



PlatePierce® User Guide

April 2005

Diagnostics version 4.x

Copyright 2005 Velocity11

The information provided in this guide is intended to be accurate and reliable. However, Velocity11 does not assume responsibility for its use or for any infringements upon the rights of third parties that may result from its use.

The transfer of this guide, in any manner or form, to a representative of another company is strictly forbidden.

PlatePierce and Velocity11 are registered trademarks of Velocity11.

VWorks is a trademark of Velocity11.

Microsoft and Windows are registered trademarks of the Microsoft Corporation in the United States and other countries.

All other trademarks are the sole property of their respective owners.

Velocity11
3565 Haven Avenue
Menlo Park CA 94025
USA

Phone: 650-846-6600
Fax: 650-846-6620
Service: 1-800-979-4811
Sales: 1-866-428-9811
Email: info@velocity11.com
<http://www.velocity11.com>

Contents

Using the PlatePierce	1
Who this guide is for	2
About Velocity11 user guides	3
Reporting problems	6
Safety information	7
Hardware overview	8
PlatePierce control overview	10
Unpacking the PlatePierce	12
PlatePierce requirements	13
Basic set up	14
Adding a support insert	15
Changing the pin plate	17
Disconnecting the air tubing	19
Running in stand-alone mode	20
Optimizing piercing	22
Connecting to a lab automation system	23
Using PlatePierce Diagnostics software	24
Turning off the PlatePierce	27
ActiveX commands	28
Maintenance and troubleshooting	32
Actions reference	33
Index	37

Using the PlatePierce

The PlatePierce® prepares sealed microplates for automated processing by piercing the seal. Piercing is required to allow pipette tips to access the samples after a plate has been sealed.

This guide describes the PlatePierce, shows you how to set it up, and gives procedures for operating it. It also provides the information you need to stay safe when operating it.

Who this guide is for

Intended audience This guide is for anyone who integrates, installs or uses the PlatePierce.

Supported software version This version of the *PlatePierce User Guide* supports PlatePierce Diagnostics software version 4.x. You can find the version number in the title bar of the PlatePierce Diagnostics software.

If you plan to use your PlatePierce as a stand-alone instrument, without controlling it with a computer, you do not need to install the software.

Other user guides to read If your PlatePierce is installed on a Velocity11[®] BioCel[®], read this guide in combination with the *BioCel User Guide*.

If your PlatePierce is installed on another company's lab automation system, read this guide in combination with the documentation that is available for the system.

About Velocity11 user guides

Introduction

Each Velocity11 user guide is delivered to you as:

- An online help file
- A PDF file
- A printed book

The information in each format is the same but each has different strengths. To work most effectively it will help to know when it is best to use each format.

Where to find the online help and PDF files

The online help and PDF files are included on the PlatePierce software CD-ROM, as files that you need to copy onto your computer. They are not automatically installed with the software.

You can also download them from our Web site at www.velocity11.com/support/support.html.

Online help

The online help is the best format to use when you are working at the computer and when you want to perform fast or advanced searches for information. It is also the only format in color.

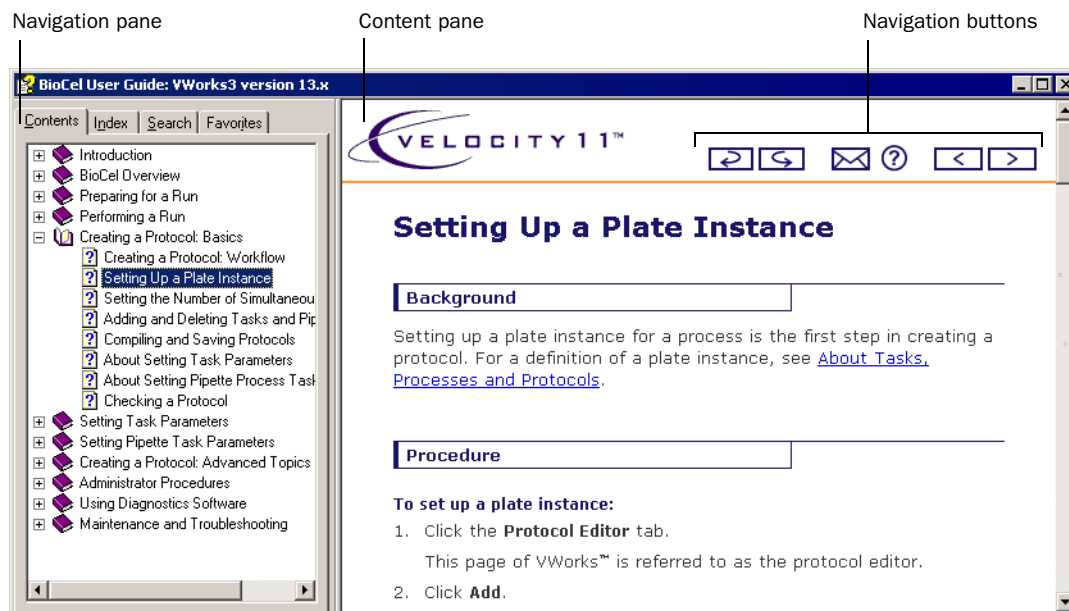
To open the online help:

1. If you are currently using Velocity11 software, check the status bar to see if it says "Click F1 for Help", and if so, push the F1 key on your keyboard.
2. If you are not using our software, or the F1 option is not available, locate the *PlatePierce<publication_date>.chm* file and double-click it.

Note: For quick access to the help, create a shortcut to the .chm file on your desktop.

Main features

The online help viewer includes a navigation pane, content pane and navigation buttons.



The navigation pane has four tabs, providing four different ways to locate information.

The content pane displays the online help topics.

Navigation buttons in the content pane allow you to navigate through the pages. Click the question mark button for more information.

Filename

The PlatePierce online help user guide is a single file named PlatePierceUserGuide_<publication_date>.chm. You can open it by double-clicking the file.

Computer requirements

You can copy the online help file to any computer, but to open it requires a Microsoft Windows operating system and Microsoft Internet Explorer version 4 or greater.

PDF user guide

File names

The PlatePierce user guide in PDF format is a file named PlatePierceUserGuide_<publication_date>.pdf.

Computer requirements

To open the user guide in PDF format, you need an Acrobat viewer. You can either use the viewer that is built into Adobe Acrobat, or you can download the free Adobe Reader application from <http://www.adobe.com/support/downloads/main.html>.

We provide user guides in PDF format for printing additional copies. You can also use them for simple searches using the Find button, although these searches are much slower than online help searches:



For more information about using PDF documents, see the Adobe Acrobat PDF help system that can be accessed from your Acrobat viewer.

To open the PDF help system:

1. With the PDF file open, select **Help > Acrobat Help**.
-

Reporting problems

Reporting software errors

If you find an error in the Velocity11 software, or are unable to solve a technical problem, please let us know by sending an email to service@velocity11.com.

Reporting user guide errors

If you find an error in this user guide, or have any suggestions for improvement, please let us know. Your comments will be reviewed promptly and used to write the next version of the guide.

It only takes a minute or two to provide feedback using the feedback button in the online help.



You can also send an email directly to documentation@velocity11.com.

Safety information

Introduction This topic gives general information about PlatePierce safety hazards.

Before using Before using a PlatePierce, your organization should make sure that you are properly trained in:

- General laboratory safety
- The correct and safe operation of the PlatePierce
- The correct and safe operation of other lab automation systems or components used in combination with the PlatePierce

If you are the person in your organization responsible for training others on the PlatePierce and you have a safety question, please take the time to ask us.

Safety labels Pay attention to safety labels printed on your product. A safety label consists of a warning symbol, a description of the warning, and information that will help you to avoid the safety hazard.

An example safety label is shown here:



Chemical hazards Some chemicals used when working with the PlatePierce may be hazardous. Make sure that you follow the recommendations in the MSDS (Material Safety Data Sheet) for every chemical that you plan to use. The manufacturer of the chemical should provide you with the MSDS.

Waste disposal Remember to dispose of chemicals in accordance with local, state and federal regulations.

Product use Velocity11's products must only be used in the manner in which we intend, as described in our user guides. Any other use may damage the product or injure you. Velocity11 is not responsible for damages caused, in whole or part, by unauthorized modifications, or by procedures that are not explicitly described in our user guides. Any modifications or changes to products not expressly approved in Velocity11 user guides could void the warranty.

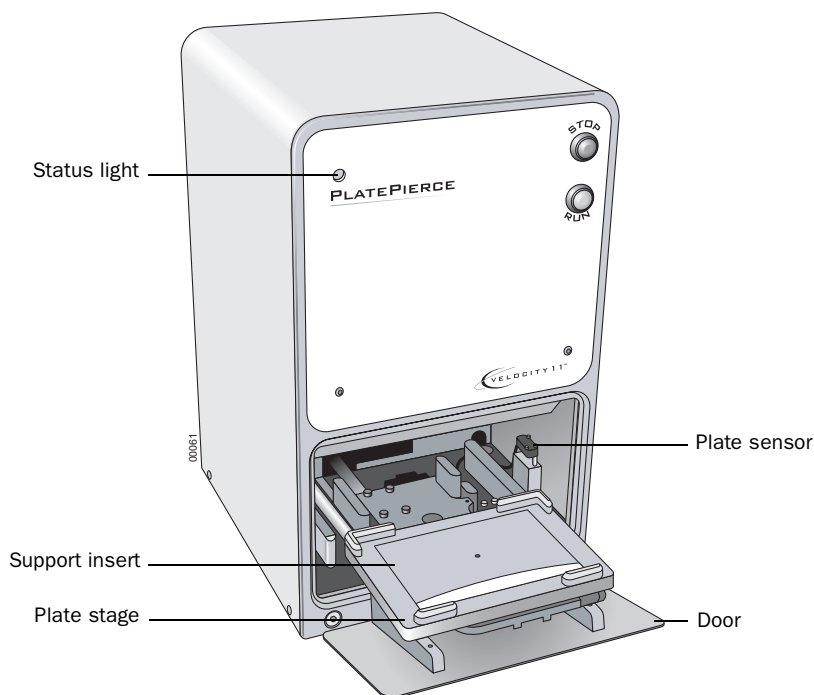
Hardware overview

Introduction

This topic introduces the PlatePierce hardware and its accessories.

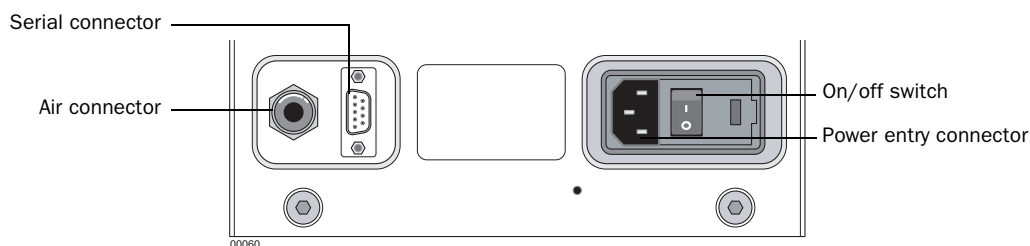
Front features

The following diagram shows the front features of the PlatePierce with its plate stage extended.



Connection panel

The following diagram shows the features of the connection panel at the rear of the PlatePierce.



Status light

The light on the front of the PlatePierce indicates the status of the instrument.

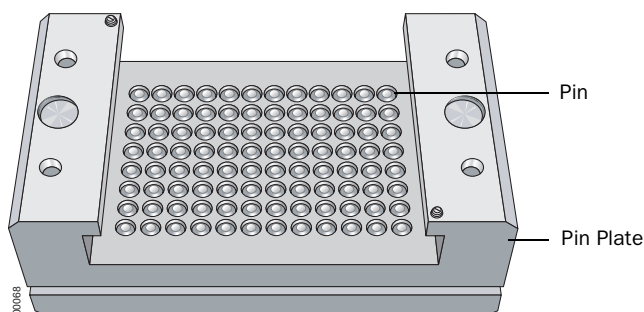
Color	Status
Red	Stopping a piercing operation.
Orange	Performing a piercing operation.

Color	Status
Blinking orange	Plate not positioned correctly on the plate stage. Piercing operation aborted.
Blinking red	Insufficient air pressure to pierce a plate seal.
Blinking green	Either: <ul style="list-style-type: none"> <input type="checkbox"/> Power is turned on but the Run button has not been pushed to initialize the PlatePierce. <input type="checkbox"/> Time-out occurred during a piercing operation, meaning that the operation could not be completed for some reason.
Solid green	Ready to run.

Pin plate

The pin plate contains the pins that pierce the seal. It moves up and down to perform the piercing action.

The following diagram shows a pin plate from above.



Types of pin plate

There are two types of pin plate:

- 384-well, used to pierce 384-well plates
- 96-well, used to pierce 96-well plates

To replace a pin plate, see “Changing the pin plate” on page 17.

Types of piercing pins

There are two types of piercing pins:

- 384-format, for use in the 384-well pin plate
- 96-format, for use in the 96-well pin plate

You can order new piercing pins if they become worn or lost.

PlatePierce control overview

PlatePierce control options

You can control the PlatePierce using:

- The protocol software of a lab automation system.

If you are using a Velocity11 BioCel, the protocol software is VWorks™.

If you are running the PlatePierce in a system developed by your own organization, the protocol software will have been custom-written using a program such as C++ or Visual Basic.

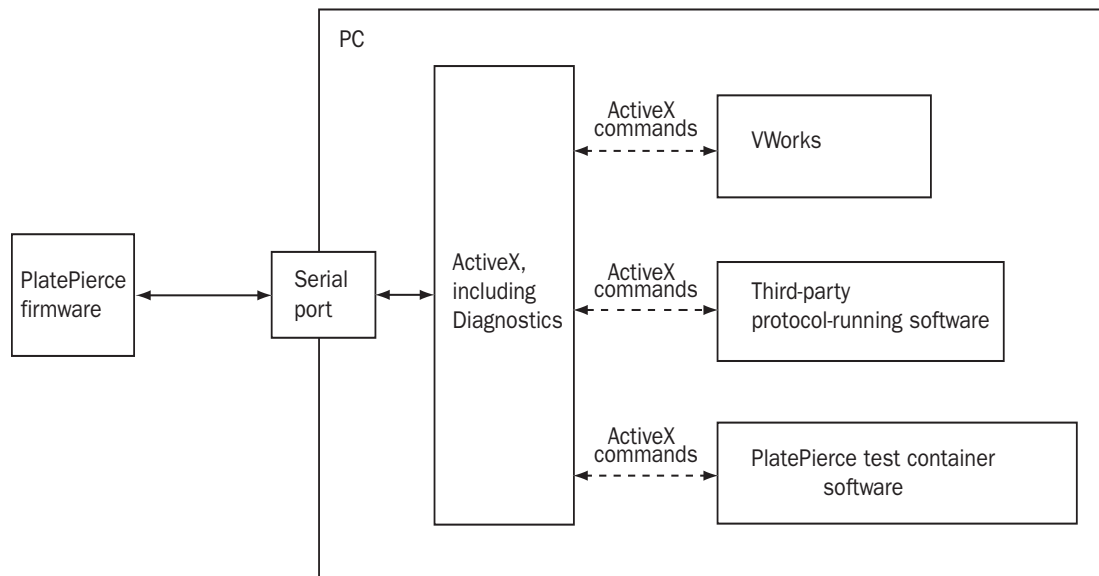
- ActiveX test container software provided by Velocity11 to allow you to open PlatePierce Diagnostics software and issue individual commands executed in real time.

Test container software is often used by lab automation integrators during their preparation for integration into a third-party automation platform.

- The manual hardware controls.

Software control

The following diagram shows the options for controlling a PlatePierce from a computer.



ActiveX software

ActiveX is a set of Microsoft® Windows®-based technologies that allows software components to interact with each other regardless of the programming language in which the components were created. Using the PlatePierce ActiveX, simple commands can initiate complex operations in a networked PlatePierce.

The PlatePierce ActiveX software includes:

- PlatePierce Diagnostics software

- Methods, which control individual operations
- Properties, which set the values used in methods, such as Blocking=TRUE
- Events, which are notifications that methods are complete or have errors

To allow you to develop your own controlling software, the topic “ActiveX commands” on page 28 provides the ActiveX methods, events and properties.

PlatePierce Diagnostics

PlatePierce Diagnostics is a dialog box that is part of the ActiveX software. From the PlatePierce Diagnostics dialog box, you can monitor measured pressures and initiate a piercing operation.

For more information, see “Using PlatePierce Diagnostics software” on page 24.

Unpacking the PlatePierce

Parts inspection

As you unpack the PlatePierce, inspect all of the parts. If anything is missing or appears to be damaged, contact the Velocity11 Service Center as soon as possible.

!! DAMAGE HAZARD !! Save the box, foam end-caps, foam hoop, and foam insert in case you ever need to ship the PlatePierce back to Velocity11. If you ship the PlatePierce without the foam insert that is inside it, the piercing pins may fall out in transit.

Note: Velocity11 is not responsible for damage if the PlatePierce is incorrectly packaged and moved by someone other than a Velocity11 employee.

Basic package

The basic PlatePierce package contains:

- A PlatePierce
 - Either a:
 - ◆ PlatePierce 96-well pin plate
 - ◆ PlatePierce 384-well pin plate
-

Accessories kit for North America

The accessories kit for North America contains:

- A North America fittings kit
 - Tubing, ¼-inch, 15-feet, for supplying air
 - A power cord for use in North America
 - A serial cable
 - A *PlatePierce User Guide*
 - A PlatePierce Software and User Guide CD-ROM
-

Accessories kit for Europe

The accessories kit for Europe contains:

- A metric fittings kit
 - Tubing, 6-millimeters, 15-feet, for supplying air
 - One of the following:
 - ◆ Power cord, Swiss, detachable, IEC 320, 2.5 meters
 - ◆ Power cord, continental Europe, detachable, IEC 320, 2.5 meters
 - ◆ Power cord, United Kingdom, detachable, IEC 320, 2.5 meters
 - A serial cable
 - A *PlatePierce User Guide*
 - A PlatePierce Software and User Guide CD-ROM
-

PlatePierce requirements

Laboratory requirements

The PlatePierce has the following laboratory requirements:

Item	Requirement
Bench space	Length: 13.5 inches (34.3 cm) Width: 8.00 inches (20.3 cm) Height: 13.8 inches (35.1 cm)
Electrical supply	110–240 VAC, 50–60 Hz
Air supply	<2.0 cfm (0.94 L/s) at 75–80 psi (0.52–0.55 MPa)

Labware requirements

!! IMPORTANT !! All labware (including deepwell and PCR plates) used in the PlatePierce must conform to the SBS microplate standards. Please visit www.sbsonline.org for current SBS standards, or contact your labware's manufacturer.

Computer requirements

If you want to control your PlatePierce with a computer, it must meet the following minimum requirements:

- PC running Windows NT 4.0, 2000 or XP
 - Pentium 166 processor
 - 32 MB RAM
 - RS-232 serial port with DB 9 connector
-

Basic set up

Introduction

Before you can use the PlatePierce you must connect it to the power and air supplies.

Safety information

The PlatePierce can be in a state in which the pin plate is in the lowered position and an action can cause it to move upwards with considerable force, resulting in injury if your hand is inside the PlatePierce.

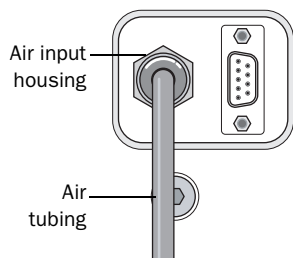
!! INJURY HAZARD !! Never put a hand inside the PlatePierce unless both the air and power supplies are turned off and disconnected.

Setting up

This procedure assumes that the door is closed at the start.

To set up a PlatePierce:

1. Place the PlatePierce on a sturdy lab bench free from obstructions. Make sure that you leave at least 6 inches (15 cm) of space in front of the PlatePierce.
2. Push the air tubing into the air input housing.



3. Test the installation by gently tugging the air tubing. If you feel resistance, the line has been properly installed.
4. Attach the power cord to the power entry connector and plug the other end into a power outlet.
5. Turn on the air supply to the PlatePierce.
6. Turn on the power at the on/off switch. The status light on the front of the PlatePierce blinks green.
7. Press the Run button. The pin plate moves up quickly, the door opens, and the status light turns to solid green.
8. Remove the foam insert used during shipping.

!! DAMAGE HAZARD !! Keep the insert in case you ever need to ship your PlatePierce.

Adding a support insert

Introduction

A support insert is used to fill the gap beneath a plate.

!! IMPORTANT !! Always use one of the supplied inserts.

Without an insert, a plate will bow inwards during piercing causing the seal over the central wells to remain unpierced.

Insert heights

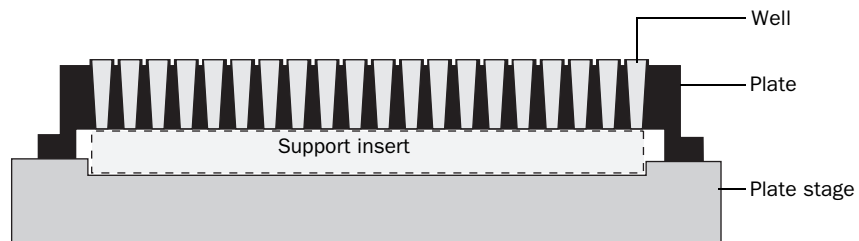
Different inserts are required because different plates have different skirt heights. The following inserts are provided with the PlatePierce:

Number on the Insert	Insert Height (inches)
180	0.180
235	0.235
290	0.290

Choosing a support insert

Select the thinnest insert that sufficiently supports the center of the plate. An insert that is too thick can cause a plate to break.

!! DAMAGE HAZARD !! Always test the piercing operation with an empty plate before starting a production run.

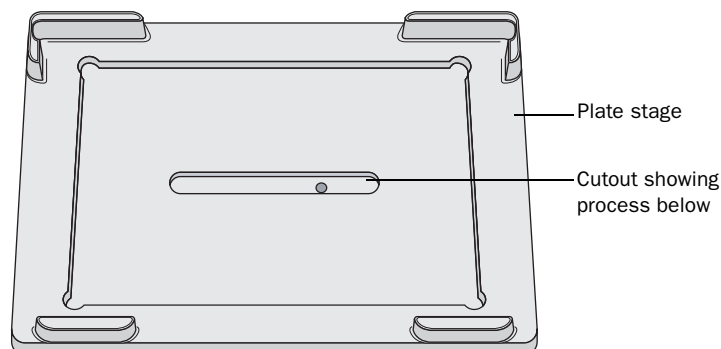


Procedure

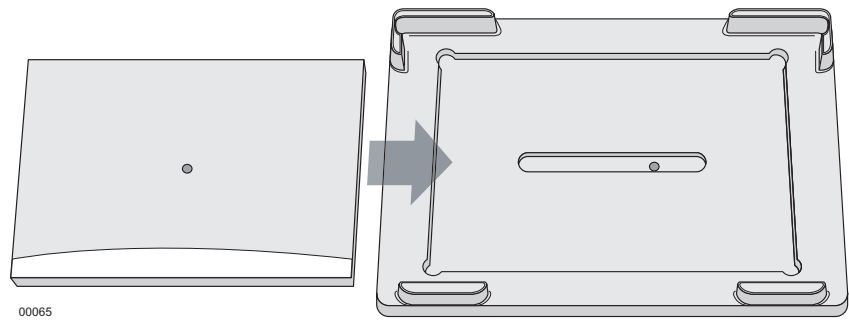
This topic explains how to use a support insert.

To add a support insert:

1. Make sure that the plate stage is placed so that the cutout fits onto the process on the base.



2. Place the support insert into the depression on the plate stage.



00065

Changing the pin plate

Introduction

If you want to pierce plates that have a different number of wells, you will need to change the pin plate.

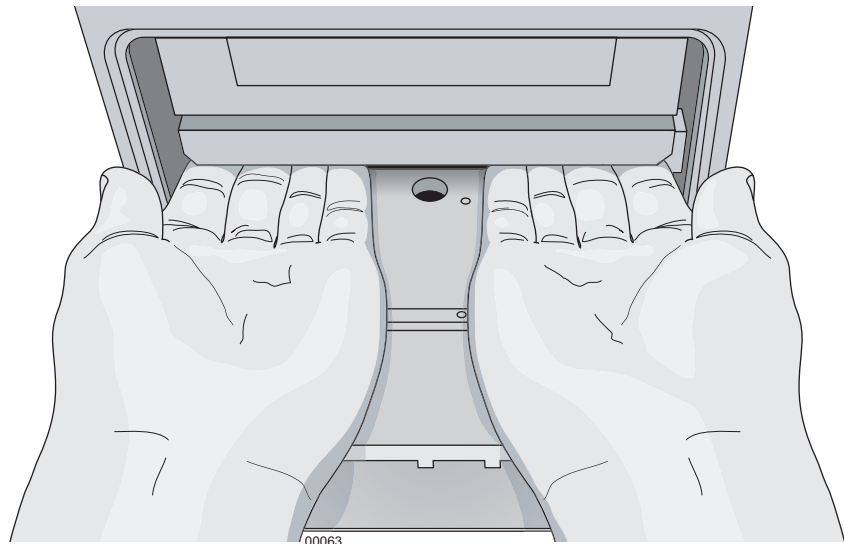
Procedure

To remove a pin plate:

1. With the door in the open position, turn off the air supply, equilibrate the air in the tubing with atmospheric pressure, and disconnect the air tubing following the directions in “Disconnecting the air tubing” on page 19.
2. Turn off the power at the power switch.
3. Unplug the power cord.

!! INJURY HAZARD !! You must unplug the power cord at this step to prevent the possibility of your fingers being crushed in the mechanism when changing the pin plate.

4. If the pin plate did not fall when the air supply was turned off, reach into the PlatePierce with one hand, curl your fingers around the back of the pin plate, and pull it down.
5. Remove the plate stage and place it on the bench.
6. If the pin plate is held in by a thumbscrew on the left side, remove the thumbscrew.
7. Hold the pin plate underneath with both hands as shown in the following diagram.



8. With your thumbs firmly on the sides of the PlatePierce, carefully ease the pin plate forward and out of the PlatePierce.

The pin plate may occasionally stick, even when exerting maximum pull. In this case, remove the side panel, reach to the back of the pin plate and pull it forward.

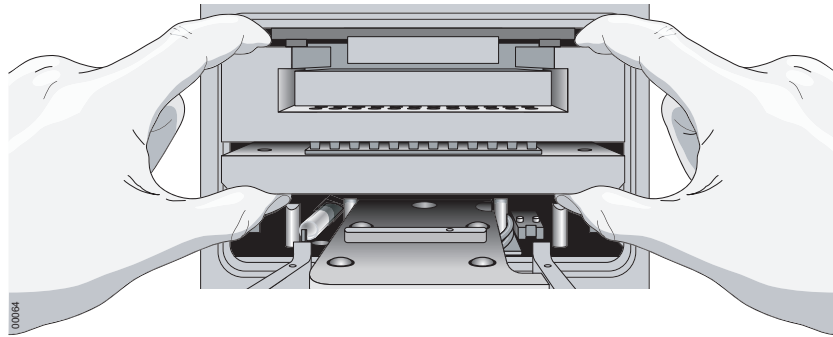
- Without turning it over, carefully place the pin plate down on the bench.

!! IMPORTANT !! If you turn the 96-pin pin plate over, the pins will fall out. (The 384-pin plate has a pin retainer to prevent this from happening.)

Inserting a pin plate

- Pick up the replacement pin plate, and carefully insert it into the PlatePierce.

!! DAMAGE HAZARD !! Make sure that you push the pin plate all the way in until it stops.



- If your PlatePierce has a thumbscrew that you removed earlier, replace it.
- Replace the plate stage.
- Turn on the air supply.
- Plug in the power cord.
- Turn on the power at the on/off switch.

The status light blinks green.

!! INJURY HAZARD !! Before the next step, make sure that your hands are not inside the PlatePierce.

- Press the Run button.

The pin plate moves up and the status light turns to solid green.

For more information about pin plates, see “Pin plate” on page 9.

Disconnecting the air tubing

Introduction

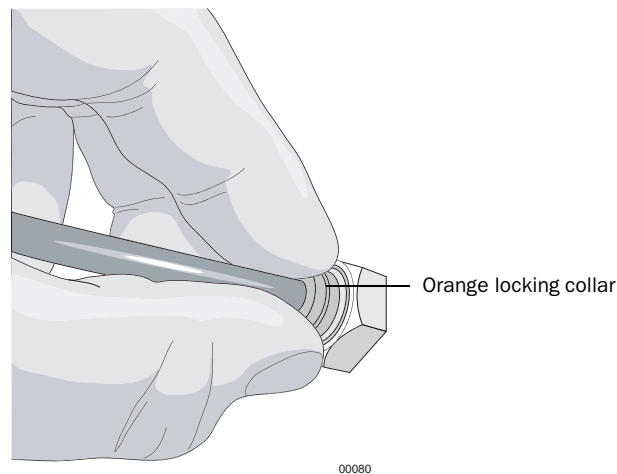
Before moving or shipping the PlatePierce you need to disconnect the air tubing. You may also need to do this before performing maintenance or cleaning. This topic explains how to disconnect the air tubing without damaging the air input port.

!! DAMAGE HAZARD !! Follow the directions in this topic to correctly disconnect the air tubing from the PlatePierce's air input port.

Procedure

To disconnect the air tubing:

1. Turn off the air source so that there is no air pressure to the PlatePierce.
2. Push in the orange locking collar on the quick-release fitting.



3. With your free hand, gently pull on the air tubing until it comes free.
-

Running in stand-alone mode

Piercing procedures Use these procedures when operating the PlatePierce as a stand-alone device (not integrated into a computer-controlled lab automation system).

The procedures assume that the PlatePierce has its air and power supplies turned on. For important information about preparing the PlatePierce, see “Basic set up” on page 14.

To pierce a plate seal:

1. Make sure that an appropriate support insert is on the plate stage.
For details, see “Adding a support insert” on page 15.
2. Place the plate on the plate stage.
3. Press the Run button.

The light turns orange, the plate stage is pulled into the PlatePierce and the door is closed. The plate seal is pierced, the door opens and the plate stage presents the plate.

If the plate is not correctly positioned on the stage, the light turns red, the door opens before the seal is pierced and the stage presents the plate.

To stop the PlatePierce:

1. At any time after pushing the Run button, push the Stop button.
The light turns red, the pin plate moves back up if it has moved, the door opens and the stage presents the plate.

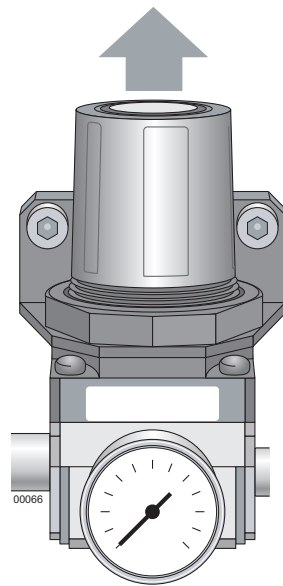
Changing the piercing pressure

To change the piercing pressure, when operating the PlatePierce in stand-alone mode, you have to remove the back and manually adjust the pressure regulators.

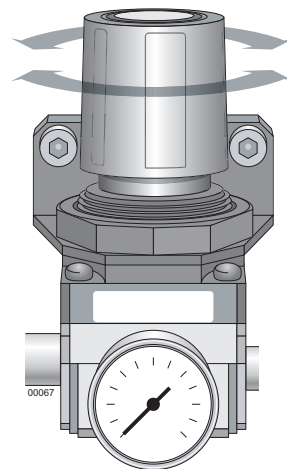
For advice on choosing a piercing pressure, see “Setting a piercing pressure” on page 22.

To adjust the piercing pressure:

1. Turn off the power at the power switch.
2. Unplug the PlatePierce.
!! INJURY HAZARD !! You must unplug the power cord before continuing with this procedure to prevent the possibility of electrical shock.
3. Remove the back panel by unscrewing the four allen bolts with a 2-mm allen wrench.
Unscrew the bottom screws first.
4. Lift up the regulator’s pressure adjustor knob, which may require significant force.



5. Turn the adjustor knob, watching the pressure on the dial increase or decrease, as required.



The arrow on the top of the knob indicates the direction in which to turn it.

6. Push the adjustor knob back down.
 7. Replace the back panel.
 8. Plug in the power cord.
 9. Turn on the power at the power switch.
-

Optimizing piercing

Using multiple layers In the laboratory, a plate is often sealed and pierced more than once. Each time, the effective diameter of the well decreases because the seal is folded into the well opening. At some point, as more layers of seal are added, the sides of the pin crush and scrape the seal as the pin enters the well. This tears off pieces of seal which drop into the well, interfering with pipetting.

Up to 10 layers of seal can be used on a 96-well plate. Because 384-well plates have much smaller wells, only two layers of seal can be used with them.

Each piercing operation can pierce one or two layers, so several piercing operations may be needed to pierce a plate.

Setting a piercing pressure

The default piercing pressure is 80 psi (0.55 MPa). If you are using fragile plates that are damaged at this pressure, reduce the piercing pressure to 75 psi (0.52 MPa).

Connecting to a lab automation system

Introduction

To use your PlatePierce as part of a lab automation system you will need to install the PlatePierce Diagnostics software and connect the PlatePierce to a computer.

Installing the software

To install the PlatePierce Diagnostics software:

1. Open the supplied software CD-ROM and double-click the file named PlatePierce Installer.exe.
2. Follow the directions in the installation wizard.

To connect the PlatePierce to a computer

To connect the PlatePierce to a computer:

1. Connect the female end of the serial cable to a COM port on the computer.

Note the number of the COM port to which you connect for later use.

2. Connect the male end of the serial cable to the serial port on the PlatePierce.

Make sure that the computer successfully communicates with the PlatePierce by following a test piercing operation, as described in “Using PlatePierce Diagnostics software” on page 24.

Using PlatePierce Diagnostics software

Introduction

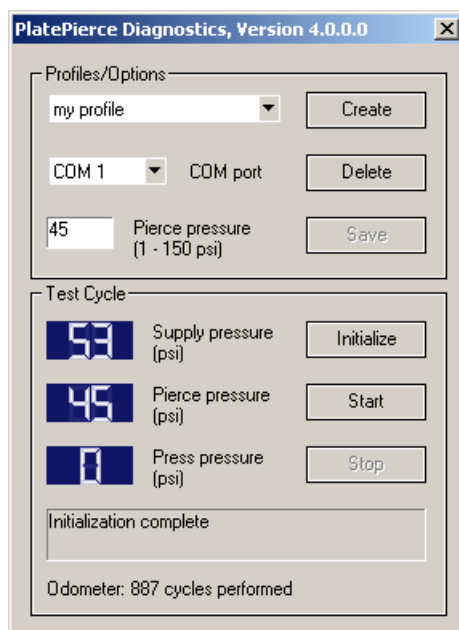
The PlatePierce Diagnostics software is used to control the PlatePierce when it is integrated into a lab-automation system.

Opening PlatePierce Diagnostics

To open PlatePierce Diagnostics:

1. In Windows, navigate to **Start > All Programs > Velocity11 > PlatePierce > PlatePierce Test Container**.

The **PlatePierce Diagnostics** dialog box opens.



Communicating with a PlatePierce

Before you can pierce plates using PlatePierce Diagnostics, you must initialize communication with the PlatePierce. This requires two steps:

- Selecting a PlatePierce to communicate with
- Initializing the communication

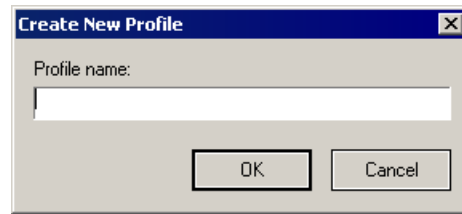
If you have more than one PlatePierce on your lab automation system, each must be controlled through its own COM port. To achieve this, you can either add more serial ports to your computer, or you can use a serial hub. Each PlatePierce is then assigned its own COM port.

You must create a profile for each PlatePierce on your system.

To create a profile:

1. In the PlatePierce Diagnostics window, click **Create**.

The **Create New Profile** dialog box opens.



2. Type a name for the profile and click **OK**.
3. From the **COM port** list box, select a COM port to associate with the new profile.

This comes from the COMM port you noted in “Connecting to a lab automation system” on page 23. If your computer has four COM ports, the list box will display four options.

4. Click **Save**.

Now, when this profile is selected, the associated COM port will be displayed in the **COM port** list box and will be the currently selected COM port.

To communicate with a PlatePierce:

1. Select a profile from the **Profiles/Options** list box.
2. Click **Initialize**.

The message **Initialization complete** is returned when the communication has been verified.

Piercing procedure

Use this procedure to with a lab automation system.

To pierce a plate seal:

1. Make sure that you are using a support insert as described in “Adding a support insert” on page 15.
2. Use the robot to place the plate on the plate stage.
3. Open the PlatePierce Diagnostics software.

The method for opening the software will depend on how it is integrated into your lab automation system.

4. Enter the piercing pressure that you want to use in the **Pierce pressure** text box.

For more information about piercing pressure, see “Optimizing piercing” on page 22.

5. Click **Start**.

The light turns orange, the plate stage is pulled into the PlatePierce and the door is closed. The **Press Pressure** increases until it reaches the **Pierce Pressure**, at which point the plate seal is pierced. Then the door opens and the plate stage presents the plate.

If the plate is not correctly positioned on the stage, the light turns red, the door opens before the seal is pierced, the stage presents the plate, and an error dialog box opens. In this case, reposition the

plate and click **Retry**. Otherwise, click **Abort** to cancel the operation.

**Measuring
PlatePierce use**

The number of times a piercing operation is started is given in the odometer on the PlatePierce Diagnostics dialog box.

Odometer: 865 cycles performed

Turning off the PlatePierce

Procedure

This procedure allows you to turn off the PlatePierce and close the door, which you will need to do to move the PlatePierce.

To turn off the PlatePierce:

1. Press the Run button.
2. Time it so that when the door closes you turn off the power at the on/off switch.

You may need to manually close a small gap.

3. Turn off the air supply.
-

ActiveX commands

Introduction

In the following examples, "PlatePierce" is an object of a wrapper class that implements the CPlatePierceCtrl ActiveX control.

Properties are available through get() and set() methods of the interface.

Property: Blocking

Type

VT_BOOL

Comments

Determines if the code will run in blocking or non-blocking (multithreading) mode.

TRUE = blocking

FALSE = non-blocking

C++ Example

```
PlatePierce.SetBlocking(TRUE);
ASSERT(PlatePierce.GetBlocking());
```

Property: ControlPicture

Type

VT_PICTURE

Comments

Icon used to represent the ActiveX control

C++ Example

```
IPictureDisp* MyIcon;
PlatePierce.SetControlPicture(MyIcon);
```

Method: LONG Initialize(LPCTSTR Profile)

Type

Profile (see "Communicating with a PlatePierce" on page 24.)

Comments

Behavior:

- Retrieves the profile identified by Profile
- Opens the COM port found in the profile
- Checks that the PlatePierce is responding

Returns:

An HRESULT. In blocking mode, the value will be S_OK if the method is returned successfully, and an error code if it is not. The error is available with a call to GetLastError(). In non-blocking mode, the value will be S_OK if the thread was able to launch, an error code if not.

Events:

If in non-blocking mode, an InitializeSuccessful event is returned if successful, and an Error event if not successful.

C++ Example

```
PlatePierce.Initialize("my profile");
```

**Method: LONG
StartCycle(USHORT
Pressure)**

Arguments

Pressure

Comments

Behavior:

- Checks if the serial port is open.
- Sets the piercing pressure to the value of *Pressure*.
- Commands the PlatePierce to begin the press cycle.
- Polls the PlatePierce for its status, until it returns to its idle state, an error state, or if the press cycle has timed out. The polling operation is performed as a state self-transition, with a thread sleep time of 100 ms.

Returns:

An HRESULT. In blocking mode, the value will be S_OK if the method returned successfully, and an error code if not. The error is available with a call to GetLastError(). In non-blocking mode, the value will be S_OK if the thread was able to launch, and an error code if not.

Events:

If in non-blocking mode, a CycleSuccessful event is fired if successful, and an Error event is fired if not successful.

C++ Example

```
PlatePierce.StartCycle(60);
```

**Method: void
ShowDiagsDialog(VT
_BOOL Modal)**

Arguments

Modal

Determines if the diagnostics dialog window will be opened as a modal, or non-modal window. TRUE = modal.

Comments

Behavior:

Creates the diagnostics dialog box.

C++ Example

```
PlatePierce.ShowDiagsDialog(TRUE);
```

**Method: BSTR
GetLastError()**

Arguments

None

Comments

Returns:

A string corresponding to the last error encountered. This method provides the standard way of determining the nature of an error in blocking mode (since error events are not used), but is also applicable in non-blocking mode.

C++ Example

```
PlatePierce.SetBlocking(TRUE);
if (PlatePierce.StartCycle(-10)!= S_OK) {
// Using a pressure of -10 psi (-0.069 MPa) will cause an error. Print it to
screen.
    cout << PlatePierce.GetLastError();
}
```

**Method: VARIANT
EnumerateProfiles()****Arguments**

None

Comments

Returns:

A variant containing a SAFEARRAY of BSTR values, representing the names of the profiles in the ActiveX. If no profiles are available, the variant will be empty.

C++ Example

```
VARIANT vaResult = PlatePierce.EnumerateProfiles();
```

**Methods: LONG
Abort(), LONG
Ignore(), LONG
Retry()****Arguments**

None

Comments

Returns:

In each case, an HRESULT. An S_OK will be returned if the method is returned successfully, and an error code if not. The corresponding error can be retrieved by a call to the GetLastError() method.

Behavior:

- If the Initialize() or StartCycle() methods fail, these methods may be called to take further action.
- Abort() dictates that the PlatePierce will stop execution of the current command.
- Ignore() will cause the PlatePierce to ignore the current error and continue with the current command.
- Retry() will cause the PlatePierce to ignore the current error and retry the current command.

C++ Example

```
PlatePierce.SetBlocking(TRUE);
if (PlatePierce.Initialize("profile 1")!= S_OK) {
// If "profile 1" does not exist
    PlatePierce.ShowDiagsDialog(FALSE);
// open up the diagnostics and create a profile of that name
}
PlatePierce.Retry();
// try again
```

Maintenance and troubleshooting

Cleaning the pin plate

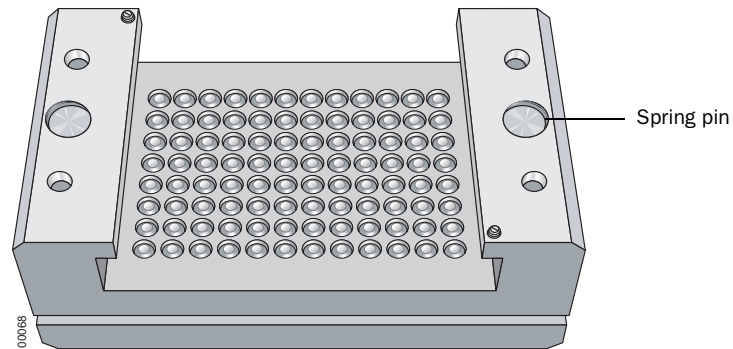
Depending on how much your PlatePierce is used, periodically inspect the pin plate and clean it if necessary.

To clean the pin plate:

1. Place the pin plate in an ultrasonic bath containing sufficient water to cover it.
2. Run the ultrasonic bath for a short period, inspect the pin plate, and repeat if necessary.

The cleaning ability of ultrasonic water baths varies with the water temperature, ultrasonic power, frequency and sweep rate that you choose.

3. Dry the pin plate.
4. Place two drops of oil around the edges of each of the spring pins.



Actions reference

Introduction

This section describes what happens when you perform particular actions, based on the current state of the PlatePierce.

The PlatePierce has five operational variables that together define its state. The variables are:

- Door: open or closed
- Pin plate: up or down
- Status light: green, blinking green, orange, blinking orange or red.
- Air supply: on or off
- Power supply: on or off

Each of the following tables describes a sequence of actions and the effects of each individual action. Use these tables at any time to predict what will happen as you perform an action, based on the current state of your PlatePierce. In the tables, each row represents one step in the overall procedure of the table.

Note: Occasionally the pin plate does not fall when the air is turned off because of normal friction.

Starting up with the door closed: air on before power

Initial State	Action	Result	Final State
Door: closed Pin plate: down Light: off Air: off Power: off	Turn air on	No visible change	Door: closed Pin plate: down Light: off Air: on Power: off
Door: closed Pin plate: down Light: off Air: on Power: off	Turn power on	Light blinks green	Door: closed Pin plate: down Light: blinking green Air: on Power: on
Door: closed Pin plate: down Light: blinking green Air: on Power: on	Push Run button	Pin plate moves up Door opens and plate is presented Light turns solid green	Door: open Pin plate: up Light: solid green Air: on Power: on

**Starting up with the
door closed: power
on before air**

Initial State	Action	Result	Final State
Door: closed Pin plate: down Light: off Air: off Power: off	Turn power on	Light blinks green	Door: closed Pin plate: down Light: blinking green Air: off Power: on
Door: closed Pin plate: down Light: blinking green Air: off Power: on	Turn air on	No change	Door: closed Pin plate: down Light: blinking green Air: on Power: on
Door: closed Pin plate: down Light: blinking green Air: on Power: on	Push Run button	Pin plate moves up Door opens and plate is presented Light turns solid green	Door: open Pin plate: up Light: solid green Air: on Power: on

**Starting up with the
door open: air on
before power**

Initial State	Action	Result	Final State
Door: open Pin plate: down Light: off Air: off Power: off	Turn the air on	No change	Door: open Pin plate: down Light: off Air: on Power: off
Door: open Pin plate: down Light: off Air: on Power: off	Turn the power on	Light blinks green	Door: open Pin plate: down Light: blinking green Air: on Power: on

Initial State	Action	Result	Final State
Door: open Pin plate: down Light: blinking green Air: on Power: on	!!HAZARD !! Make sure that your hands are not inside the PlatePierce before performing this step. The pin plate will rise with considerable force. Press the Run button	Pin plate moves up Light turns solid green	Door: open Pin plate: up Light: solid green Air: on Power: on

Starting up with the door open: power on before air

Initial State	Action	Result	Final State
Door: open Pin plate: down Light: off Air: off Power: off	Turn the power on	Light blinks green	Door: open Pin plate: down Light: blinking green Air: off Power: on
Door: open Pin plate: down Light: blinking green Air: off Power: on	Turn the air on	No change	Door: open Pin plate: down Light: blinking green Air: on Power: on
Door: open Pin plate: down Light: blinking green Air: on Power: on	!!HAZARD !! Make sure that your hands are not inside the PlatePierce before performing this step. The pin plate will rise with considerable force. Press the Run button	Pin plate moves up Light turns solid green	Door: open Pin plate: up Light: solid green Air: on Power: on

Turning off: air off before power

We do not recommend that you turn the PlatePierce off in this order. See “Turning off the PlatePierce” on page 27 for the proper procedure.

Initial State	Action	Result	Final State
Door: open Pin plate: up Light: solid green Air: on Power: on	Turn the air off	The pin plate moves down	Door: open Pin plate: down Light: solid green Air: off Power: on !!HAZARD !! If you now plan to turn on the air, make sure that your hands are not inside the PlatePierce. The door will remain open and the pin plate will rise with considerable force.
Door: open Pin plate: down Light: solid green Air: off Power: on	Turn the power off	No change	Door: open Pin plate: down Light: off Air: off Power: off

Turning off power off before air

Initial State	Action	Result	Final State
Door: open Pin plate: up Light: solid green Air: on Power: on	Turn the power off	Light turns off	Door: open Pin plate: up Light: off Air: on Power: off
Door: open Pin plate: up Light: off Air: on Power: off	Turn the air off	No change	Door: open Pin plate: up Light: off Air: off Power: off

Index

Note: You can also use the online help to search for information. You can download the latest version from the www.velocity11.com/support/support.html.

A

- Acrobat reader, 4
- Acrobat viewer, 4
- ActiveX software
 - commands, 28
 - description, 10
 - finding the version, 2
- air connector, 8
- air requirements, 13
- air tubing, 14

B

- bench space requirements, 13
- BioCel, 2

C

- COM port, 23, 24
- computer requirements, 13
- connecting to computer, 23
- connection panel, 8
- current state, 33

D

- diagnostics. *see* PlatePierce Diagnostics
- disposing of waste, 7
- documentation to read, 2
- door, 8

E

- electrical requirements, 13
- errors in software, reporting, 6
- errors in user guide, reporting, 6

F

- Find button, 4
- foam insert, 14
- footprint requirements, 13

H

- hardware features, 8

I

- initializing, 25

L

- lab automation system, 23

- laboratory requirements, 13
- labware requirements, 13

M

- maintenance, 32
- Materials Safety data Sheet. *see* MSDS
- MSDS, 7

O

- odometer, 26
- on/off switch, 8
- online help
 - opening, 3
- online user guides
 - using advanced search, 3
 - when to use, 3

P

- packing kits, 12
- parts, 12
- PDF guide, 4
- PDF help system, opening, 5
- pierce pressure
 - about, 25
 - setting, 22
- piercing
 - on lab-automation systems, 25
 - optimizing, 22
 - stand-alone mode, 20
- piercing multiple layers, 22
- pin plate
 - changing, 17
 - cleaning, 32
- plate sensor, 8
- plate stage, 8, 15
- PlatePierce actions, 33
- PlatePierce Diagnostics software, 11, 23, 24
- power entry module, 8
- power, operating specifications, 13
- press pressure, 25
- pressure
 - adjusting in stand-alone mode, 20
- profile, creating, 24

R

- reporting errors, 6

S

- safety
 - labels, 7
 - training, 7
- safety information, 14
- SBS standards, 13
- serial connector, 8
- setting up, 14
- software
 - installing, 23
 - overview, 10
- software CD-ROM, 23
- software version, 2
- spring pin, 32
- stand-alone mode, 20
- starting up, 33, 34, 35
- status light, 8, 33
- stopping an operation, 20

- support insert
 - adding, 15
 - choosing, 15
 - location, 8
- system requirements. *see* computer requirements

T

- test container software, 10
- thumbscrew, 17
- troubleshooting, 32
- turning off, 27, 35, 36

V

- version, software, 2

W

- warranty, 7
- waste disposal, 7