proceed with caution.
	This symbol alerts you to consult the manual for further information and to proceed with caution.

**Nonelectrical Symbols** The following is an illustrated glossary of all nonelectrical safety alert symbols found on Applied Biosystems instruments.



	This symbol illustrates a heater hazard. Proceed with caution when working around these areas to avoid being burned by hot components.
	This symbol indicates that a laser is present inside the instrument.

## Symboles des alertes de sécurité

**Symboles électriques** Le tableau suivant donne la signification de tous les symboles électriques qui figurent sur les appareils Applied Biosystems. En présence de l'un de ces symboles, il est impératif de se conformer aux consignes de sécurité appropriées.

	Position marche de l'interrupteur d'alimentation principale.
	Position arrêt de l'interrupteur d'alimentation principale.
	Positions marche-arrêt de l'interrupteur d'alimentation principale à bouton poussoir.
	Borne pouvant être reliée à la mise à la terre d'un autre appareil. Ce n'est pas une borne de mise à la terre protégée.
	Borne de mise à la terre de protection devant être reliée à la terre avant d'effectuer tout autre raccordement électrique à l'appareil.
	Borne recevant ou fournissant une tension ou un courant de type alternatif.
	Borne pouvant recevoir ou fournir une tension ou un courant de types alternatif et continu.
	Indique la présence d'une haute tension et avertit l'utilisateur de procéder avec précaution.
	Avertit l'utilisateur de la nécessité de consulter le manuel pour obtenir davantage d'informations et de procéder avec précaution.

**Symboles non électriques** Le tableau suivant donne la signification des symboles d'alertes de sécurité non électriques qui figurent sur les appareils Applied Biosystems.



	Danger associé à la présence d'un appareil de chauffage. Procéder avec précaution pour éviter de se brûler au contact de pièces ou d'éléments chauds.
	Indique que l'appareil renferme un laser.

## Sicherheitswarnsymbole

**Elektrische Symbole** Die folgende Tabelle enthält Beschreibungen aller auf den Geräten von Applied Biosystems verwendeten elektrischen Symbole. Wenn diese Symbole auf den Geräten erscheinen, beachten Sie bitte die entsprechenden Sicherheitsmaßnahmen.

	Dieses Symbol zeigt die Ein-Position des Hauptnetzschalters an.
	Dieses Symbol zeigt die Aus-Position des Hauptnetzschalters an.
	Dieses Symbol zeigt die Ein/Aus-Position eines einrastenden Hauptnetzdruckschalters an.
	Dieses Symbol zeigt an, daß ein Anschluß an die Betriebserdung eines anderen Geräts angeschlossen werden kann. Dies ist keine geschützte Erdklemme.
	Dieses Symbol zeigt eine geschützte Erdklemme an, die geerdet werden muß, bevor andere elektrische Anschlüsse zum Gerät hergestellt werden.
	Ein mit diesem Symbol gekennzeichneteter Anschluß kann Wechselstrom oder -spannung erhalten oder abgeben.
	Ein mit diesem Symbol gekennzeichneteter Anschluß kann Wechselstrom oder -spannung und Gleichstrom oder -spannung erhalten oder abgeben.
	Dieses Symbol zeigt das Vorliegen von Hochspannung an und warnt den Anwender, vorsichtig vorzugehen.
	Dieses Symbol fordert Sie auf, das Handbuch zwecks näherer Informationen zu konsultieren und vorsichtig vorzugehen.

**Nicht-elektrische Symbole** Die folgende Tabelle enthält Beschreibungen aller auf den Geräten von Applied Biosystems verwendeten nicht-elektrischen Symbole.

	Dieses Symbol zeigt eine Gefahr durch die Heizung an. Gehen Sie vorsichtig vor, wenn Sie in der Nähe dieser Bereiche arbeiten, damit Sie sich nicht an heißen Komponenten verbrennen.
	Dieses Symbol zeigt das Vorliegen eines Lasers im Innern des Geräts an.





## Simboli degli allarmi di sicurezza

**Simboli elettrici** La tabella seguente è un glossario illustrato di tutti i simboli elettrici utilizzati su strumenti Applied Biosystems. Ogni volta che tali simboli compaiono sugli strumenti, rispettare le procedure di sicurezza appropriate.

	Questo simbolo indica la posizione On dell'interruttore di alimentazione generale.
	Questo simbolo indica la posizione Off dell'interruttore di alimentazione generale.
	Questo simbolo indica la posizione On/Off di un interruttore di alimentazione generale a pulsante.
	Questo simbolo indica che un terminale può essere collegato alla messa a terra di un altro strumento. Non è un terminale di terra protetto.
	Questo simbolo indica un terminale protettivo di messa a terra che deve essere collegato a terra prima di realizzare qualsiasi altro collegamento elettrico allo strumento.
	Un terminale contrassegnato con questo simbolo riceve o fornisce tensione o corrente alternata.
	Un terminale contrassegnato con questo simbolo può ricevere o fornire tensione o corrente alternata e continua.
	Questo simbolo indica la presenza di alta tensione e invita l'utente a procedere con cautela.
	Questo simbolo invita l'utente a consultare il manuale per ulteriori informazioni e a procedere con cautela.

**Simboli non elettrici** Segue un glossario illustrato dei simboli degli allarmi di sicurezza non elettrici trovati su strumenti Applied Biosystems.



	Questo simbolo illustra un rischio di alte temperature. Procedere con cautela quando si lavora in queste aree per evitare ustioni causate da componenti a temperature elevate.
	Questo simbolo indica la presenza di laser nello strumento.

## Símbolos de alerta de segurança

**Símbolos elétricos** A tabela a seguir constitui um glossário ilustrado de todos os símbolos elétricos usados nos instrumentos Applied Biosystems. Sempre que um desses símbolos aparecer num instrumento, siga os procedimentos adequados de segurança.

	Este símbolo indica que o interruptor de energia elétrica está na posição ligado.
	Este símbolo indica que o interruptor de energia elétrica está na posição desligado.
	Este símbolo indica a posição ligado/desligado de um interruptor principal de energia elétrica do tipo botão de pressão.
	Este símbolo indica que um terminal pode estar conectado a uma referência de aterramento de sinal de um outro instrumento. Este não é um terminal terra protegido.
	Este símbolo indica que este é um terminal de aterramento de proteção, que deve ser ligado à terra antes de se fazer qualquer outra ligação elétrica ao instrumento.
	Um terminal marcado com este símbolo recebe ou transmite tensão ou corrente alternada.
	Um terminal marcado com este símbolo recebe ou fornece tensão ou corrente alternada ou contínua.
	Este símbolo indica a presença de alta tensão e avisa o usuário para proceder com cuidado.
	Este símbolo serve como alerta, para que se consulte o manual a fim de se obter mais informações e que se proceda com cuidado.

**Símbolos não-elétricos** A seguir, apresentamos um glossário ilustrado de todos os símbolos de alerta de segurança não relacionados à electricidade encontrados nos instrumentos Applied Biosystems.



	Este símbolo representa um perigo devido a aquecedor no local. Proceda com cuidado ao trabalhar em áreas próximas a aquecedores, para evitar queimaduras devidas ao contato com componentes quentes.
	Este símbolo indica que há um laser dentro do instrumento.

## Símbolos de alerta de seguridad

**Símbolos eléctricos** En la siguiente tabla se muestra un glosario ilustrado de todos los símbolos eléctricos que se utilizan en los instrumentos de Applied Biosystems. Cuando tales símbolos figuran en los instrumentos, lleve a cabo los procedimientos de seguridad apropiados.

	Este símbolo indica la posición de encendido del interruptor principal.
	Este símbolo indica la posición de apagado del interruptor principal.
	Este símbolo indica la posición de encendido/apagado de un interruptor principal de presión.
	Este símbolo indica que existe la posibilidad de conectar esta terminal a la toma de tierra de referencia de otro instrumento. Ésta no es una toma de tierra protegida.
	Este símbolo indica que la toma de tierra protegida debe ser conectada a tierra antes de realizar cualquier otro tipo de conexión eléctrica al instrumento.
	Una terminal marcada con este símbolo recibe o suministra corriente o tensión alterna.
	Una terminal marcada con este símbolo puede recibir o suministrar corriente o tensión alterna y continua.
	Este símbolo indica la presencia de alta tensión y advierte al usuario que proceda con precaución.
	Este símbolo indica que consulte el manual para obtener más información y que proceda con precaución.

**Símbolos no eléctricos** A continuación se presenta un glosario ilustrado de todos los símbolos de seguridad y alerta no eléctricos que aparecen en los instrumentos de Applied Biosystems.



	Este símbolo indica peligro de altas temperaturas. Proceda con cautela cuando trabaje cerca de estas zonas para evitar quemarse con componentes calientes.
	Este símbolo indica que hay un láser dentro del instrumento.

## 安全警告符號

**電源符號** 下列為 Applied Biosystems 公司儀器之電源符號所代表的意思。每當儀器上出現這些符號時，請依照適當的安全程序操作。

	本符號表示主電源開關處於「開」的位置。
	本符號表示主電源開關處於「關」的位置。
	本符號表示按鍵式主電源開關的「開 / 關」位置。
	本符號表示此接線端可能與另一儀器的接地端相連接，但並非安全接地端。
	本符號表示此端須先接好安全地線，然後方可在此儀器上進行其它電連接。
	本符號表示可接受或提供交流電源。
	本符號表示可接受或提供交流以及直流電源。
	本符號表示此處有高壓電，小心處理。
	本符號表示請查閱操作手冊並小心處理。

**非電源符號** 下列為 Applied Biosystems 公司儀器之非電源符號所代表的意思：



	本符號表示燙熱，在此類區域工作時須小心處理以免燙傷。
	此符號表示儀器內含有雷射光（激光）。

## 安全上の警告マーク

電気に関するマーク Applied Biosystems 装置に使用されている全ての電気に関するマークを下表に示します。このようなマークが装置に表示されている場合は、安全上、該当する指示を必ず守ってください。

	主電源スイッチのオンの位置を示します。
	主電源スイッチのオフの位置を示します。
	押しボタン式主電源スイッチのオン / オフの位置を示します。
	この表示は、端子を別の機器のグラウンドに接続できることを示します。これはグラウンド保護端子ではありません。
	この装置に電氣的接続を行う前に、アースに接続する必要があるグラウンド端子を示します。
	この表示は、交流電流又は交流電圧の出力又は入力端子を示します。
	この表示は、交流及び直流の電流又は電圧の出力又は入力端子を示します。
	高電圧のため注意が必要です。
	詳細についてはマニュアルを参照した上で、注意して行ってください。

電気以外のマーク 次に示すマークは Applied Biosystems 装置で使用されている電気以外の安全上のマークです。



	このマークはヒータに関する危険を示します。この表示のある周囲で作業する場合は、部品が高温になっているため火傷を負わないように注意が必要です。
	装置内にレーザーを用いていることを示します。

## 안전 경보 기호

**전기 기호** 다음의 차트는 Applied Biosystems 기기에서 사용되는 모든 전기 기호들의 도해 해설입니다. 이런 기호가 기기 상에 표시된 경우, 적합한 안전 절차를 항상 준수해야 합니다.

	이 기호는 주 전원 스위치가 켜짐 임을 나타냅니다.
	이 기호는 주 전원 스위치가 꺼짐 임을 나타냅니다.
	이 기호는 푸쉬푸쉬 주 전원 스위치가 켜짐/꺼짐 됨을 나타냅니다.
	이 기호는 전극이 다른 기기의 신호 접지 레퍼런스에 연결되었을 수 있음을 나타냅니다. 이것은 보호되는 접지 전극이 아닙니다.
	이 기호는 기기에 어떠한 전기 연결이 되기전에 접지로 반드시 연결되어야 하는 보호되는 접지 전극임을 나타냅니다.
	이 기호가 있는 전극은 교류 또는 전압을 받거나 보낼 수 있습니다.
	이 기호가 있는 전극은 교류 및 직류 또는 전압을 받거나 공급할 수 있습니다.
	이 기호는 고압이 흐름을 나타내며 사용자들이 주의할 것을 경고합니다.
	이 기호는 더 자세한 정보를 얻기 위해 설명서를 참고할 것을 알리며 주의할 것을 알려줍니다.

**비 전기 기호** 다음의 차트는 Applied Biosystems 기기에서 발견되는 비 전기 안전 경고의 도해 해설입니다.

	이 기호는 가열 위험을 나타냅니다. 이 주변에서 작업할 때는 뜨거운 부품에 의한 화상을 피하기 위해 주의해야 합니다.
	이 기호는 레이저가 기기내에 존재함을 나타냅니다.

# เครื่องหมายเตือนเพื่อความปลอดภัย



## เครื่องหมายที่เกี่ยวข้องกับไฟฟ้า

แผนภูมิต่อไปนี้ ทำไว้เพื่ออธิบายความหมายของเครื่องหมายต่างๆ ที่ใช้ในเครื่องวัดชนิดต่างๆ ของ Applied Biosystems โปรดปฏิบัติตามขั้นตอนที่เหมาะสมเพื่อรักษาความปลอดภัย ทุกครั้งที่เครื่องหมายประเภทนี้ได้ปรากฏบนเครื่องวัดชนิดใด

	เครื่องหมายนี้ แสดงตำแหน่งเปิด ของสวิตช์กำลังหลัก
	เครื่องหมายนี้ แสดงตำแหน่งปิด ของสวิตช์กำลังหลัก
	เครื่องหมายนี้ แสดงตำแหน่งเปิด-ปิด ของสวิตช์กำลังหลักชนิดผลัก-ผลัก
	เครื่องหมายนี้ แสดงว่าขั้วต่อสามารถเชื่อมต่อกับสายดินร่วมกับสายดินของสัญญาณอ้างอิงของเครื่องวัดอีกเครื่องหนึ่ง ซึ่งไม่ใช่ขั้วต่อลงดินที่ได้รับการป้องกัน
	เครื่องหมายนี้ แสดงว่ามีขั้วต่อลงดินเพื่อความปลอดภัยอยู่อันหนึ่งที่ต้องเชื่อมต่อกับสายลงดินก่อนที่จะสามารถทำการต่อไฟอื่นใดกับเครื่องวัดนี้ได้
	ขั้วต่อที่ติดเครื่องหมายนี้ ได้รับหรือส่งกระแสหรือแรงดันสลับ
	ขั้วต่อที่ติดเครื่องหมายนี้ สามารถรับหรือจ่ายกระแสหรือแรงดันไฟฟ้าทั้งกระแสสลับและกระแสตรงได้
	เครื่องหมายนี้แสดงว่ามีกระแสแรงดันสูง และเตือนผู้ใช้เครื่องว่าจะต้องทำงานด้วยความระมัดระวัง
	เครื่องหมายนี้ไว้เพื่อเตือนผู้ใช้เครื่องว่า จะต้องดูรายละเอียดเพิ่มเติมในคู่มือแล้วทำงานด้วยความระมัดระวัง

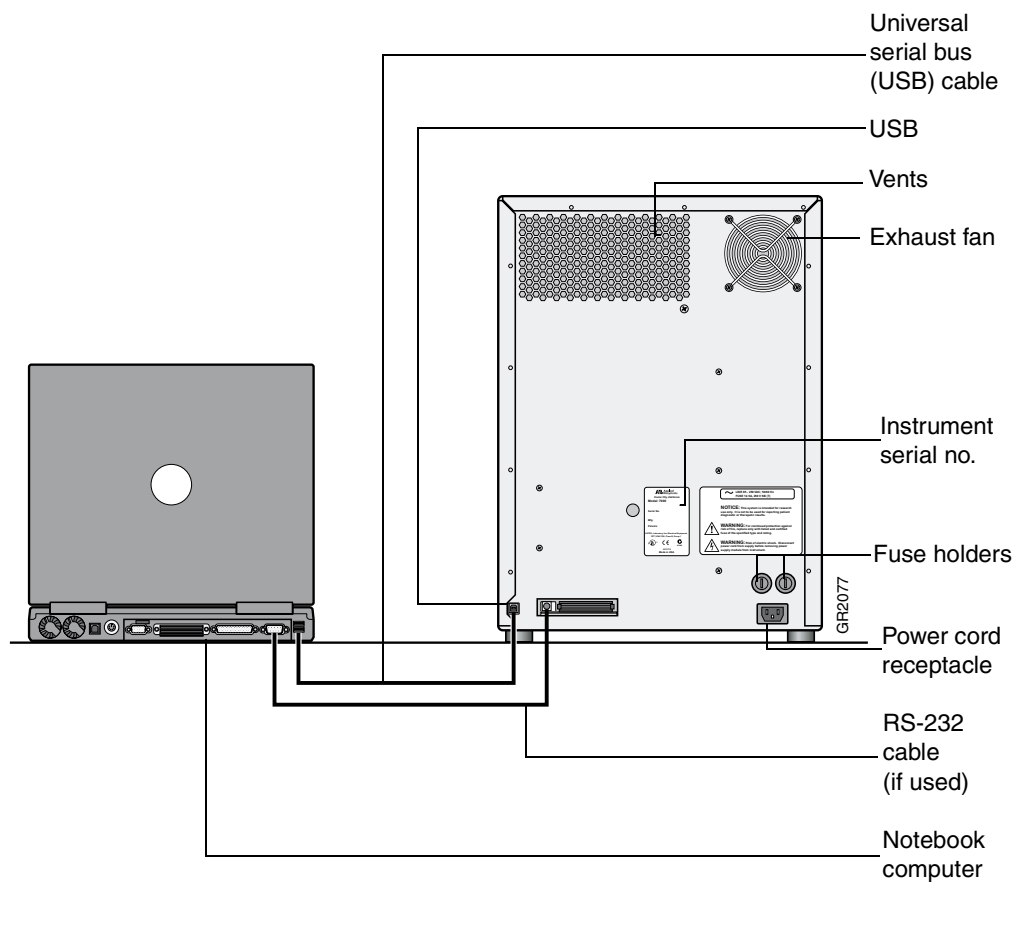
## เครื่องหมายที่ไม่เกี่ยวข้องกับไฟฟ้า

ข้อความต่อไปนี้ เขียนไว้เพื่ออธิบายความหมายของเครื่องหมายเตือนอันตรายต่างๆ ที่ไม่เกี่ยวข้องกับไฟฟ้า และปรากฏบนเครื่องวัดชนิดต่างๆ ของ Applied Biosystems

	เครื่องหมายนี้ แสดงภาวะอันตรายที่เกิดจากเครื่องทำความร้อน จึงใช้ความระมัดระวังในขณะที่ทำงานในบริเวณเหล่านี้ เพื่อหลีกเลี่ยงไม่ให้อุณหภูมิสูงขึ้นส่วนใด ๆ ที่ร้อนจัด
	เครื่องหมายนี้ แสดงว่ามีเลเซอร์อยู่ภายในเครื่องวัดนี้

## Input/Output Connections

**Location** The locations of the input/output connections on the 7000 instrument are shown in the figure below. The input/output connections are also labeled on the instrument.





# Acronyms and Abbreviations



## Acronyms and Abbreviations Used in Material Safety Data Sheets

**Introduction** Material Safety Data Sheets (MSDSs) use acronyms and abbreviations for certain organizations, government regulations, common scientific terminology, units of measurement, chemicals, and other materials. This appendix is provided to help you understand these references while reading the MSDSs for the chemicals used in your laboratory.

**Organizations, Regulations, and Scientific Terminology** The following table lists acronyms and abbreviations for organizations, government regulations, and scientific terminology:

Abbreviation	Explanation
ACGIH	American Conference of Governmental Industrial Hygienists
CAS#	Chemical Abstract Service Reference Number for Specific Pure Chemical
cc	Closed cup testing of flash point
CFR	Code of Federal Regulations. Regulations published by the United States Government
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act (Superfund) is a federal law administered by EPA
DFG MAK	Federal Republic of Germany's Maximum Contamination Value in the workplace (similar to PEL in the USA)
DOT	United States Department of Transportation, regulates transportation of hazardous material (USA)
EPA	United States Environmental Protection Agency, regulates use, disposal, or emission of hazardous material (USA)
IDLH	Immediate Danger to Life and Health
LC <sub>LO</sub>	Lowest published lethal concentration
LC <sub>50</sub>	Lethal concentration in air that kills 50% of a specified population
LD <sub>50</sub>	Lethal dose that kills 50% of a specified population
LEL	Lower explosion limit
MSHA	Mine Safety and Health Administration, recommends respirators
NFPA	National Fire Protection Association, publishes recommended regulations for local or state governments in the United States (hazardous rating system developed by this association)
NIOSH	National Institute of Occupational Safety and Health (USA) recommends exposure levels and respirators
oc	Open cup testing for flash point

<b>Abbreviation</b>	<b>Explanation</b>
OSHA	Occupational Safety and Health Administration (USA), sets chemical exposure levels
PEL	Permissible exposure limit; the federal OSHA limit, usually expressed as time weighted average (TWA) for an 8-hour work shift
PPM	Parts per million
Prop 65	A California law requiring warnings for chemicals that are known to the state to be carcinogenic or to cause reproductive harm
RCRA	Resource Conservation and Recovery Act
RTECS	Registry of Toxic Effects of Chemical Substances
SARA	Superfund Amendments and Reauthorization Act; a federal act administered by EPA
SCBA	Self-Contained Breathing Apparatus
STCC	Standard Transportation Commodity Code
STEL	Short Term Exposure Level, published by ACGIH
TC <sub>LO</sub>	Lowest published toxic concentration
TLV	Threshold limit value; the ACGIH-recommended TWA, usually for an 8-hour work shift
TWA	Time weighted average
UEL	Upper explosive limit
u or U	Unknown
UN	United Nations. This designation identifies hazardous chemicals in the process of worldwide transportation.

**Units of Measure** The following table lists abbreviations for common units of measure:

<b>Abbreviation</b>	<b>Unit of Measure</b>
#	number
°C	degrees Celsius
°F	degrees Fahrenheit
µL	microliter
µm	micron
µmol	micromole
AUFS	absorbency units full-scale
Btu	British thermal unit
ft	foot
gal	gallon
h	hour
i.d.	inside diameter
in.	inch
kVA	kilovoltampere
L	liter
m	meter
mg	milligram

Abbreviation	Unit of Measure
mL	milliliter
mm	millimeter
o.d.	outside diameter
psi	pounds per square inch
sec	second
V	volt
VA	volt ampere
VAC	volts, alternating current
W	watt

**Chemicals and Other Materials** The following table lists some common abbreviations for chemicals, protecting groups and materials used in peptide and DNA synthesis.

Abbreviation	Definition
A	adenine
AA	amino acid
Ac	acetyl
Act	acetylimidazole
Acm	acetamidomethyl
Ac <sub>2</sub> O	acetic anhydride
ACN	acetonitrile
ACT	activator vessel
BHA resin	benzhydramine resin
Boc	tert-butyloxycarbonyl
Bzl	benzyl
Br-Z	2-bromobenzyloxycarbonyl
t-Bu	tert-butyl
C	cytosine
CHO	formyl
CH <sub>3</sub> Bzl	4-methylbenzyl
CH <sub>3</sub> OBzl	4-methoxybenzyl
Cl-Z	2-chlorobenzyloxycarbonyl
CPG	controlled pore glass
DCA	dichloroacetic acid
DCC	dicyclohexylcarbodiimide
DCM	dichloromethane
DCU	dicyclohexylurea
DIEA	diisopropylethylamine
DMAP	4-dimethylaminopyridine
DMF	dimethylformamide
DMSO	dimethylsulfoxide
DNA	deoxyribonucleic acid

Abbreviation	Definition
Dnp	2,4-dinitrophenyl
Et	ethyl
EtOH	ethanol
Fmoc	9-fluorenylmethyloxycarbonyl
G	guanine
HBTU	<i>N</i> -[( <i>H</i> -benzotriazol-1-yl) (dimethylamino)methylene]- <i>N</i> -methylanaminium hexafluorophosphate <i>N</i> -oxide, formerly 2-(1 <i>H</i> -benzotriazol-1-yl)-1,1,3,3-tetramethyl-uronium hexafluorophosphate
HLP	high loaded polystyrene
HMP resin	<i>p</i> -hydroxymethylphenoxyethyl-polystyrene resin
HOAc	acetic acid
HOBt	1-hydroxybenzotriazole
MBHA resin	4-methylbenzhydrylamine resin
MeOH	methanol
Mob	4-methoxybenzyl
Mtr	4-methoxy-2,3,6-trimethyl-benzene sulfonyl
Mts	mesitylene-2-sulfonyl
NMI	1-methylimidazole
NMP	<i>N</i> -methylpyrrolidone, <i>N</i> -methyl-2-pyrrolidone
OEt	ethyl ester
OMe	methyl ester
PAM resin	phenylacetamidomethyl resin
PEG	polyethylene glycol
RV	reaction vessel
SPPS	solid-phase peptide synthesis
T	thymine
<i>t</i> -Boc	tert-butyloxycarbonyl
TETD	tetraethylthiuram disulfide
TFA	trifluoroacetic acid
TFMSA	trifluoromethane sulfonic acid
THF	tetrahydrofuran
Tos	4-toluenesulfonyl (tosyl)
Tri	trityl
U	uracil
Z	benzyloxycarbonyl

# *Technical Support and Training*

---

# B

## Services and Support

---

### Applied Biosystems Web Site

To access the Applied Biosystems Web site, go to:

**<http://www.appliedbiosystems.com>**

At the Applied Biosystems Web site, you can:

- ◆ Search through frequently asked questions (FAQs)
- ◆ Submit a question directly to Technical Support
- ◆ Order Applied Biosystems user documents, MSDSs, certificates of analysis, and other related documents
- ◆ Download PDF documents
- ◆ Obtain information about customer training
- ◆ Download software updates and patches

In addition, the Applied Biosystems Web site provides a list of telephone and fax numbers that can be used to contact Technical Support.

---





---

**Headquarters**

850 Lincoln Centre Drive  
Foster City, CA 94404 USA  
Phone: +1 650.638.5800  
Toll Free (In North America): +1 800.345.5224  
Fax: +1 650.638.5884

**Worldwide Sales and Support**

Applied Biosystems vast distribution and service network, composed of highly trained support and applications personnel, reaches into 150 countries on six continents. For sales office locations and technical support, please call our local office or refer to our web site at [www.appliedbiosystems.com](http://www.appliedbiosystems.com) or to the Technical Support and Training appendix in this document.

---

**[www.appliedbiosystems.com](http://www.appliedbiosystems.com)**

---



Applied Biosystems is committed to providing the world's leading technology and information for life scientists.

Printed in the USA, 09/2010  
Part Number 4330233 Rev. C