

ABI PRISM™ 6700 Automated Nucleic Acid Workstation

Site Preparation and Safety Guide

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Introduction

Overview

About the Site Preparation and Safety Guide

The *ABI PRISM™ 6700 Automated Nucleic Acid Workstation Site Preparation and Safety Guide* is sent to all customers who have purchased an 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 6700 Automated Nucleic Acid Workstation contains the following chapters and appendix:

Title	Description
Introduction	Provides orientation to this guide and Customer Support contact information
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
Acronyms and Abbreviations	Explains terms used in Material Safety Data Sheets (MSDSs) and in this guide

About Preinstallation

Preparing Your Site Preinstallation checklists start on page 2-5 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.

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.

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 Material Safety Data Sheets (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.

About Waste Disposal

As the generator of potentially hazardous waste, it is your responsibility to perform the actions listed below.

- ◆ Characterize (by analysis if necessary) the waste generated by the particular applications, reagents, and substrates used in your laboratory.
- ◆ Ensure the health and safety of all personnel in your laboratory.
- ◆ Ensure that the instrument waste is stored, transferred, transported, and disposed of according to all local, state/provincial, or national regulations.

Note Radioactive or biohazardous materials may require special handling, and disposal limitations may apply.

Chemical Hazard Warning

▲ WARNING CHEMICAL HAZARD. Some of the chemicals used with 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 chemical manufacturer before you store, handle, or work with any chemicals or hazardous materials.
 - ◆ Minimize contact with and inhalation of chemicals. Wear appropriate personal protective equipment when handling chemicals (*e.g.*, safety glasses, gloves, or clothing). For additional safety guidelines consult the MSDS.
 - ◆ Do not leave chemical containers open. Use only with adequate ventilation.
 - ◆ 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 and inhalation of chemical waste. Wear appropriate personal protective equipment when handling chemicals (*e.g.*, safety glasses, gloves, or protective clothing).
- ◆ 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.

Technical Support

To Reach Technical Support Through the Internet

We strongly encourage you to visit our Web site for answers to frequently asked questions and for more information about our products. You can also order technical documents or an index of available documents and have them faxed or e-mailed to you through our site. The Applied Biosystems Web site address is:

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

To submit technical questions from North America or Europe:

Step	Action
1	Access the Applied Biosystems Technical Support Web site.
2	Under the Troubleshooting heading, click Support Request Forms , then select the relevant support region for the product area of interest.
3	In the Personal Assistance form, enter the requested information and your question, then click Ask Us RIGHT NOW .
4	In the Customer Information form, enter the requested information and your question, then click Ask Us RIGHT NOW . Within 24 to 48 hours, you will receive an e-mail reply to your question from an Applied Biosystems technical expert.

To Contact ABI PRISM 6700 Technical Support

In the United States and Canada, technical support for this instrument is available in the following ways:

To contact Technical Support by...	Use...
Telephone	1-800-762-4001 , Press 6 5:30 a.m. to 5:00 p.m. Pacific Time
Fax	1-240-453-4613
E-mail	pcrlab@appliedbiosystems.com

See "Regional Offices Sales and Service" on page 1-8 for sales and service representatives outside of the United States and Canada.

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 MSDSs...	Then...							
Over the Internet	<p>a. Go to our Web site at www.appliedbiosystems.com/techsupp</p> <p>b. Click MSDSs</p> <table border="1"> <thead> <tr> <th>If you have...</th> <th>Then...</th> </tr> </thead> <tbody> <tr> <td>The MSDS document number or the Document on Demand index number</td> <td>Enter one of these numbers in the appropriate field on this page</td> </tr> <tr> <td>The product part number</td> <td rowspan="2">Select Click Here, then enter the part number or keyword(s) in the field on this page.</td> </tr> <tr> <td>Keyword(s)</td> </tr> </tbody> </table> <p>c. You can open and download a PDF (using Adobe® Acrobat® Reader™) of the document by selecting it, or you can choose to have the document sent to you by fax or email.</p>	If you have...	Then...	The MSDS document number or the Document on Demand index number	Enter one of these numbers in the appropriate field on this page	The product part number	Select Click Here , then enter the part number or keyword(s) in the field on this page.	Keyword(s)
If you have...	Then...							
The MSDS document number or the Document on Demand index number	Enter one of these numbers in the appropriate field on this page							
The product part number	Select Click Here , then enter the part number or keyword(s) in the field on this page.							
Keyword(s)								
By automated telephone service	Use "Documents on Demand" on page 1-7.							
By telephone in the United States	Dial 1-800-327-3002 , then press 1 .							
By telephone from Canada	<table border="1"> <thead> <tr> <th>To order in...</th> <th>Then dial 1-800-668-6913 and...</th> </tr> </thead> <tbody> <tr> <td>English</td> <td>Press 1, then 2, then 1 again</td> </tr> <tr> <td>French</td> <td>Press 2, then 2, then 1</td> </tr> </tbody> </table>	To order in...	Then dial 1-800-668-6913 and...	English	Press 1 , then 2 , then 1 again	French	Press 2 , then 2 , then 1	
To order in...	Then dial 1-800-668-6913 and...							
English	Press 1 , then 2 , then 1 again							
French	Press 2 , then 2 , then 1							
By telephone from any other country	See "Regional Offices Sales and Service" on page 1-8.							

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

Documents on Demand Free, 24-hour access to Applied Biosystems technical documents, including MSDSs, is available by fax or e-mail or by download from our Web site.

To order documents...	Then...
by index number	a. Access the Applied Biosystems Technical Support Web site at http://www.appliedbiosystems.com/techsupp b. Click the Index link for the document type you want, then find the document you want and record the index number. c. Use the index number when requesting documents following the procedures below.
by phone for fax delivery	a. From the U.S. or Canada, call 1-800-487-6809 , or from outside the U.S. and Canada, call 1-858-712-0317 . b. Follow the voice instructions to order the documents you want. Note There is a limit of five documents per request.
through the Internet for fax or e-mail delivery	a. Access the Applied Biosystems Technical Support Web site at http://www.appliedbiosystems.com/techsupp b. Under Resource Libraries , click the type of document you want. c. Enter or select the requested information in the displayed form, then click Search . d. In the displayed search results, select a check box for the method of delivery for each document that matches your criteria, then click Deliver Selected Documents Now (or click the PDF icon for the document to download it immediately). e. Fill in the information form (if you have not previously done so), then click Deliver Selected Documents Now to submit your order. Note There is a limit of five documents per request for fax delivery but no limit on the number of documents you can order for e-mail delivery.

To Obtain Customer Training Information The Applied Biosystems Training Web site provides course descriptions, schedules, and other training-related information. The Web site address is:
www.appliedbiosystems.com/techsupp/training.html

**Regional Offices
Sales and Service**

Outside North America

Region	Telephone Dial...	Fax Dial...
Africa and the Middle East		
Africa (English Speaking) and West Asia (Fairlands, South Africa)	27 11 478 0411	27 11 478 0349
Africa (French Speaking; Courtaboeuf Cedex, France)	33 1 69 59 85 11	33 1 69 59 85 00
South Africa (Johannesburg)	27 11 478 0411	27 11 478 0349
Middle Eastern Countries and North Africa (Monza, Italia)	39 (0)39 8389 481	39 (0)39 8389 493
Eastern Asia, China, Oceania		
Australia (Scoresby, Victoria)	61 3 9730 8600	61 3 9730 8799
China (Beijing)	86 10 64106608 or 86 800 8100497	86 10 64106617
Hong Kong	852 2756 6928	852 2756 6968
India (New Delhi)	91 11 653 3743/3744	91 11 653 3138
Korea (Seoul)	82 2 593 6470/6471	82 2 593 6472
Malaysia (Petaling Jaya)	60 3 79588268	603 79549043
Singapore	65 896 2168	65 896 2147
Taiwan (Taipei Hsien)	886 2 2358 2838	886 2 2358 2839
Thailand (Bangkok)	66 2 719 6405	66 2 319 9788
Europe		
Austria (Wien)	43 (0)1 867 35 75 0	43 (0)1 867 35 75 11
Belgium	32 (0)2 532 4484	32 (0)2 582 1886
Czech Republic and Slovakia (Praha)	420 2 35365189	420 2 35364314
Denmark (Naerum)	45 45 58 60 00	45 45 58 60 01
Finland (Espoo)	358 (0)9 251 24 250	358 (0)9 251 24 243
France (Paris)	33 (0)1 69 59 85 85	33 (0)1 69 59 85 00
Germany (Weiterstadt)	49 (0) 6150 101 0	49 (0) 6150 101 101
Hungary (Budapest)	36 (0)1 270 8398	36 (0)1 270 8288
Italy (Milano)	39 (0)39 83891	39 (0)39 838 9492
Norway (Oslo)	47 23 12 06 05	47 23 12 05 75
Poland, Lithuania, Latvia, and Estonia (Warszawa)	48 (22) 866 40 10	48 (22) 866 40 20
Portugal (Lisboa)	351 (0)22 605 33 14	351 (0)22 605 33 15
Russia (Moskva)	7 502 935 8888	7 502 564 8787
South East Europe (Zagreb, Croatia)	385 1 34 91 927/838	385 1 34 91 840
Spain (Tres Cantos)	34 (0)91 806 1210	34 (0)91 806 1206
Sweden (Stockholm)	46 (0)8 619 4400	46 (0)8 619 4401
Switzerland (Rotkreuz)	41 (0)41 799 7777	41 (0)41 790 0676
The Netherlands (Nieuwerkerk a/d IJssel)	31 (0)180 392400	31 (0)180 392409 or 31 (0)180 392499

Region	Telephone Dial...	Fax Dial...
United Kingdom (Warrington, Cheshire)	44 (0)1925 825650	44 (0)1925 282502
All other countries not listed (Warrington, UK)	44 (0)1925 282481	44 (0)1925 282509
Japan		
Japan (Hacchobori, Chuo-Ku, Tokyo)	8120 477392 (Toll free within Japan) or 81 3 5566 6230	81 0 477120 (Toll free within Japan) or 81 3 5566 6507

Latin America		
Caribbean countries, Mexico, and Central America	52 55 35 3610	52 55 66 2308
Brazil	0 800 704 9004 or 55 11 5070 9654	55 11 5070 9694/95
Argentina	800 666 0096	55 11 5070 9694/95
Chile	1230 020 9102	55 11 5070 9694/95
Uruguay	0004 055 654	55 11 5070 9694/95

Site Preparation

2

Overview

About This Chapter This chapter describes the preparation of the laboratory and personnel that must take place before the ABI PRISM™ 6700 Automated Nucleic Acid Workstation arrives. It also describes the instrument installation process.

In This Chapter This chapter contains the following topics:

Topic	See Page
Before You Start	2-2
Preinstallation and Installation Overviews	2-3
Preinstallation Checklists	2-5
Items Shipped with This Instrument	2-10
Laboratory Safety Requirements	2-14
Laboratory Space Required	2-15
Laboratory Ventilation Requirements	2-18
Laboratory Environmental Requirements	2-18
Electrical Requirements	2-19

Before You Start

-
- Preinstallation** Before the 6700 system is installed, the installation site must be prepared so that the instrument can operate correctly and safely. To simplify the installation procedure, follow the requirements presented in “Preinstallation Checklists” on page 2-5.
-
- Operator Training** Training of operators is one of the primary goals of installation. The “Overview of the Installation Process” on page 2-4 shows the blocks of time each user should set aside to work with the Applied Biosystems service representative during the installation process. If it is not possible to schedule this training time, 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.
-

Preinstallation and Installation Overviews

Overview of Preinstallation Process

The table below summarizes the stages of the preinstallation process.

Stage	Person Responsible	Action
1	Customer	Customer orders instrument from Applied Biosystems.
2	Applied Biosystems Service Administration	For customers in the United States, Service Administration alerts third-party movers, who will be responsible for unpacking the instrument and positioning it in the laboratory.
3	Third-Party Movers	Third-party movers contact the customer to arrange a convenient schedule for unpacking and positioning the instrument in the laboratory. If the movers do not contact you in a timely manner, please call Applied Biosystems Service Administration.
4	Applied Biosystems Shipping Dept.	The shipping department ships the 6700 Starter Kit (Chemistry Install Kit and Plastics Install Kit) and the Site Preparation and Safety Guide to arrive at the customer site before the instrument. The instrument arrives (via air freight) at the customer's loading dock/storage area.
5	Customer	Customer performs the following steps: <ol style="list-style-type: none"> a. Read the Site Preparation and Safety Guide. b. Open the Chemistry Install Kit box. c. Read the MSDSs provided in the shipment. d. Check the contents of the Chemistry Install Kit, Plastic Consumables box and Packing Kit with their invoices (or the lists on 2-11 through 2-13). e. Unpack and store chemical reagents.
6	Customer	Customer performs all of the preparations in the Preinstallation Checklists beginning on page 2-5.
7	Third-Party Movers	Third-party movers arrive, unpack, and position the instrument on the laboratory bench or table.
8	Applied Biosystems Service Administration	Shortly after the instrument is delivered, a service engineer calls the customer to verify that: <ul style="list-style-type: none"> ◆ All the preparations on the preinstallation checklists have been performed ◆ All components of the 6700 Starter Kit have arrived
9	Applied Biosystems Service Administration	Service Administration generates a service request for instrument installation and customer training.
10	Applied Biosystems Service Engineer	A service engineer calls to arrange a date for the 2-day installation and customer training process.

Overview of the Installation Process

The table below summarizes the tasks the Applied Biosystems Service Engineer performs during the 2-day installation and customer training process and indicates the personnel who must be present during the procedure.

	Database Admin^a	Inform. Tech (IT)^b	Primary Contact^c	Scientist^d	Operator^e
Day 1 Tasks					
SDS Verification			X		
6700 Workstation Setup	X	X	X		
6700 Workstation Configuration and Tests			X	X	
6700 Workstation Performance Verification			X	X	
Day 2 Tasks					
6700 Workstation Run Analysis	X		X	X	X
6700 Workstation Training	X	X	X	X	X

- a. See "Preinstallation Checklists" on page 2-5, for the Database Administrator's skills requirements.
- b. The Information Technologist needs to be present if the instrument will be networked at the time of installation.
- c. See "Preinstallation Checklists" on page 2-5, for the Primary Contact person's responsibilities.
- d. Scientists are responsible for creating or changing protocols and running/maintaining the instrument.
- e. Operators are responsible for running/maintaining the instrument but cannot create or change protocols.

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 the appropriate number of containers were delivered. Reported any damage or discrepancies to your Applied Biosystems service representative.
		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 2-10, 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 Site Preparation and Safety Guide.
		Read and understand the MSDSs provided with the Installation Chemistry Kit.
		Unpacked and stored the contents of Chemistry Install Kit, checking the contents against the invoice or the list on page 2-11.
		Checked the contents of the Plastics Install Kit against the invoice or the list on page 2-12.
		Checked the contents of the Packing Kit against the invoice or the list on page 2-13.

On-Site Personnel Check off the items below after scheduling them with your laboratory personnel.

√	Date Confirmed	Action
		Set aside 2 uninterrupted days for in-lab training for appropriate personnel during installation. See "Overview of the Installation Process" on page 2-4 for details.
		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 will be available to the Applied Biosystems engineer while the engineer is at your facility.
		Designated one person as the Information Technologist (IT). This person will be responsible for supplying the service engineer with any information required to network the computer system.
		Designated one person as the laboratory database administrator. This person is familiar with operating a Microsoft® Windows NT™ server and using Oracle® database software.

Laboratory Facility Requirements

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

√	Date Confirmed	Requirement
Safety		
		Met requirements specified in "Laboratory Safety Requirements" on page 2-14.
Instrument Location		
		Verified that the doors, hallways, and staircases from the receiving dock to the storage area (if applicable) and to the laboratory will accommodate the instrument's 91-cm (36-in.) crated width.
		A laboratory bench of the correct dimensions to accommodate the system is in place and is situated so that the instrument is accessible to the installer on all four sides. The bench supporting the instrument must have sturdy casters, and be able to tolerate at least 225 kg (500 lbs). See "Laboratory Space Required" on page 2-15 for details.
		A second bench or computer cart is in place. It must have the correct dimensions and weight tolerance to accommodate the Windows NT Database Client CPU and monitor (which can be stacked), server tower, keyboard, mouse, and handheld barcode reader. These items together weigh 56.2 kg (125 lbs). See "Laboratory Space Required" on page 2-15 for details.
		Verified that the final instrument location has at least 153 cm (60 in.) of total vertical clearance (table top to ceiling) and 15 cm (6 in.) of rear clearance. IMPORTANT The instrument will not be installed without this clearance.
		The CPUs will be no more than 1.25 m (4 ft) from the instrument.
		Met other requirements specified in "Laboratory Space Required" on page 2-15.
		Met requirements specified in "Laboratory Environmental Requirements" on page 2-18.
		Verified that third-party movers will unpack the instrument and position it on the laboratory bench.
		Situated the computer to allow for proper ergonomics during use.
Ventilation and Waste		
		Room ventilation accommodates instrument heat output of ~2730 Btu/h (~0.8 kw).
		Established proper handling and disposal method(s) for hazardous chemical waste (and biological waste, if applicable).

√	Date Confirmed	Requirement
Electrical		
		A dedicated power line and ground for the 6700 system is strongly recommended.
		A line conditioner or uninterruptible power supply (UPS) on the power line is recommended. Applied Biosystems recommends Smart UPS SeriesSU1400NET manufactured by Applied Power Conversion (APC).
		One standard power outlet within 2.5 m (8.0 ft) of the instrument location is required, preferably near the back of the instrument.
		Separate power outlets on the same dedicated line are required for the CPUs, monitor, and printer and tape backup system (if any).
		Met requirements specified in "Electrical Requirements" on page 2-19.

Equipment and Consumables Required

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

√	Date Confirmed	Item
		ABI PRISM® 7700 or 7900HT Sequence Detection System, available on both days of installation
		A tape backup system is highly recommended. Applied Biosystems recommends the Exabyte 8700 (Eliant 820) SW 14-GB 8-mm tape backup. The dimensions for this system are: 23 cm (9 in.) width x 28 cm (11 in.) depth x 8 cm (3 in.) height; weight ~2.2 kg (5 lbs)
		PC-compatible printer (optional)
		There is no Internet hub in the installation kit. If you plan to add the 6700 Client and Server computers to your network, then you must supply the following: <ul style="list-style-type: none"> ◆ 2 active ethernet ports ◆ 2 IP addresses, including all TCP/IP information If these are not available at the time of installation, the Client will be networked to the server directly, using an ethernet crossover cable.
		Thirty (30) high density, 1.44 MB capacity, 3.5-in. floppy disks, IBM formatted. A binder with plastic disk-storage sleeves or a box for disk storage is highly recommended.
		A large centrifuge that will accommodate 96-well reaction plates and generates a minimum of 1400 <i>x g</i>
		Microcentrifuge
		Ice bucket and wet ice
		Vortex mixer
		Laboratory freezer, -20 °C
		Additional computer supplies (paper, disks, etc.)
		Micropipettes and tips (Pipetman models P20, P200, P1000; or Eppendorf 1–10 µL, 10–100 µL, and 100–1000 µL)
		Safety glasses and lab coats
		Chemical-resistant disposable gloves

Items Shipped with This Instrument

- Summary List** The 6700 instrument is shipped with the following for the 96 well output block:
- ◆ ABI PRISM 6700 Automated Nucleic Acid Workstation
 - Includes Waste Bottle Vac Station, 4 L (P/N 4308297) and System Fluid Bottle, 4 L (P/N 4311646) each with secondary containment
 - ◆ *ABI PRISM 6700 Automated Nucleic Acid Workstation User's Manual* (P/N 4304309)
 - ◆ *Database Installation and Administration for the ABI PRISM 6700 Nucleic Acid Workstation* (P/N 4314342)
 - ◆ Chemistry Install Kit (P/N 4308328), for the 96 well output block
 - ◆ Plastics Install Kit (P/N 4313514), for the 96 well output block
 - ◆ Packing Kit (P/N 4307886A)
 - ◆ Database Server CPU (P/N 4308104)
 - ◆ Software Kit (P/N 4307885), consisting of:
 - ABI PRISM 6700 Software CD-ROM (P/N 4314498)
 - Oracle v. 8.5.1 Server CD-ROM (P/N 4314497)
 - ◆ Database Client CPU with keyboard and mouse (P/N 4309181), monitor (P/N 4307697), and switching box (P/N 4313543)
-

- 6700, 384 Well Upgrade Kit** The 6700, 384 Well Upgrade Kit (P/N 4326908) may be ordered separately or at the same time as the instrument. The following parts are shipped to the customer:
- ◆ 6700, 384 Well Upgrade Chemistry
 - ◆ 384 Block (P/N 4325705)
 - ◆ Heat seal clip (P/N 4327564)
 - ◆ 6700 System Software v. 1.1 Kit (P/N 4327588)
 - ◆ *ABI PRISM 6700 Automated Nucleic Acid Workstation User's Manual*, updated with 384 option (P/N 4304309)
 - ◆ Plastic consumables for the 384 well upgrade
-

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.

Do not attempt to lift the instrument carton. The third-party movers will move the carton to the laboratory, unpack it, and position it on the bench. For details, see "Overview of Preinstallation Process" on page 2-3.

⚠ 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 Chemistry Install Kit, which is boxed separately from the instrument. Read the MSDSs supplied with the chemicals, and store the components as specified under “6700 Chemistry Install Kit for the 96 Well Output Block” on page 2-11.

⚠ 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.

**6700 Chemistry
Install Kit for the
96 Well Output
Block**

Unpack the 6700 Chemistry Install Kit (P/N 4308328) upon receipt, and store the chemicals and reagents as indicated in the table below. The chemicals in this kit are completely consumed during the installation and initial testing of the instrument. Please verify that all items are present. The verification plates will be tested on the ABI PRISM® 7700 Sequence Detection System.

Note The 6700 Chemistry Install Kit will be shipped before the instrument arrives.

P/N	Description	Quantity	Storage Conditions
4305901	ABI PRISM™ 6700 Cell Lysate Control Kit (1 tube High CLC, 1 tube Low CLC, 0.6 mL High and 0.6 mL Low RNA Standards)	2 kits	-15 to -25 °C
4308329	TaqMan® Ribosomal RNA Control Reagents (VIC™ Dye)	2 kits	
4310982	TaqMan® RNase P Instrument Verification Plate	2 plates	2 to 8 °C
4309169	TaqMan® One-Step RT Master Mix Reagents Kit	3 kits	
4308456	Model 6700 System Fluid	1 bottle	Room temperature
4305893	Nucleic Acid Purification Elution Solution	2 bottles	
4305895	Nucleic Acid Purification Lysis Solution	2 bottles	
4305891	RNA Purification Wash Solution 1	2 bottles	
4305890	RNA Purification Wash Solution 2	2 bottles	

6700, 384 Well Upgrade Chemistry

Unpack the 6700, 384 Well Upgrade Chemistry upon receipt, and store the chemicals and reagents as indicated in the table below. The chemicals in this kit are completely consumed during the installation and initial testing of the instrument. Please verify that all items are present. The verification plates will be tested on the ABI PRISM® 7900HT Sequence Detection System.

P/N	Description	Quantity	Storage Conditions
4327317	DNA Template Kit, 384 Well Verification for ABI Prism™ 6700 Workstation	1 kit	-15 to -25 °C
4304437	2X Universal Master Mix Kit	1 kit	
4316831	RNase P Detection Reagents Kit	2 kits	
4323306	TaqMan® RNase P Instrument Verification Plate 384 Well	1 plate	2 to 8 °C

Plastic Consumables for the 96 Well Output Block

The Plastics Install Kit (P/N 4313514) containing the following plastic consumables for the 96 well output block is also shipped with the instrument. The supplies in this kit are completely consumed during the installation and initial testing of the instrument. Please verify that all of these items are present. These plastic consumables will be used on the ABI PRISM® 7700 Sequence Detection System.

P/N	Description	Quantity
4311758	6700 Splash Guards	1 box of 20
4306737	96-Well Optical Reaction Plate with Barcode	1 box of 20
4306286	Archive Covers	1 box of 10
4306377	Conductive Pipette Tips, 1000-µL	1 box of 24 racks
4306375	Conductive Pipette Tips, 200-µL	2 boxes of 24 racks
4305936	Microcentrifuge Tubes and Caps, 2-mL	1 box of 500
4312639	Optical Cover Compression Pads	1 kit with 5 pads
4307726	Optical Heat Seal Covers	1 box of 100
4304831	Reagent Reservoirs, 120-mL	1 box of 32
4305932	Reagent Tubes with Caps, 10-mL	1 box of 40
4305673	Total RNA Purification Trays	1 box of 10

**Plastic Consumables
for the 384 Well
Output Block**

The following plastic consumables are included in the 6700, 384 Well Upgrade Kit. These supplies are completely consumed during the installation and initial testing of the instrument. Please verify that all of these items are present. The plastic consumables will be used on the ABI PRISM® 7900HT Sequence Detection System.

P/N	Description	Quantity
4309849	384-Well Optical Reaction Plate with Barcode	1 box of 50
4306375	Conductive Pipette Tips, 200-µL	1 boxes of 24 racks
4305932	Reagent Tubes with Caps, 10-mL	1 box of 40

**Packing Kit for the
96 Well Output
Block**

The following items are shipped in the 6700 Packing Kit (P/N 43078886A) for the 96 well output block. Please verify that all of these items are present.

P/N	Description	Quantity
4313100	Barcode reader, QS 6000 with cable	1
4315743	Cable, ethernet crossover with ferrites	1
4315744	Cable kit, ferrite for AC power cable	1
4313545	Cable, ethernet category-5 25-ft. RJ45-RJ45	2
4314492	Cable, serial DB9 M-F 3M	1
4315747	Checklist, packing kit	1
4310639	Coupling, insert 0.25-in. straight x 0.25-in. barb	4
4315293	Ferrite, 0.5-in. cable clamp 110 OHM@25 MHz	2
4316180	Fuse, 10A 250 Vac Fast 3AG 1.25 x 0.25	4
4313546	Kit, cable PC/Server Switch	2
4308550	Lamp cover	2
4309151	Lamp, fluorescent 32W 4-pin	2
100383	Mouse pad	1
901522	Postcard	1
4315748	Procedure, packing kit	1
4313543	Switch, Belkin KVM, PC/Server, 2 channel	1
4315378	Tool, white teflon tip tightener	5
225044	Tubing, vinyl, 0.25-in. internal diameter, 0.375 in. outside diameter	~25 ft

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 representative is at your facility. This person should know all of the safety procedures for the laboratory and know the locations of all of 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 (Halon)
 - ◆ 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 6700 Automated Nucleic Acid Workstation components have the following dimensions:

Component	Width	Depth	Height	Total Weight
Instrument	142 cm (56 in.)	84 cm (33 in.)	99 cm (39 in.)	159 kg (350 lb)
Computer monitor	43 cm (17 in.)	42 cm (16.5 in.)	44 cm (17.2 in.)	22 kg (49 lb)
Database Client CPU	45 cm (18 in.)	45 cm (18 in.)	21 cm (8.5 in.)	16.6 kg (37 lbs)
Mouse and keyboard	53 cm (21 in.)	18 cm (7 in.)	4 cm (1.5 in.)	1 kg (2 lb)
Database Server CPU	17 cm (6.5 in.)	42 cm (16.5 in.)	44 cm (17.2 in.)	16.6 kg (37 lbs)
Printer and/or tape back-up	Varies, Customer-supplied			

Note Dimensions and weights are subject to minor changes.

Instrument Storage Area An area of at least 175.3 cm x 114.3 cm x 161.3 cm (69 in. x 45 in. x 63.5 in.) must be allocated at the receiving and storage area for the crated 6700 instrument. Third-party movers will unpack the instrument and position it on the laboratory bench or table.

Laboratory Bench or Table The instrument requires a movable laboratory bench or table with sturdy casters. The bench must be able to accommodate the size and weight of the system. All four sides of the instrument must be accessible to the installer. Although the waste lines exit at the back of the instrument, the waste bottles should be placed under or in front of the laboratory table for easy accessibility.

Applied Biosystems recommends the Heicks Flat Bench¹, or a similar model, with the following specifications:

- ◆ 72-in. width x 30-in. depth x 34-in. height
- ◆ 4-in. swivel/lock casters
- ◆ 18-in. deep lower shelf
- ◆ Standard laminate top
- ◆ Standard power coat paint
- ◆ T-mold edge
- ◆ Optional 8-outlet power strip

Note Depending on the height of the majority of the users, you may choose another table height, or choose an adjustable height table. The deckspace is 24 cm (9.5 in.) from the tabletop, and the total distance from the front of the deckspace to the back is 53 cm (21 in.).

1. Heicks Flat Bench can be ordered from The Corner Office, 1045 Sansome Street, Suite 100, San Francisco, CA, 94111. Phone: 415-362-5595/Fax: 415-362-5599.

Computer Cart or Table

The computer, keyboard, and optional tape back-up and printer must be located to the left of the 6700 instrument, preferably on a sturdy, multi-level cart. This allows the computer monitor and keyboard to be situated near the instrument for easy operator access during run setup.

Applied Biosystems recommends the Heicks Test Station Tech Table², or a similar model, with the following specifications:

- ◆ 36-in. width x 30-in. depth x 34 -in. height
- ◆ Adjustable 15-in. x 12-in. single post-mounted shelf
- ◆ Drop-in riser shelf
- ◆ 6-outlet power strip with 15-ft power cord
- ◆ ESD main worksurface
- ◆ ESD grounding kit
- ◆ Storage cabinet with adjustable shelf
- ◆ Pull-out keyboard tray
- ◆ 20-in. x 18-in. lower shelf
- ◆ 4-in. total lock casters
- ◆ Optional 2-pocket binder storage
- ◆ Storage cabinet with adjustable shelf

Location of Database Client CPU

The Database Client CPU must be located within:

- ◆ 1.25 m (4 ft) of the switchbox, monitor, keyboard, and mouse

Note The monitor may be stacked on top of the Database Client CPU.

- ◆ 3 m (10 ft) of the 6700 instrument
- ◆ 1.25 m (4 ft) of the Database server tower
- ◆ 2 m (6 ft) of the printer (optional)

Location of the Computer Monitor and Keyboard

The computer monitor and keyboard should be situated to allow for proper ergonomics during use. The following guidelines are recommended:

- ◆ Benchspace (or pull-out tray) provided so that the keyboard is positioned directly in line with the monitor
 - ◆ Open space under the keyboard so that the operator can sit comfortably, directly facing the monitor
 - ◆ Workspace provided next to the monitor
-
-

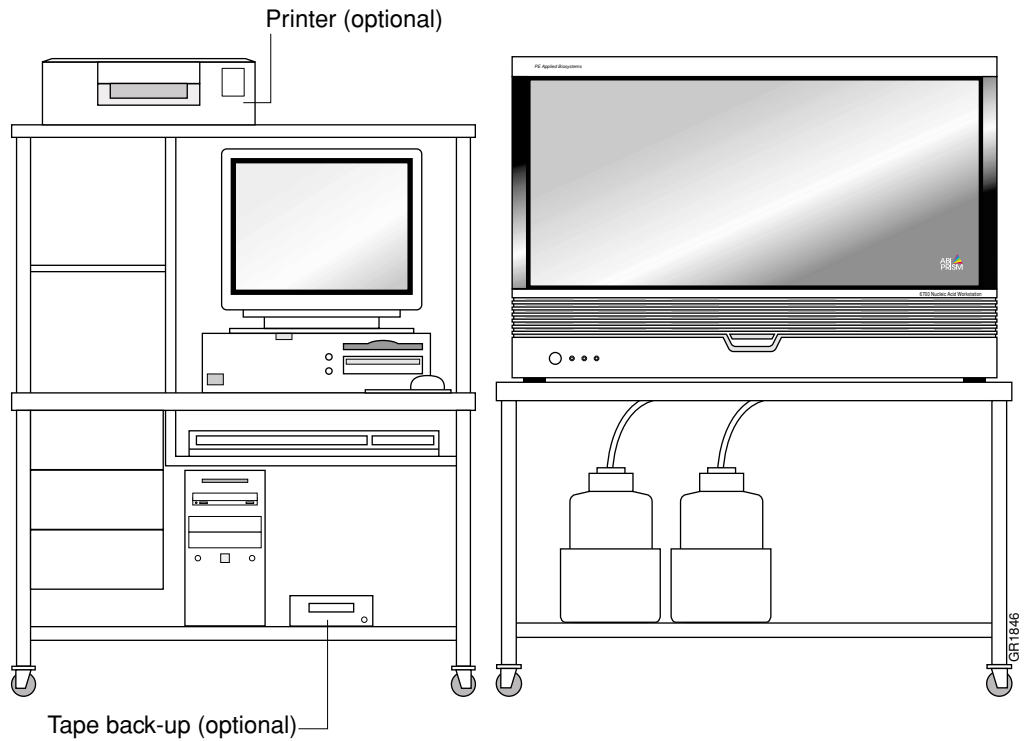
2. Heicks Test Station Tech Table can be ordered from The Corner Office, 1045 Sansome Street, Suite 100, San Francisco, CA, 94111. Phone: 415-362-5595/Fax: 415-362-5599.

Clearance A total vertical clearance of 153 cm (60 in.) is required for adequate ventilation and for servicing. The instrument will not be installed without this clearance.

A clearance of 15 cm (6 in.) is needed at the rear of the instrument to provide adequate ventilation. Additional clearance is required for servicing. Do not block access to the rear of the instrument.

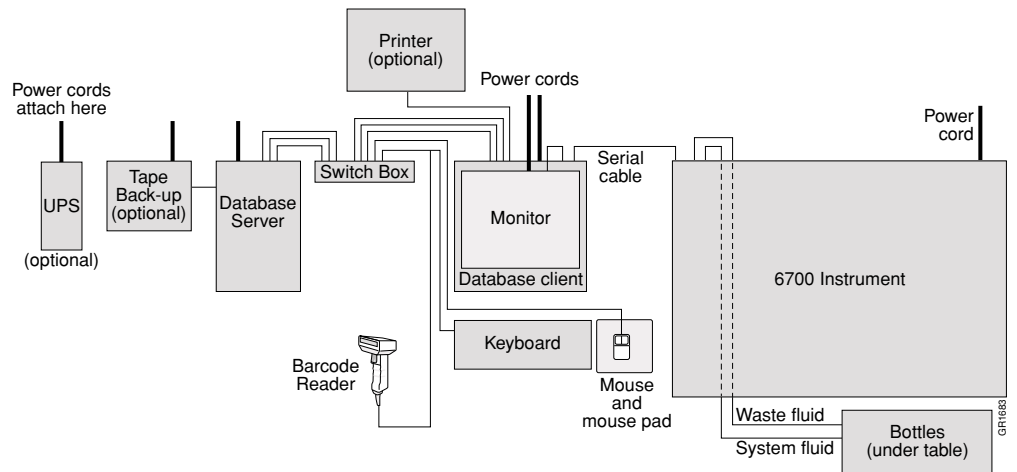
Typical Laboratory Layout

This graphic shows the front view of a typical laboratory layout.



Cable Connections

This graphic shows the appropriate cable connections for the 6700 instrument and accessory equipment.



Laboratory Ventilation Requirements

Venting This instrument produces no gaseous waste. It does not require installation under a fume hood. Always comply with all applicable local, state/provincial, or national laws and regulations and practices for venting waste.

Note The instrument has the capability to be connected to a plenum to direct the venting of the heated air.

Heat Production The thermal output of the instrument is 2730 Btu/h (~0.8 kW). 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 between 15 and 30 °C (59–85 °F). The instrument can tolerate up 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 non-conductive 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	220 \pm 10% 100 \pm 10%	50/60 Hz \pm 1%	3.6 8.0
USA/Canada	120 \pm 10%	50/60 Hz \pm 1%	6.6
Europe (pre-1992)	220 \pm 10%	50/60 Hz \pm 1%	3.6
EC	230 \pm 10%	50/60 Hz \pm 1%	3.4
UK (pre-1992)	240 +6%/-10%	50/60 Hz \pm 1%	3.3
Australia	240 +6%/-10%	50/60 Hz \pm 1%	3.3

Power Line It is strongly recommended that the instrument have a dedicated power line and ground or a power line with an uninterruptible power supply (UPS). Applied Biosystems recommends the Smart UPS Series SU1400 NET manufactured by Applied Power Conversion (APC).

Electrical Outlets This instrument requires a 3-prong, grounded receptacle in the United States. The electrical receptacle must be located within 2.5 m (8 ft) of the instrument rear panel. Do not use extension cords.

Power Rating This instrument is rated for a maximum draw (output) of 800 W.

Grounding Certain types of electrical noise are greatly exaggerated by poor or improper electrical ground connections. To prevent these problems, it is strongly recommended that there be a dedicated line and ground between the instrument and building main electrical service.

Power Cords In the USA, Canada, and Japan, the instrument is supplied with a detachable cord equipped with a standard 3-prong plug. In Europe and Australia, the instrument is supplied with an detachable electrical cord equipped with a standard EC plug. The computer can be plugged into any standard electrical receptacle after it has been configured for the proper voltage.

Voltage Quality Line voltage must be within $\pm 10\%$ of the nominal value. High or low voltages may have adverse effects on the electronic components of the instrument. In areas where the supplied power is subject to fluctuations exceeding these limits, a power line regulator may be required.

Power Line Regulator In areas where the supplied power is subject to voltage fluctuations exceeding $\pm 10\%$ of the nominal value, 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 1400 W 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 an uninterruptible power supply (UPS) with a capacity of 1400 W.

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

About This Chapter This chapter contains general information about handling hazardous chemicals and waste. It also contains information for the ABI PRISM™ 6700 Automated Nucleic Acid Workstation about Material Safety Data Sheets (MSDS).

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 any local, state/provincial, or national regulations.

In This Chapter This chapter contains the following topics:

Topic	See Page
Material Safety Data Sheet Information	3-2
Hazardous Chemicals and Biological Materials	3-3
Hazardous Waste	3-5

Material Safety Data Sheet Information

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 1-6 for details.

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

Hazardous Chemicals and Biological Materials

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 can 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.

**Handling
Biohazardous
Material**

Customers may choose to use this instrument to process materials, such as tissues, cells, or blood, that might be biohazardous. The 6700 contains a self-enclosed fume hood that meets Biosafety Level 2 specifications. For proper use of the instrument, the outer door must be locked in the down position.

▲ WARNING BIOHAZARD. Biological samples such as tissues and blood have the potential to transmit infectious diseases. Follow the U.S. Department of Health and Human Services guidelines¹ and the guidelines found in Occupational Safety and Health Standards, Toxic and Hazardous Substances² concerning the principles of risk assessment, biological containment, and safe laboratory practices for activities involving clinical specimens. You can obtain additional information by connecting to the government Web site (<http://www.cdc.gov>).

- ◆ All lab personnel who handle biohazardous materials must have received biohazards safety training.
 - ◆ All personnel must have the appropriate personal protection equipment (PPE).
 - ◆ Always operate the instrument with the fume hood on.
 - ◆ The instrument waste should be treated as biohazardous.
-

1. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, and National Institutes of Health. 1999. *Biosafety in Microbiological and Biomedical Laboratories*, 4th ed. Richmond, J.Y. and McKinney, R.W., eds. Washington, DC: U.S. Government Printing Office. For sale by the Superintendent of Documents, U.S. Government Printing Office. Stock no. 017-040-00547-4.

2. U.S. Department of Health and Human Services Occupational Safety and Health Administration. 1998. Occupational Safety and Health Standards, Toxic and Hazardous Substances: Bloodborne pathogens. 29 CFR §1910.1030.

Hazardous Waste

Overview This instrument may generate hazardous waste. Follow these guidelines for hazardous waste:

⚠ 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.
- ◆ Venting hazardous waste may require local, state/provincial, or national air permits.
- ◆ Minimize contact with and inhalation of chemical waste. Wear appropriate personal protective equipment when handling chemicals (*e.g.*, safety glasses, gloves, or clothing).
- ◆ Handle chemical wastes in a fume hood.
- ◆ 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.
- ◆ After emptying the waste container, seal it with the cap provided.

Instrument Waste System The waste for this instrument is collected in a 4-L (1-gallon) plastic container. Dispose of the waste when the waste bottle is half full.

Fluid wastes are flushed through the vacuum station to the waste bottle. HEPA filters protect the system from aerosol contamination.

System fluid is isolated and recycled through the instrument but should be changed regularly to avoid bacterial contamination. If the system fluid is changed regularly, it is not considered hazardous material.

The composition of the chemical waste may vary depending upon the protocols used, the number of samples, the volumes specified, and the reagents included in the protocols.

-
- Handling Chemical Waste** When handling chemical waste Applied Biosystems strongly recommends that you:
- ◆ Read the waste profile(s) in this chapter before handling or disposing of hazardous waste.
 - ◆ 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

About 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™ 6700 Automated Nucleic Acid Workstation. The safety labels and safety alert symbols that may be found on this instrument are provided in several languages. The inputs and outputs of the instrument are also provided.

In This Chapter This chapter contains the following topics:

Topic	See Page
Instrument Operation	4-2
Instrument Labeling	4-2
Safety Alert Symbols	4-4
Input/Output Connections	4-14

Instrument Operation

Safe Operation This guide provides only site preparation information. Before operating this instrument, read the information in the *ABI PRISM 6700 Automated Nucleic Acid Workstation User's Manual* concerning hazards and potential hazards. Ensure that anyone involved with the operation of the instrument is instructed in both general safety practices for laboratories and specific safety practices for the instrument.

Detailed safety information topics that will be covered in the user's manual for this instrument include:

- ◆ Electrical safety
 - ◆ Lamp safety
 - ◆ Pressurized bottle safety
 - ◆ Robotic arm 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), a Applied Biosystems service representative should inspect the instrument.

We recommend that a Applied Biosystems service engineer 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 label consists of a Signal Word panel and a Message panel. A Safety Alert symbol indicates a potential personal safety hazard. If multiple hazards exist, the signal word corresponding to the greatest hazard is used.

- 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)
-










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:



English	French
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ンドに接続できることを示します。これはグラ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 경고 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 แสดงว่ามีขั้วต่อลงดินเพื่อความปลอดภัยอยู่นั้นที่หนึ่งที่ต้องเชื่อมต่อกับสายลงดินก่อนที่จะสามารถทำการต่อไฟอื่นใดกับเครื่องวัดนี้ได้
	ขั้วต่อที่ติดเครื่องหมายนี้ ได้รับหรือส่งกระแสหรือแรงดันสลับ
	ขั้วต่อที่ติดเครื่องหมายนี้ สามารถรับหรือจ่ายกระแสหรือแรงดันไฟฟ้าทั้งกระแสสลับและกระแสตรงได้
	เครื่องหมายนี้แสดงว่ามีกระแสแรงดันสูง และเตือนผู้ใช้เครื่องว่า จะต้องทำงานด้วยความระมัดระวัง
	เครื่องหมายนี้มีไว้เพื่อเตือนผู้ใช้เครื่องว่า จะต้องดูรายละเอียดเพิ่มเติมในคู่มือแล้วทำงานด้วยความระมัดระวัง

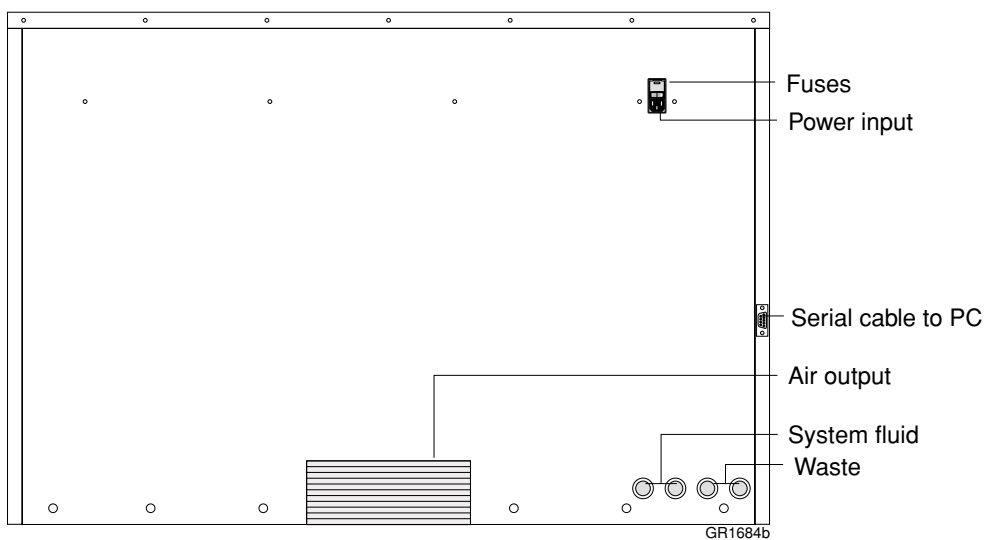
เครื่องหมายที่ไม่เกี่ยวข้องกับไฟฟ้า

ข้อความต่อไปนี้ เขียนไว้เพื่ออธิบายความหมายของเครื่องหมายเตือนอันตรายต่างๆ ที่ไม่เกี่ยวข้องกับไฟฟ้า และปรากฏบนเครื่องวัดชนิดต่างๆ ของ Applied Biosystems

	เครื่องหมายนี้ แสดงภาวะอันตรายที่เกิดจากเครื่องทำความร้อน จงใช้ความระมัดระวังในขณะที่ทำงานในบริเวณเหล่านี้ เพื่อหลีกเลี่ยงไม่ให้อุณหภูมิสูงขึ้นส่วนใด ๆ ที่ร้อนจัด
	เครื่องหมายนี้ แสดงว่ามีเลเซอร์อยู่ในเครื่องวัดนี้

Input/Output Connections

Location The locations of the input/output connections on the ABI PRISM™ 6700 Automated Nucleic Acid Workstation are shown in the figure below. The input/output connections are also labeled on the instrument.



Acronyms and Abbreviations



Acronyms and Abbreviations Used in MSDSs

Introduction MSDSs use acronyms and abbreviations for certain organizations, government regulations, common scientific terminology, units of measurement, and chemicals. 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:

Term	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 _{LO}	Lowest published lethal concentration
LC ₅₀	Lethal concentration in air that kills 50% of a specified population
LD ₅₀	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

Term	Explanation
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 _{LO}	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:

Abbreviation	Unit of Measure
#	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
P/N	part number
psi	pounds per square inch
sec	second
V	volt
VA	voltampere
VAC	volts, alternating current
W	watt

Chemicals The following table lists abbreviations for common chemicals.

Abbreviation	Definition
A	adenine
AA	amino acid
1Ac	acetyl
AcI	acetylimidazole
Acm	acetamidomethyl
Ac ₂ O	acetic anhydride
ACN	acetonitrile
ACT	activator vessel
BHA resin	benzhydramine resin
t-BOC	tert-butyloxycarbonyl
Bzl	benzyl
Br-Z	2-bromobenzyloxycarbonyl
t-Bu	tert-butyl
C	cytosine
CHO	formyl
CH ₃ Bzl	4-methylbenzyl
CH ₃ O Bzl	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-fluorenylmethoxycarbonyl
G	guanine
HBTU	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
mBHA resin	4-methylbenzhydramine 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
OBt	ethyl ester
OMe	methyl ester
PAM resin	phenylacetamidomethyl resin
PEG	polyethylene glycol
RV	reaction vessel
SSPS	solid-phase peptide synthesis
T	thymine
TETD	tetraethylthiuram disulfide
TFA	trifluoroacetic acid
TFMSA	trifluoromethane sulfonic acid
THF	tetrahydrofuran
Tos	4-toluenesulfonyl (tosyl)
Tri	trityl
U	uracil
Z	benzyloxycarbonyl

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

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