Symphony & Quartet

Quick Start Guide

Protein Technologies, Inc.

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WARNING ALL REACTION VESSELS AND/ OR RINSE TUBES MUST BE IN PLACE AT ALL TIMES.

WARNING COLLECTION VIALS MUST BE IN PLACE AT ALL TIMES.

WARNING DO NOT ATTEMPT TO MOVE THE SYMPHONY WHILE ANY OF THE SOLVENT OR WASTE CONTAINERS CONTAIN LIQUIDS.

WARNING THIS INSTRUMENT CONTAINS SOLVENTS AND CHEMICALS THAT SHOULD BE HANDLED CAREFULLY. MANY ARE EASILY ABSORBED THROUGH THE SKIN AND CAN CAUSE ADVERSE HEALTH EFFECTS. WEAR SAFETY GLASSES, PROTECTIVE CLOTHING AND RUBBER GLOVES AT ALL TIMES. FOLLOW MSDS HANDLING GUIDELINES PROVIDED WITH THE INDIVIDUAL REAGENTS. RESPIRATORS AND ABSORBENT SHOULD BE AVAILABLE IN THE EVENT OF A SPILL.

WARNING THE CLEAVE COLLECT AREA HAS A DRAIN FEATURE SO IF A MECHANICAL FAILURE CAUSES THE COLLECT VIALS TO OVERFLOW, THE FLUID WILL DRAIN INTO THE SOLVENT CABINET TRAY. SHOULD YOU SEE ANY FLUID IN THE TRAY FROM THIS, YOU NEED TO CONTACT PROTEIN TECHNOLOGIES, INC. OR YOUR DISTRIBUTOR FOR SERVICE.

Contents

Introduction

Thank you for purchasing your new Symphony from Protein Technologies, Inc. The Symphony is a fully automated, parallel synthesizer with completely independent reaction vessels, allowing you to start and stop individual syntheses whenever you please. This capability makes the Symphony unmatched in the parallel solid-phase synthesis market.

About This Book

This book helps you get started with the Symphony.

- Chapter 1, **Instrument Layout**, introduces you to the basic layout of the Symphony.
- Chapter 2, **Accessories**, introduces you to the accessories offered for the Symphony.
- Chapter 3, **Instrument Setup**, introduces you to the basic software and procedures required to set up a synthesis on the Symphony.

About The Company

Protein Technologies, Inc. (PTI) is built on the belief that our products and services must be of the highest possible quality. Our products are supported by a dedicated field service team, and we are proud of our reputation for reliability.

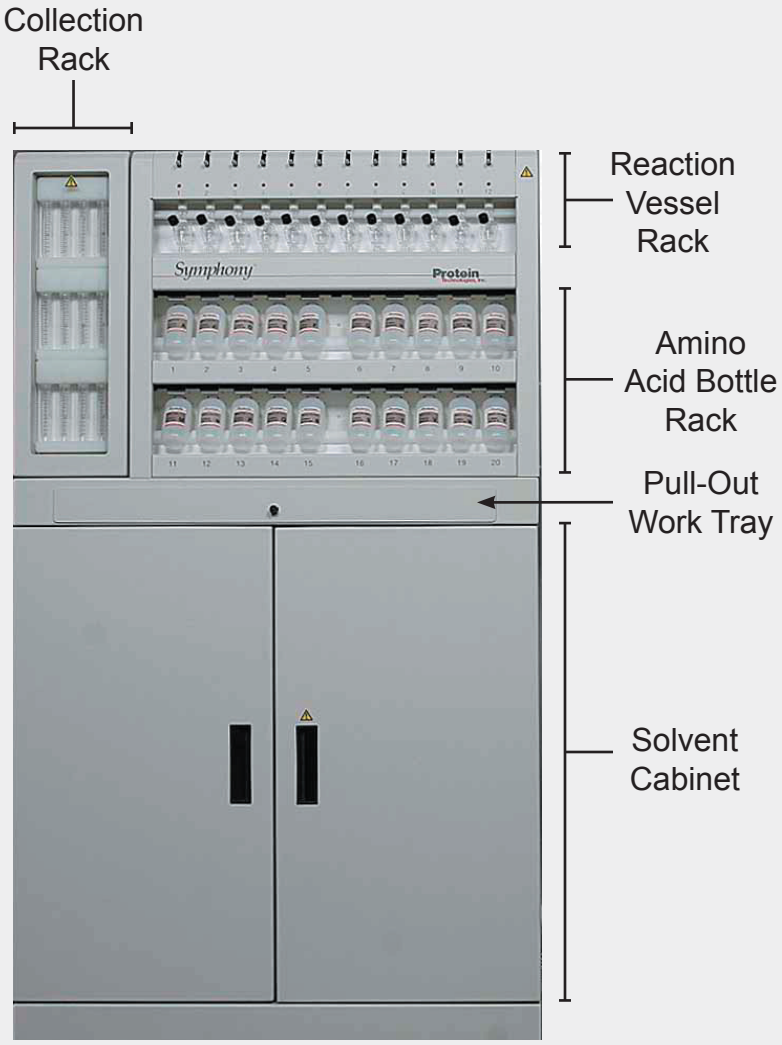
Founded in 1985 by researchers affiliated with the University of Arizona in Tucson, PTI launched its first peptide synthesizer, the PS3, in 1990. Since then, PTI has manufactured and sold the world's finest solid-phase synthesizers.

Today we are growing and innovating to serve the needs of the solid-phase synthesis market. We are here to help. If you have any questions or ideas for new instruments, please feel free to contact us:

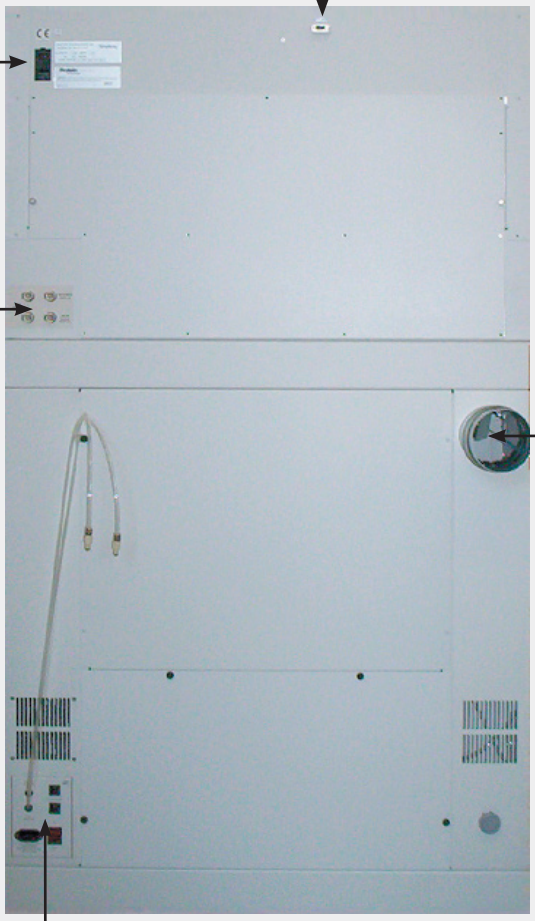
Tel: 520-629-9626
Toll Free: 800-477-6834
Fax: 520-629-9806
E-mail: info@pti-instruments.com
www.pti-instruments.com

Chapter 1: Instrument Layout

Symphony Front



Symphony Back



Vacuum/Air Pump Controls:

- Vacuum/Air Hose Outlets
- Circuit Breakers
- Power Plug
- On/Off Switch

Solvent Cabinet

Chapter 2: Accessories

Reaction Vessels & O-Rings

Small
Glass
9 mL
#SMP-010135

Standard
Glass
16 mL
#SMP-010092

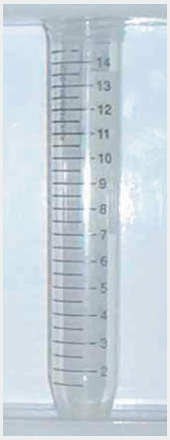
Large
Glass
32 mL
#SMP-010134

Disposable
Plastic
26 mL
#SMP-RV-012
#SMP-RV-100
#SMP-RV-500

Reaction Vessel O-Rings:
Part #SMP-270054

Collection Vials

Standard
Plastic
15 mL
#3100013
(Pack of 50)



Large
Glass
45 mL
#SMP-LGCLTB
(1 each)
Instrument modification
required for installation

Amino Acids & Reagents for Peptide Synthesis

Protein Technologies, Inc. supplies high quality, pre-tested N-Fmoc-protected amino acids preweighed in 5 mmol and 10 mmol quantities in synthesizer-ready bottles (See Appendix A for listings), as well as bulk N-Fmoc-protected amino acids preweighed in 25 g and 100 g quantities (See Appendix B for listings). We recommend using our amino acids for all of your synthesis needs.

Protein Technologies, Inc. supplies the following reagents for peptide synthesis on the Symphony:

CATALOG NO.	DESCRIPTION	QUANTITY
PS3-PPR-L	**Reagents:** 20% Piperidine/DMF (DEP)	0.9 L
PS3-MM-L	0.4 N-Methylmorpholine/DMF (ACT)	0.9 L
B-100-HBTU B-500-HBTU B-1K-HBTU	HBTU	100 g 500 g 1 kg
SMP-K5	**Start-Up Kits:** FMOC Amino Acid Start-up Kit for the Symphony and Symphony Quartet. Contains 1 ea. of 20 standard amino acids (5 mmol); 0.9 L Deprotectant; 0.9 L Activator and HBTU (100 g).	1 ea.

Replacement Parts/Accessories

Protein Technologies, Inc. supplies replacement parts for the Symphony, as well as various accessories, including solvent bottles and waste containers. A partial listing of replacement parts and accessories is located in Appendix C. For additional part and accessory information, please call our support desk at 1-800-477-6834.

Chapter 3: Setup Instructions

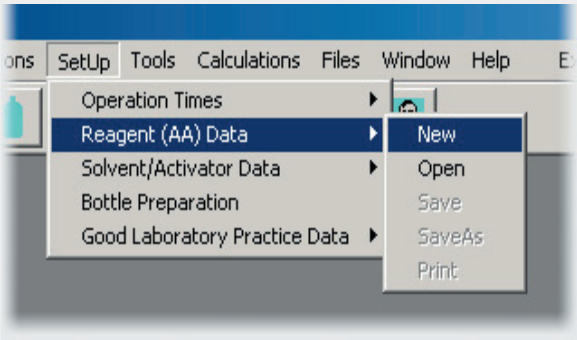
Define Amino Acid and Solvent Data Files

Symphony software has standard amino acid (**"standard.aa"**) and solvent (**"standard.slv"**) data files which can be opened and viewed through the **SetUp** menu under **"Reagent (AA) Data"** and **"Solvent/Activator Data,"** respectively. These files list the Symphony default settings.

Data files should reflect the solvents and reagents being used in a synthesis. If solvents and/or reagents other than the defaults will be used, new data files must be created.

Create a Reagent (AA) Data File

To create a new Reagent (AA) Data file, select **Reagent (AA) Data** under the **SetUp** menu, and click on **New**:

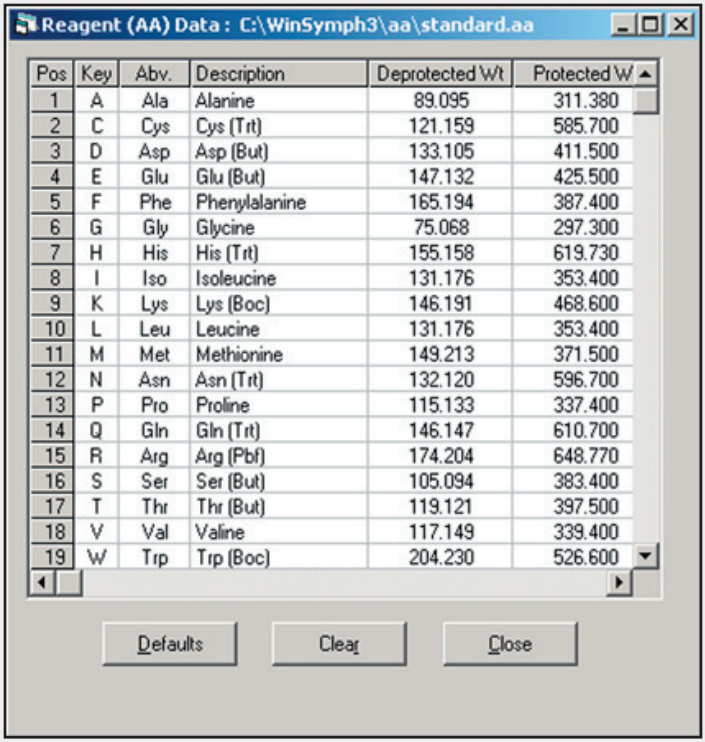


This will open the **Reagent (AA) Data** window.

To view default values, click on **Defaults** button in lower left corner. Reagent entries may be made directly or by modifying the default listings.

For each amino acid bottle position (Pos) enter:

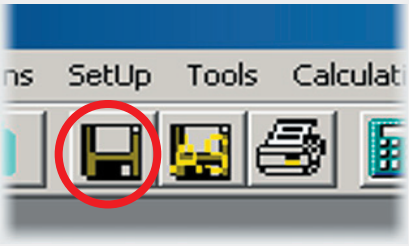
1. **Key** - Single letter abbreviation
2. **Abbreviation** - Three letter abbreviation
3. **Description** - Name or description of reagent
4. **Deprotected Weight** - Formula weight without protecting group(s)
5. **Protected Weight** - Formula weight including protecting group(s)



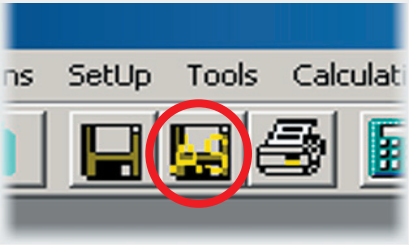
Pos	Key	Abv.	Description	Deprotected Wt	Protected W
1	A	Ala	Alanine	89.095	311.380
2	C	Cys	Cys (Trt)	121.159	585.700
3	D	Asp	Asp (But)	133.105	411.500
4	E	Glu	Glu (But)	147.132	425.500
5	F	Phe	Phenylalanine	165.194	387.400
6	G	Gly	Glycine	75.068	297.300
7	H	His	His (Trt)	155.158	619.730
8	I	Iso	Isoleucine	131.176	353.400
9	K	Lys	Lys (Boc)	146.191	468.600
10	L	Leu	Leucine	131.176	353.400
11	M	Met	Methionine	149.213	371.500
12	N	Asn	Asn (Trt)	132.120	596.700
13	P	Pro	Proline	115.133	337.400
14	Q	Gln	Gln (Trt)	146.147	610.700
15	R	Arg	Arg (Pbf)	174.204	648.770
16	S	Ser	Ser (But)	105.094	383.400
17	T	Thr	Thr (But)	119.121	397.500
18	V	Val	Valine	117.149	339.400
19	W	Trp	Trp (Boc)	204.230	526.600

Save a Data File

To save changes to a Data file, click on the **Save** shortcut shown below:



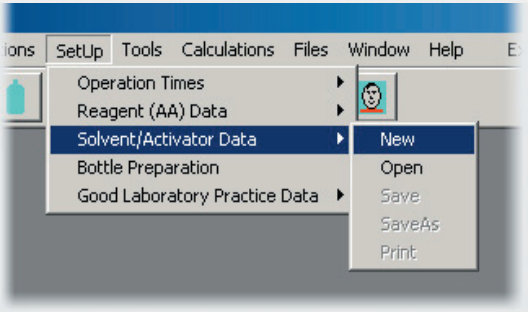
This will save changes to the currently active window. To save a newly created Data file, click on the **Save As** shortcut shown below:



This will open a new screen. Enter file name and click **Save**.

Create a Solvent/Activator Data File

To create a new Solvent/Activator Data file, select **Solvent/ Activator Data** under the **SetUp** menu, and click on **New**:



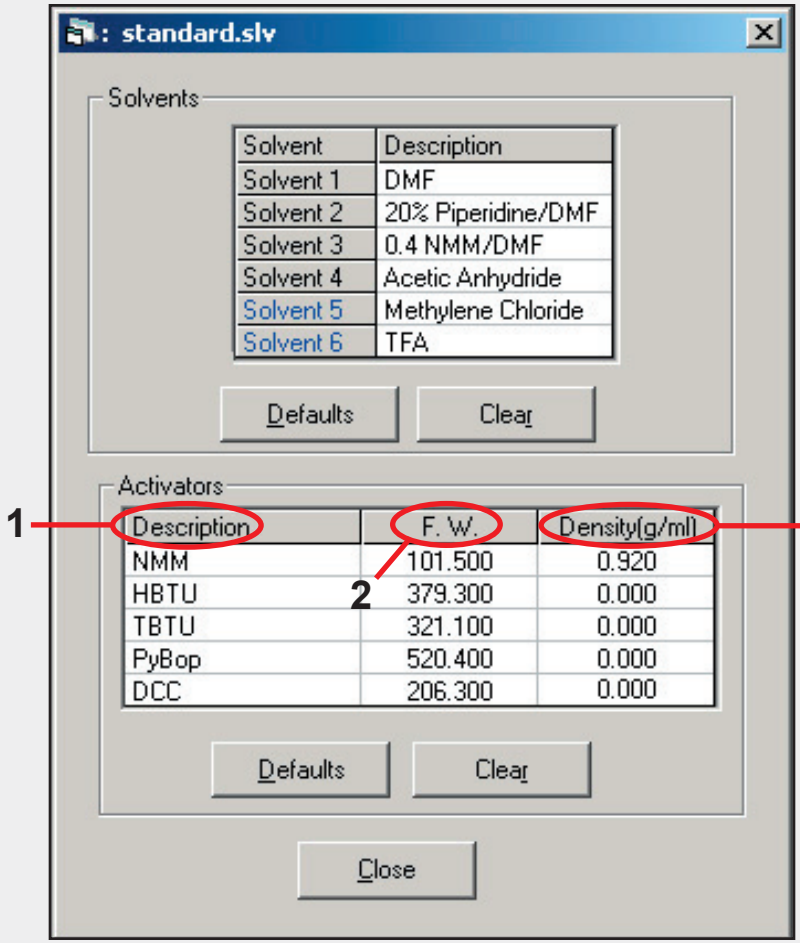
This will open the **Solvent/Activator Data** window.

To view default values, click on the **Defaults** button beneath each list. Reagent entries may be made directly or by modifying the default listings.

Under the **Solvents** list, enter the name or description of the solvent under **Description** for each solvent bottle position listed under **Solvent**.

Under the **Activators** list, enter the following for each activator component:

1. **Description** - Name or description of activator component
2. **F.W.** - Formula weight of activator component
3. **Density (g/mL)** - Density of activator component. If activator component is not a liquid, enter 0.000.



To save Solvent/Activator Data file, follow instructions on page 3-3.

Create a Program

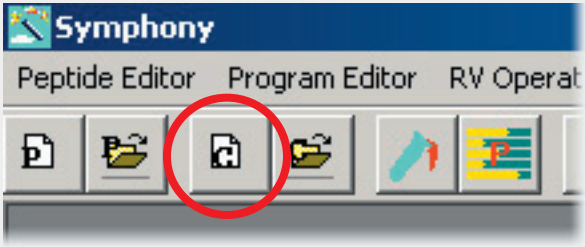
2 programs are required to run a synthesis on the Symphony:

1. **Swelling Program** (Synthesis program with extended initial wash times to swell the resin during the first step)
2. **Synthesis Program**

If automated cleavage is desired, a **Cleavage Program** is also necessary.

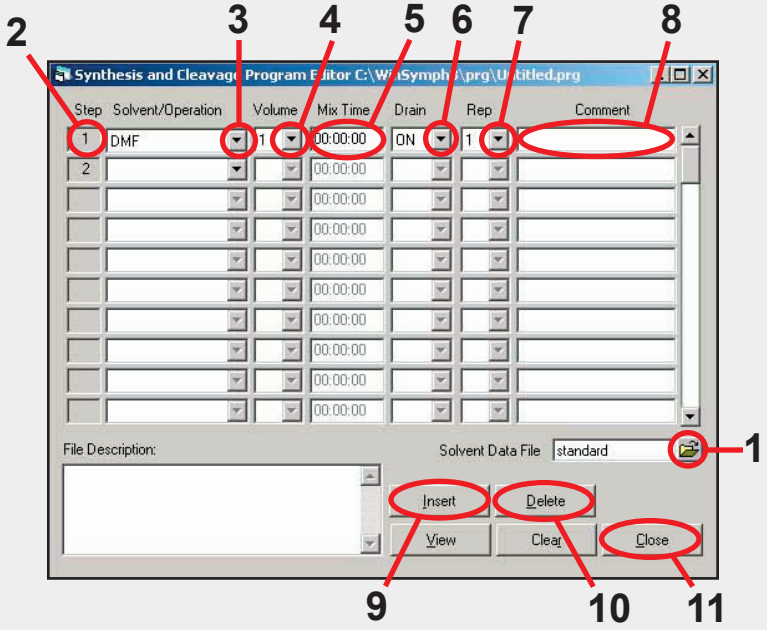
New Program

To create a new program, click on the New Program shortcut shown below:



Enter Program Values

1. **Solvent/Activator Data File** - Click on shortcut to select Solvent/Activator Data file
2. **Step** - Number indicates active row that can be modified
3. **Solvent/Operation** - Use pull-down menu to select appropriate solvent or operation for step
4. **Volume** - Use pull-down menu to select number of 1.25 mL aliquots delivered (1 = 1.25 mL, 9 = 11.25 mL)
5. **Mix Time** - Enter mix time in hh:mm:ss
6. **Drain** - Use pull-down menu to select “ON” or “OFF” to specify whether reaction vessel will be drained at end of step
7. **Rep** - Use pull-down menu to select number of times step will be performed
8. **Comment** - Add comment if desired
9. **Insert** - Inserts a new step above selected step
10. **Delete** - Deletes selected step
11. **Close** - Closes Program Editor



Helpful Hint:

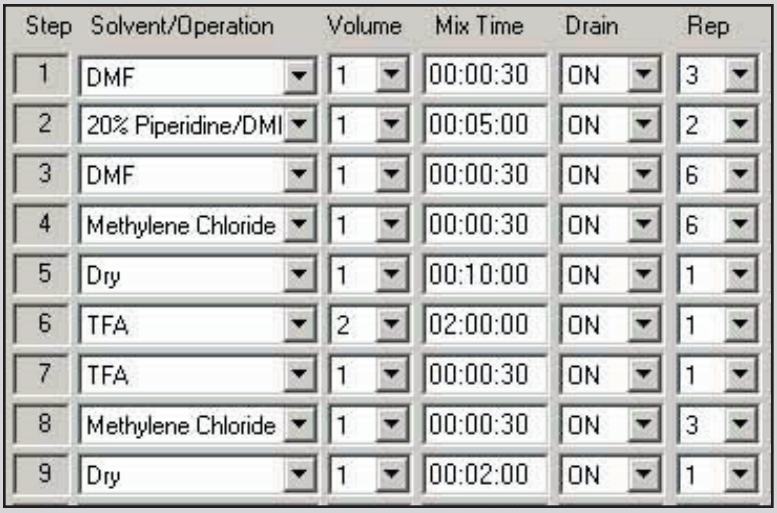
Symphony software includes the basic synthesis program “basic.prg,” the basic swelling program “basicsw.prg,” and the basic cleavage program “stdclv.clv” You can create new programs by modifying these basic programs and saving them under a new name.

Step	Solvent/Operation	Volume	Mix Time	Drain	Rep
1	DMF	1	00:00:30	ON	3
2	20% Piperidine/DMI	1	00:02:30	ON	2
3	DMF	1	00:00:30	ON	6
4	Reagent (AA)	1	00:00:00	OFF	1
5	0.4 NMM/DMF	1	00:20:00	ON	1
6	DMF	1	00:00:30	ON	3

basic.prg

Step	Solvent/Operation	Volume	Mix Time	Drain	Rep
1	DMF	1	00:10:00	ON	3
2	20% Piperidine/DMI	1	00:02:30	ON	2
3	DMF	1	00:00:30	ON	6
4	Reagent (AA)	1	00:00:00	OFF	1
5	0.4 NMM/DMF	1	00:20:00	ON	1
6	DMF	1	00:00:30	ON	3

basicsw.prg



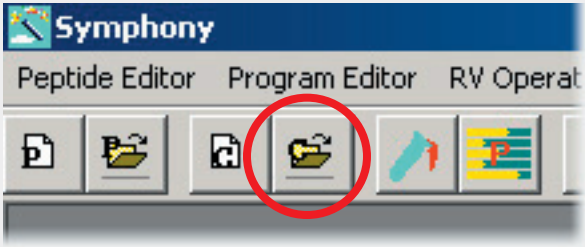
Step	Solvent/Operation	Volume	Mix Time	Drain	Rep
1	DMF	1	00:00:30	ON	3
2	20% Piperidine/DMI	1	00:05:00	ON	2
3	DMF	1	00:00:30	ON	6
4	Methylene Chloride	1	00:00:30	ON	6
5	Dry	1	00:10:00	ON	1
6	TFA	2	02:00:00	ON	1
7	TFA	1	00:00:30	ON	1
8	Methylene Chloride	1	00:00:30	ON	3
9	Dry	1	00:02:00	ON	1

stdclv.prg

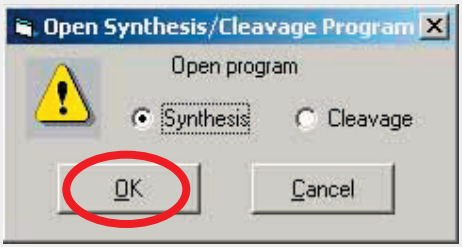
CAUTION Failure to save modifications under a new name will overwrite file.

Open an Existing Program

To open an existing program, click on the **Open program** shortcut shown below:



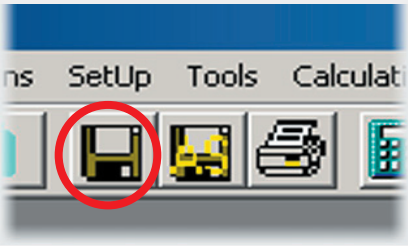
In the next box, select program type (Synthesis or Cleavage) and click **OK**.



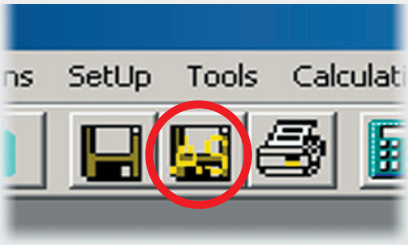
This will open a new screen. Select a program and click **Open**.

Save a Program

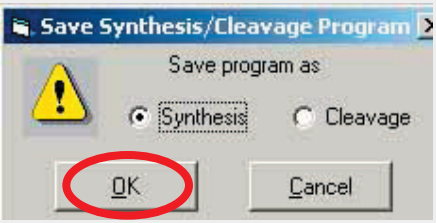
To save changes to an existing program, click on the **Save** shortcut shown below:



This will save the currently active window. To save a new program, click on the **Save As** shortcut shown below:



In the next box, select program type (Synthesis or Cleavage) and click **OK**.



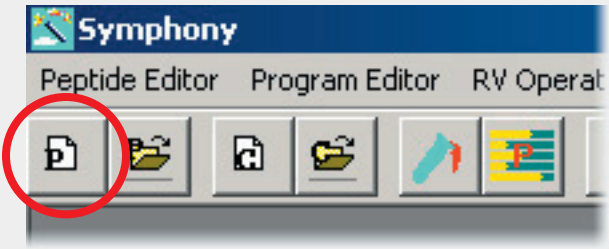
This will open a new screen. Enter file name and click **Save**.

Create a Peptide

The Symphony allows you to run a different program in each cycle. Use the **Peptide Editor** to enter a peptide sequence and assign a specific program to each amino acid.

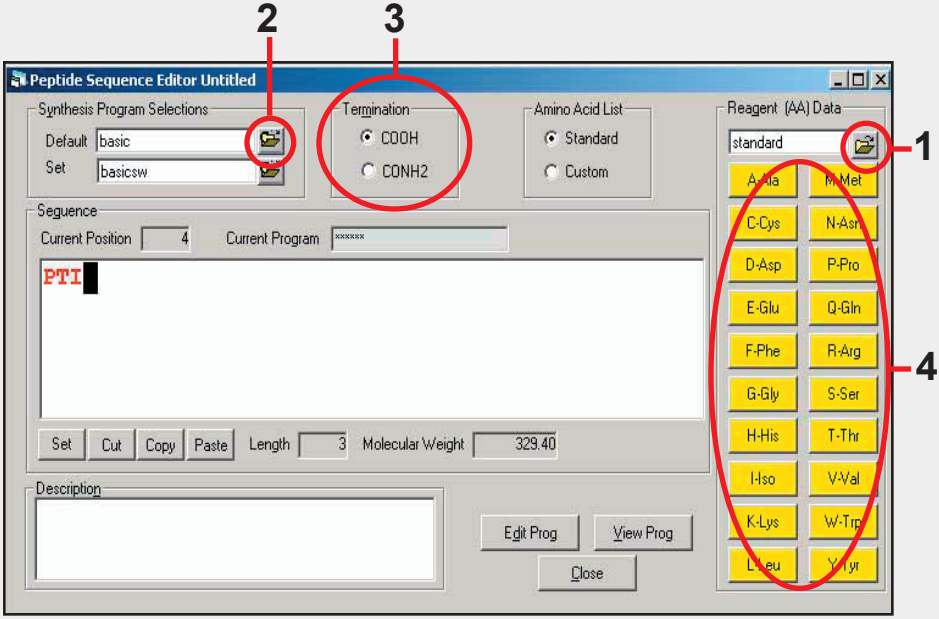
New Peptide

To create a new peptide, click on the **New Peptide** shortcut shown below:



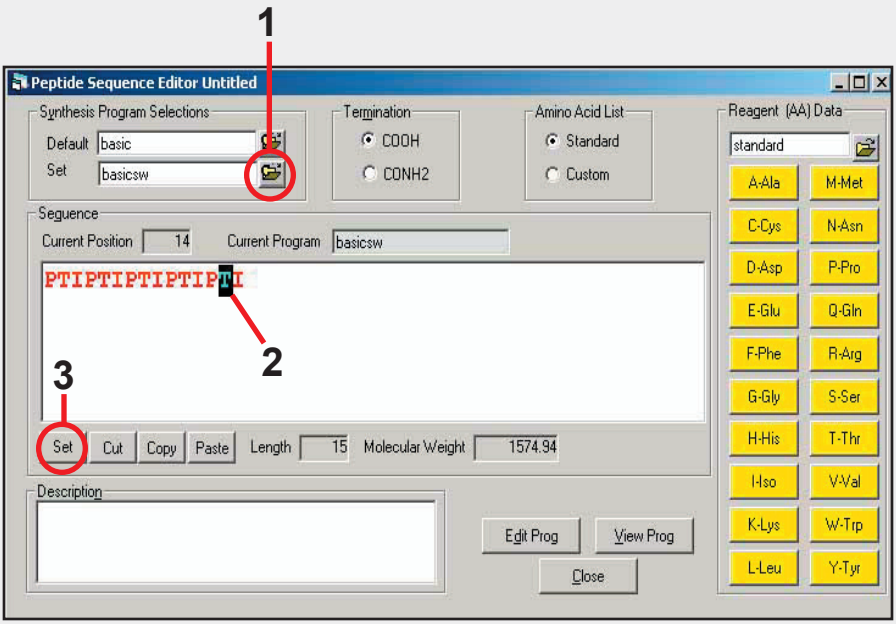
Enter a Sequence

1. **Select Reagent (AA) Data File** - Click on shortcut button. Select file and click **Open**.
2. **Select Default Program** - Click on shortcut button. This will open a new screen. Select program and click **Open**. This program will automatically be assigned to newly entered amino acids.
3. **Select Termination** - Select COOH or CONH2 to specify whether the C-terminus is an acid or an amide, respectively. If COOH is selected, synthesis will begin one amino acid to the left of the C-terminal (right-most) amino acid. If CONH2 is selected, synthesis will begin with the C-terminal amino acid itself.
4. **Enter Peptide Sequence** - Use buttons on right of screen or keyboard (using single letter amino acid abbreviations) to enter peptide sequence in the N to C direction.



Assign Programs

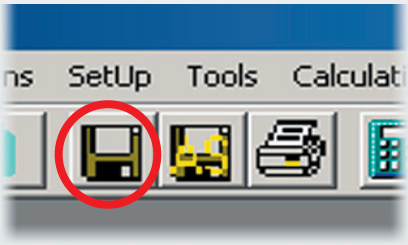
1. **Select Set Program** - Click on shortcut button. This will open a new screen. Select program and click **Open**.
2. **Highlight Amino Acid(s)** - Use mouse and/or arrow keys to highlight amino acid(s).
3. **Set Program** - Click **Set** to assign Set Program to highlighted amino acid(s).



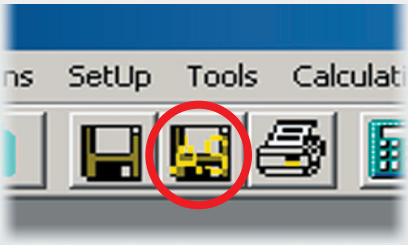
Set first cycle to run swelling program. If COOH is selected, synthesis will begin one amino acid to the left of the C-terminal (right-most) amino acid. If CONH2 is selected, synthesis will begin with the C-terminal amino acid.

Save a Peptide

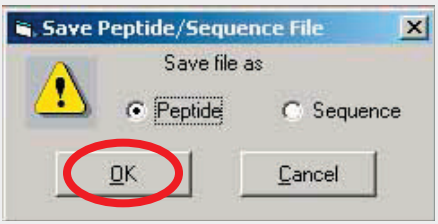
To save changes to an existing peptide, click on the **Save** shortcut shown below:



This will save the currently active window. To save a new peptide, click on the **Save As** shortcut shown below:



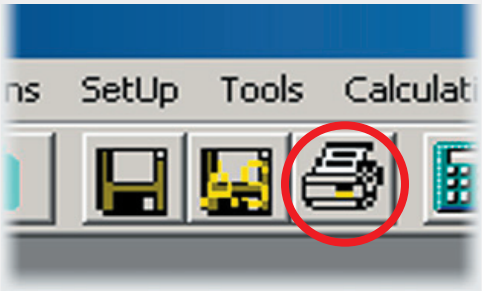
In the next box, select file type (Peptide or Sequence) and click **OK**.



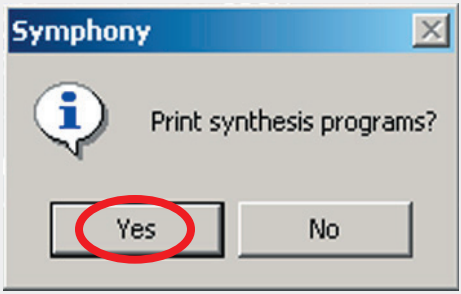
This will open a new screen. Enter file name and click **Save**.

Print a Peptide

To print a peptide, click on the **Print** shortcut shown below:



This will print the currently active window. In the next box, click on **Yes** to print synthesis programs.



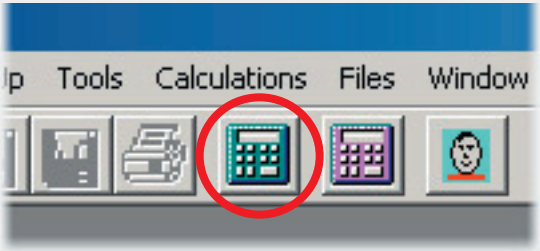
NOTE Always print out peptide and program files as a final check of sequences and programs before running a synthesis.

Calculate Reagent Amounts

The **Calculations Screen** can be used to calculate the amounts of resin and reagents you will need to prepare a synthesis on the Symphony. It will also calculate the synthesis time(s) as well as the theoretical peptide yield(s).

Open Calculations Screen

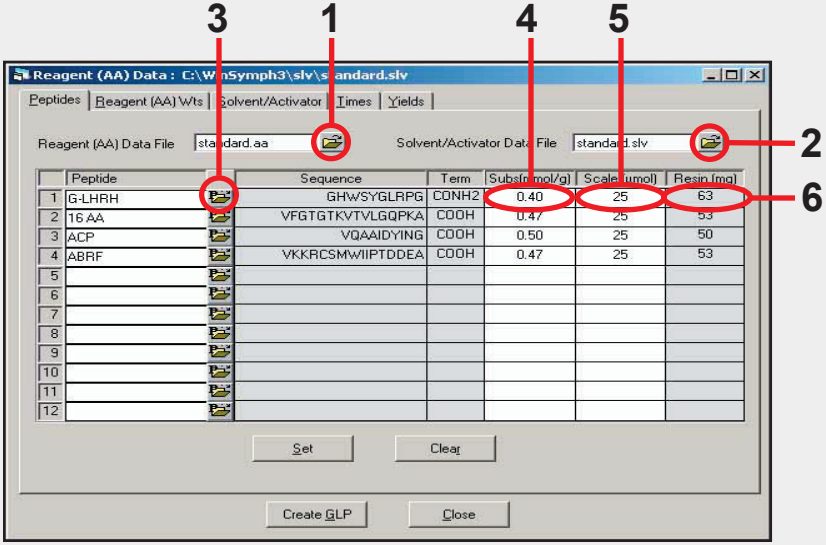
To open the **Calculations Screen**, click on the shortcut shown below:



Calculate Resin Amounts

In the **Calculations Screen** under the **Peptides** tab:

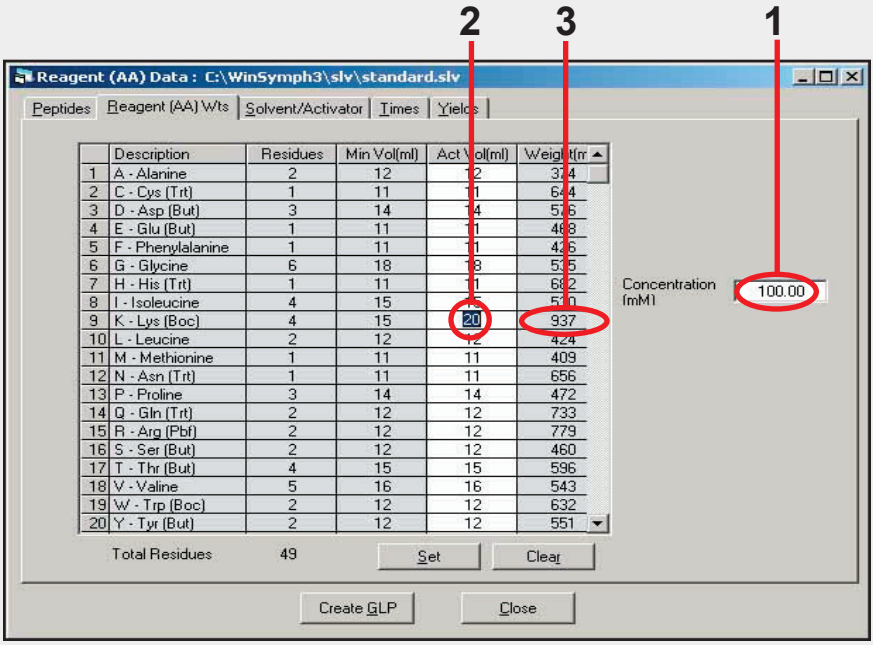
1. **Select Reagent (AA) Data File** - Click on shortcut to select Reagent (AA) Data File
2. **Select Solvent/Activator Data File** - Click on shortcut to select Solvent/Activator Data File
3. **Load Peptide(s)** - For each reaction vessel, click on shortcut button to right of Peptide name box. Select peptide and click **Open** to download peptide to reaction vessel.
4. **Enter Resin Substitution** - Use keyboard to enter the resin substitution (in mmol/g) in the "Subs(mmol/g)" column. Press **ENTER**.
5. **Enter Scale** - Use keyboard to enter the scale (in μmol) in the "Scale (umol)" column. Press **ENTER**.
6. **Resin Amount** - The software will calculate the amount of resin (in mg) needed for the reaction and display it in the column marked "Resin (mg)."



Calculate Reagent (AA) Amounts

In the **Calculations Screen** under the **Reagent (AA) Wts** tab:

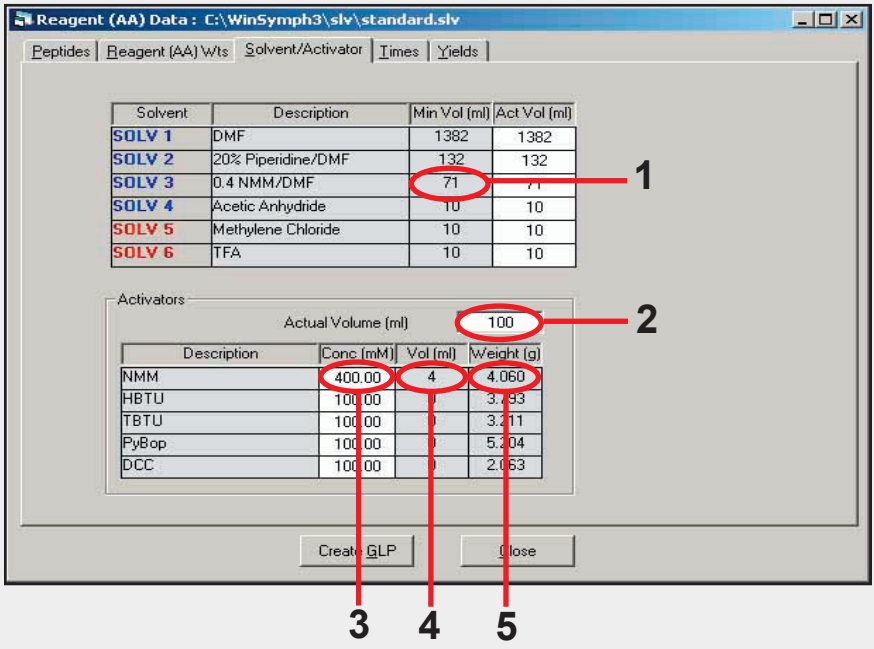
1. **Enter Concentration** - Enter amino acid concentration (in mM). Press **ENTER**.
2. **Enter Volume** - By default, the software will display the minimum reagent volumes required for the synthesis. Enter a new value in the "Act Vol(ml)" column if desired. Press **ENTER**.
3. **Amino Acid Amount** - The software will calculate the amino acid weight (in mg) needed for the synthesis based on the **Concentration** and **Actual Volume** values and display it in the column marked "Weight (mg)."



Calculate Solvent/Activator Amounts

In the **Calculations Screen** under the **Solvent/Activator** tab:

1. **Minimum Volume** - The software will calculate and display the minimum solvent volumes required for the synthesis in the "Min Vol (ml)" column.
2. **Enter Activator Volume** - Enter activator **Actual Volume** (in mL) if different from minimum volume. Press **ENTER**.
3. **Enter Activator Concentration** - Enter activator concentration (in mM) if different from default value. Press **ENTER**.
4. **Activator Volume** - The software will calculate the activator volume (in mL) needed for the synthesis based on the **Actual Volume** and **Concentration** values and display it in the column marked "Vol (ml)."

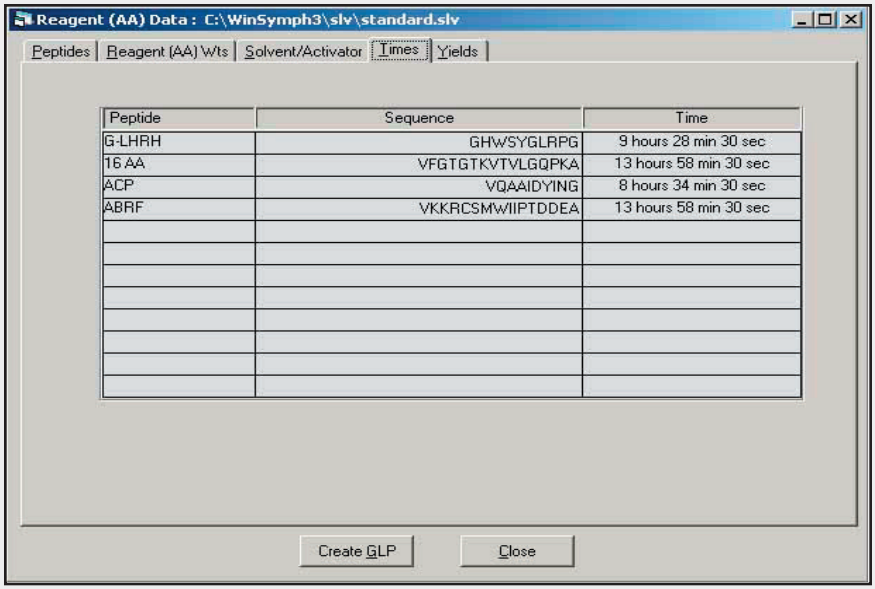


5. **Activator Weight** - Activator weights (in g) are displayed in the column marked “Weight (g).”

NOTE Make sure the Amino Acid and Activator concentrations match. The Activators list may also be used to calculate base or additive values.

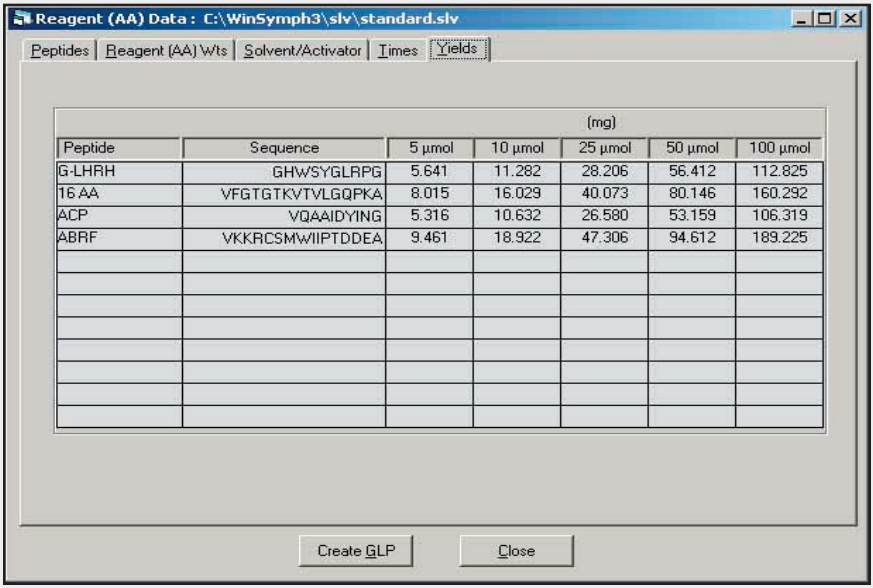
Calculate Times

In the **Calculations Screen** under the **Times** tab, the estimated synthesis time will be displayed for each peptide.



Calculate Yields

In the **Calculations Screen** under the **Yields** tab, the theoretical yields for the 5, 10, 25, 50, and 100 µmol scales will be calculated and displayed for each peptide.



Create a Good Laboratory Practice File

After calculations are complete, create a Good Laboratory Practice or GLP file by clicking on the **Create GLP** button at the bottom of the **Calculations Screen**. This will open a new window. Enter a file name and click **Save**.

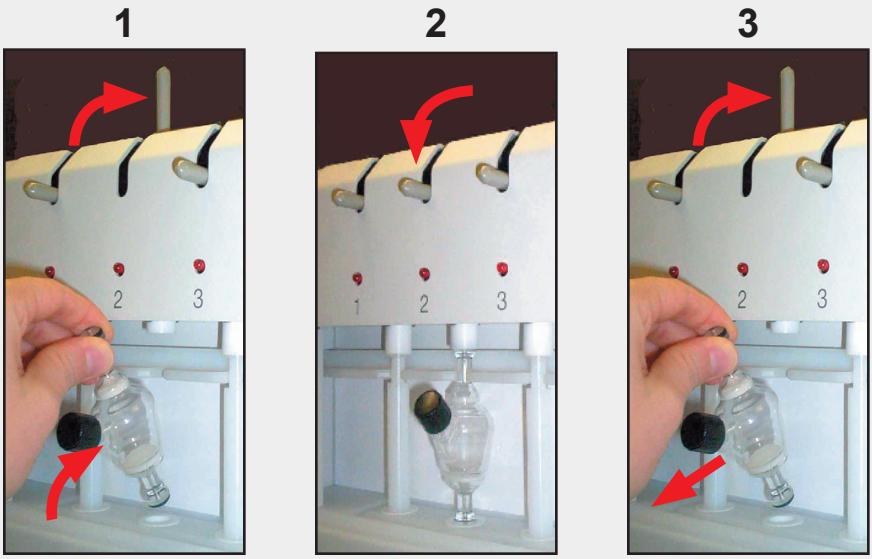
Instrument Setup

Prior to setting up the instrument in this section, you will need to prepare resins, amino acid solutions, and solvent solutions according to Symphony software calculations. In this section, you will learn to install:

1. reaction vessels
2. amino acid bottles
3. collection vials
4. solvent containers
5. waste container(s)

Reaction Vessel Installation

1. Position lever vertically to release clamp. Place vessel in lower seat first, then straighten it into upper seat.
2. Position lever horizontally to secure vessel in place. Twist vessel to ensure it is seated properly.
3. To remove vessel, lift lever and remove.



Amino Acid Bottle Installation

1. Pull back metal tab. Push bottle up into place.
2. Push metal tab in to secure but DO NOT FORCE.
3. To remove bottle, pull back metal tab and remove.

1

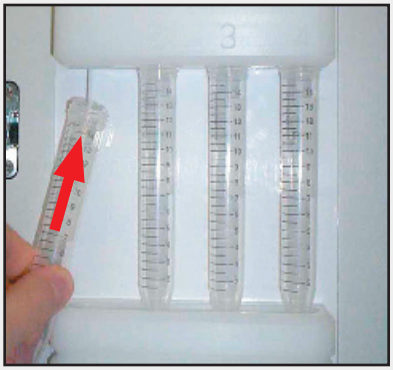
2

3

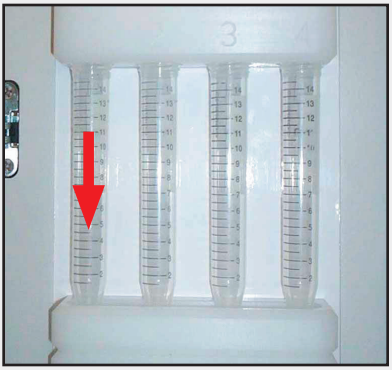
Collection Vial Installation

1. Insert vial, top first. Make sure the tubing is inserted IN-SIDE the vial to avoid spills and loss of product.
2. Secure in bottom seat.
3. To remove, lift vial up to release from bottom seat.
4. Remove vial.

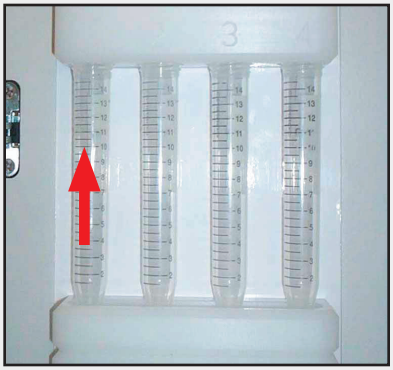
1



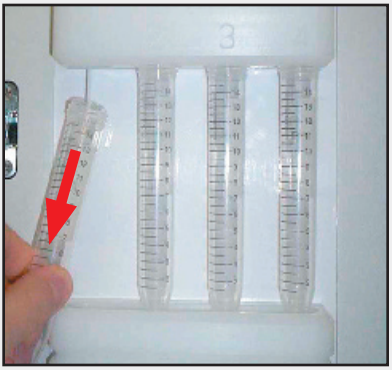
2



3



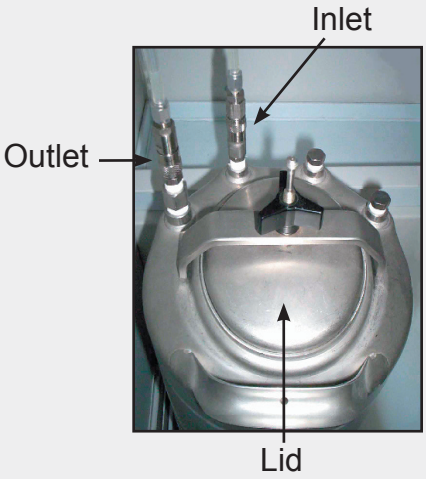
4



CAUTION Be careful when removing vials containing cleavage solution. Follow MSDS handling guidelines provided with the individual reagents.

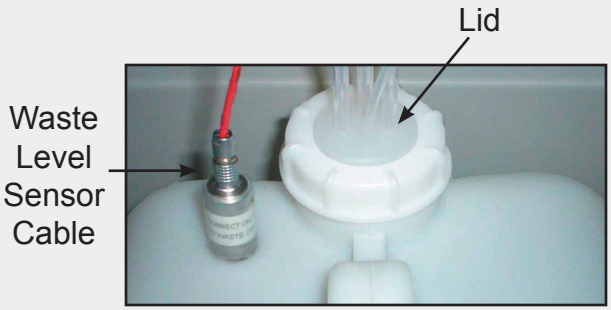
Solvent Container Installation

1. Fill 20 L (or 12 L) tank with solvent 1. Make sure inlet and outlet lines are connected (see below).
2. Place solvents 2-6 in appropriate bottles.



Waste Container Installation

1. Empty container. Replace lid.
2. Make sure waste level sensor cable is connected.

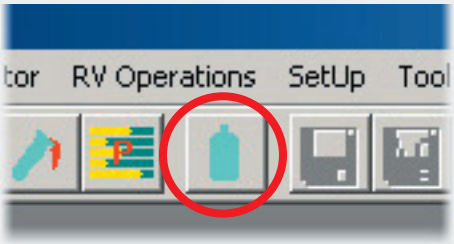


Bottle Preparation

Once reagent and solvent bottles have been filled and placed on the Symphony, the bottles should be pressurized and primed using the **Bottle Preparation Screen.** After a synthesis, the bottles should be vented and flushed with nitrogen prior to removal from the instrument.

Open Bottle Preparation Screen

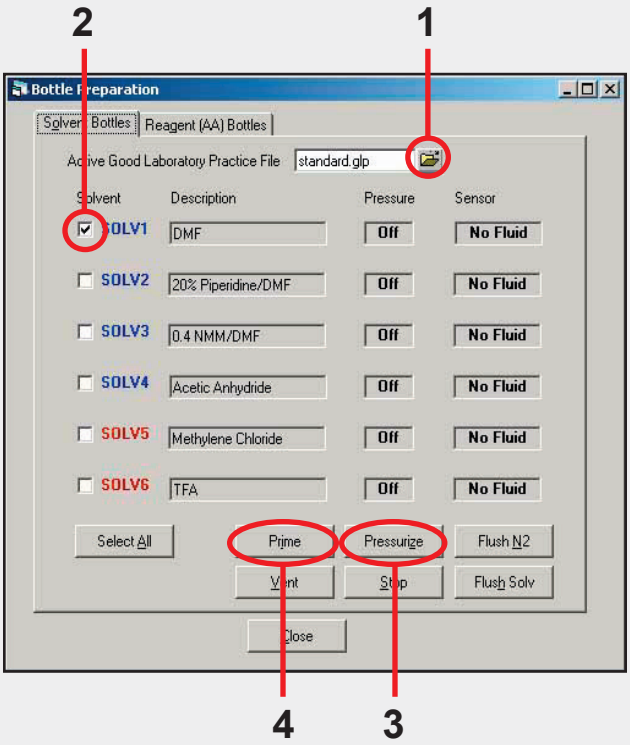
To open the **Bottle Preparation Screen**, click on the shortcut shown below:



Pressurize and Prime Bottles

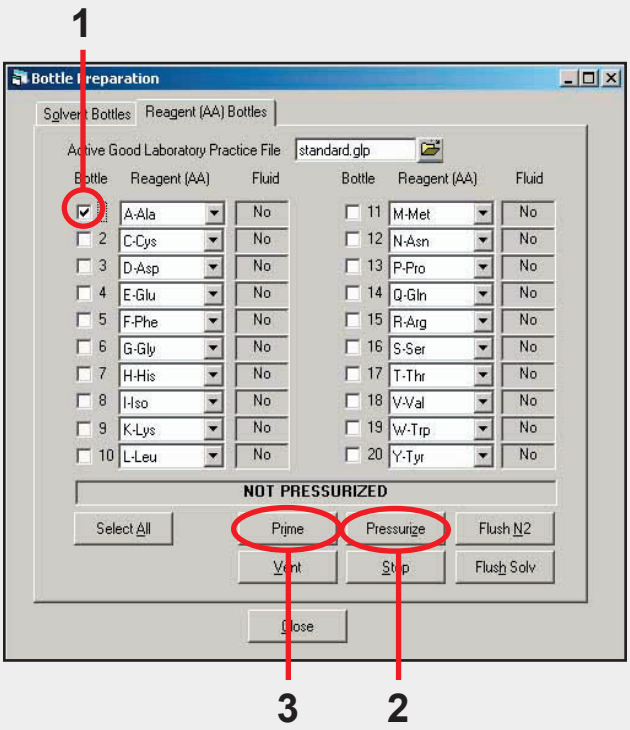
In the **Bottle Preparation Screen** under the **Solvent Bottles** tab:

1. **Select Active Good Laboratory Practice File** - Click on shortcut to select file. Refer to page 3-22.
2. **Select Solvent** - Check box to left of solvent or use **Select All** button at lower left to select all solvents.
3. **Pressurize Selected Solvents** - Click **Pressurize**. Pressurized solvents will display "On" in the Pressure column
4. **Prime Selected Solvents** - Repeat Step 1 to select solvents. Click **Prime**. Primed solvents will display "Fluid" in the Sensor column.



In the **Bottle Preparation Screen** under the **Reagent (AA) Bottles** tab:

1. **Select Bottles(s)** - Check box to left of reagent or use **Select All** button at lower left to select all reagents.
2. **Pressurize Selected Reagents** - Click **Pressurize**. The status bar beneath the reagent list will display “PRESSURIZED” when the reagents are pressurized.
3. **Prime Selected Reagents** - Repeat Step 1 to select reagents. Click **Prime**. Primed reagents will display “Yes” in the Fluid column.

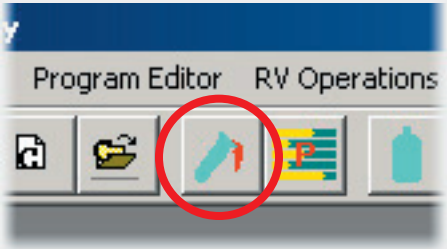


Synthesis Setup

Once all resins, reagents, solvents, collection vials and waste container(s) have been placed on the Symphony and the reagent and solvent bottles have been pressurized and primed, you are ready to begin a synthesis.

Open Reaction Vessel Operations Screen

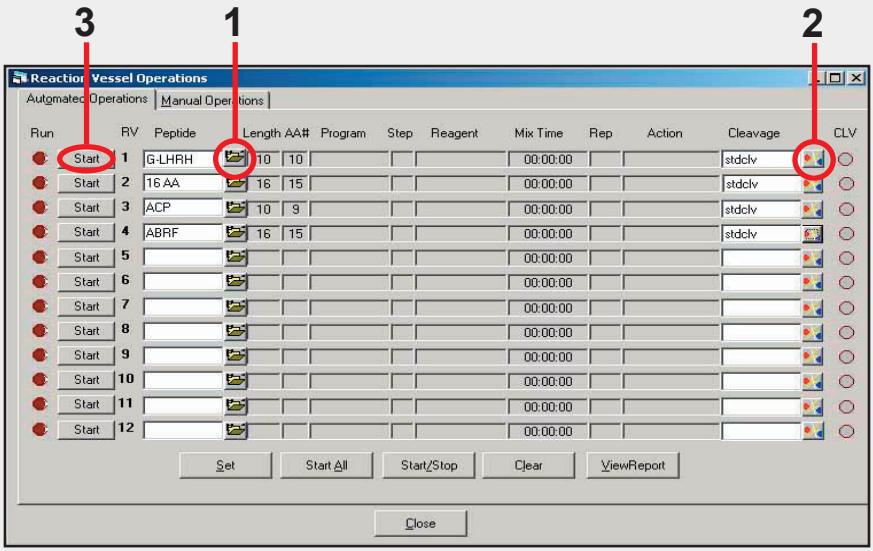
To open the **Reaction Vessel Operations Screen**, click on the shortcut shown below:



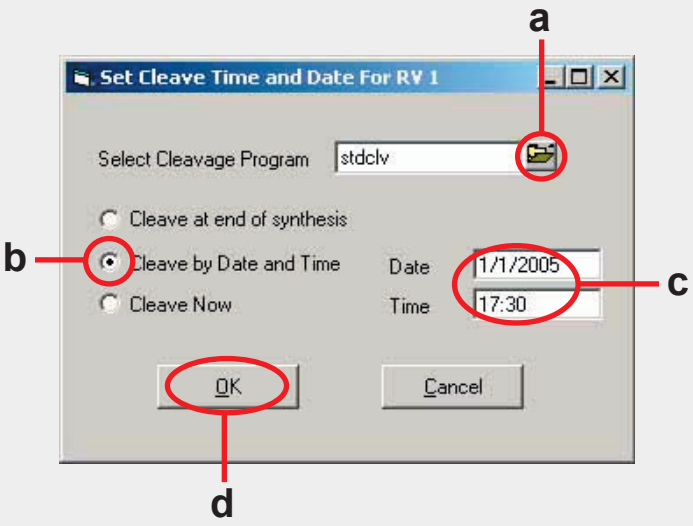
Start a Synthesis

In the **Reaction Vessel Operations Screen** under the **Automated Operations** tab:

1. **Load Peptide** - Click on shortcut button. This will open a new screen. Select peptide and click **Open**.



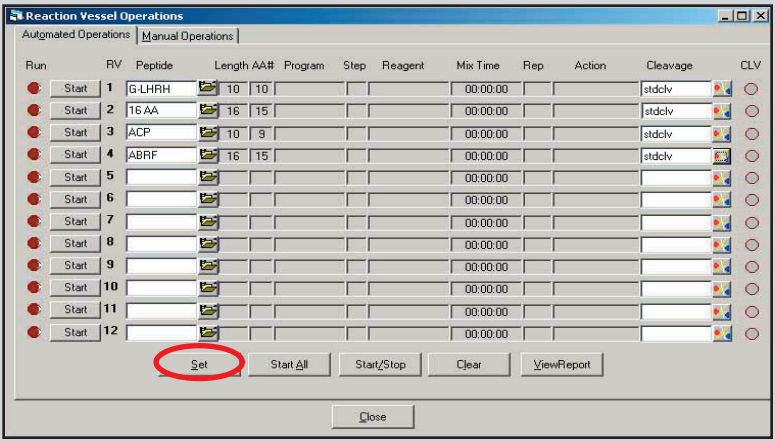
2. **Load Cleavage Program** - Click on shortcut button. This will open the **Set Cleave Time and Date for RV _** screen.
   a. **Select Cleavage Program** - Click on shortcut button. This will open a new screen. Select program and click **Open**.
   b. **Select Cleave Time** - Click circle to left of desired cleave time.
   c. **Set Cleave Date and Time** - If "Cleave by Date and Time" selected, enter in the date and time you want to begin cleavage. Otherwise, proceed to **d**.
   d. Click **OK**.



3. **Start Synthesis** - Click on the **Start** button.

Helpful Hint:

If you are planning to run the same peptide or cleavage conditions on multiple reaction vessels, use the **Set** button.



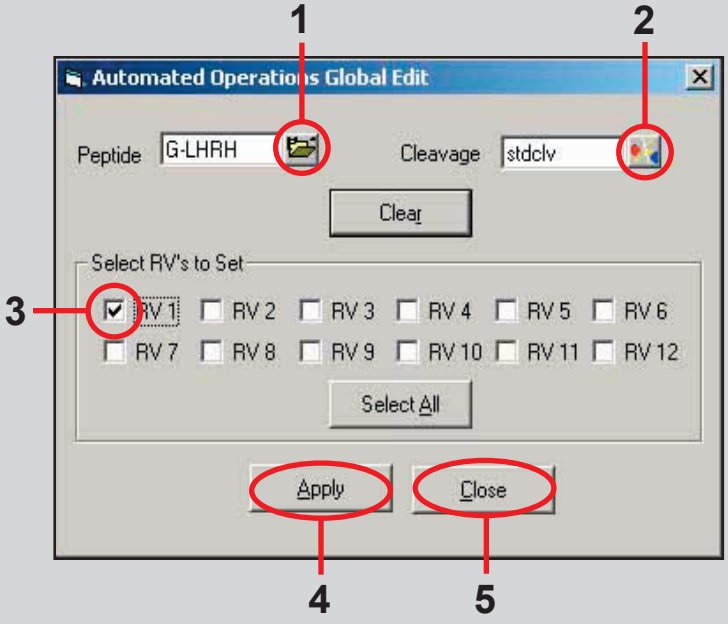
This will open the **Automated Operations Global Edit** screen.

continued on next page...

...**Helpful Hint** continued from previous page

In the **Automated Operations Global Edit** screen:

1. **Select Peptide** - Click on shortcut button. This will open a new screen. Select peptide and click **Open**. **Clear** button will erase selection.
2. **Select Cleavage Program** - Click on shortcut button. This will open a new screen. Select program and click **Open**. **Clear** button will erase selection.
3. **Select RV** - Check box to left of RV or use **Select All** button to select all RVs.
4. **Apply** - Click **on Apply** to load settings onto the **Automated Operations** screen.
5. **Close** - Click on **Close** to exit and return to the **Automated Operations** screen.



Chapter 4: Post-Synthesis Procedures

The following steps are required after every synthesis to clean the Symphony and prepare it for the next synthesis.

Collect Clean

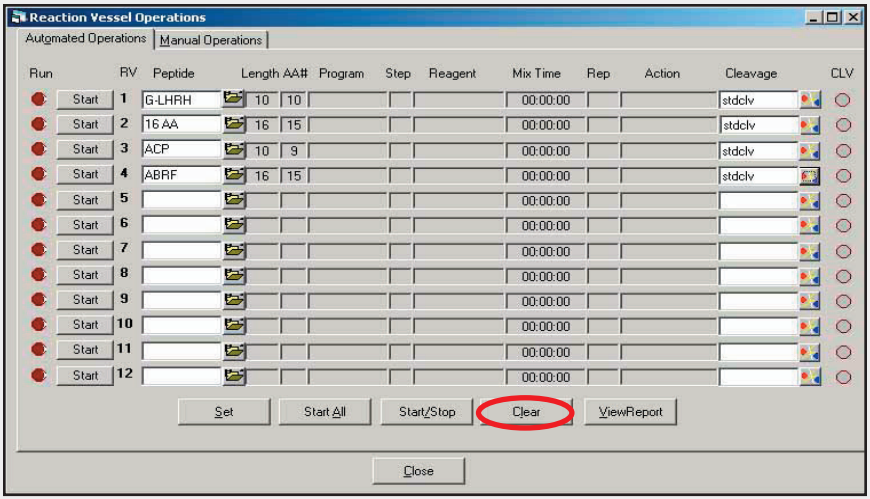
Collect Clean is only necessary if automated cleavage was performed on the instrument. After cleavage collection is complete, the word **Rinse** will be displayed on the **Start** button in the **Reaction Vessel Operations Screen** under the **Automated Operations** tab.

1. Remove collection vials containing cleaved peptide and replace with empty collection vials. Peptides can be precipitated in the removed collection vials with cold (< 0°C) ether.
2. Click on **Rinse** button.
3. This will open a warning window. Click **OK**. The collection lines will be rinsed with solvent 5.
4. When rinse is complete, remove collection vials, discard rinse solution and place clean, empty collection vials on the instrument for the next collection.

Clear Reaction Vessels

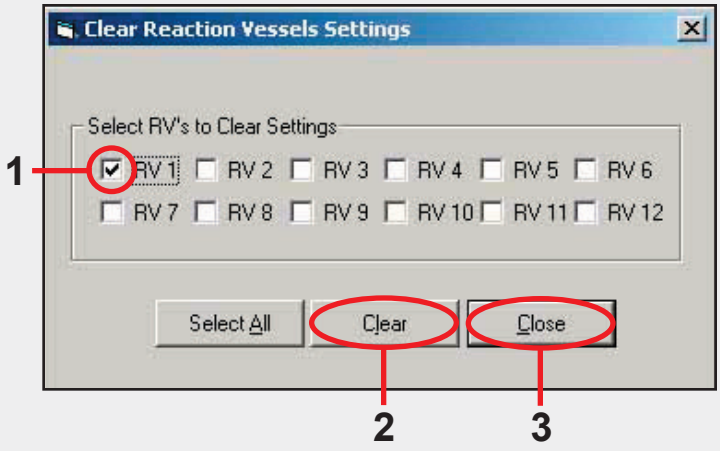
Following the Collect Clean operation, clear reaction vessels as follows. In the **Reaction Vessel Operations Screen** under the **Automated Operations** tab:

1. Click on **Clear** button.



This will open the **Clear Reaction Vessels Settings** window.

1. **Select RV(s)** - Check box to left of RV(s) or use **Select All** button to select all RVs
2. **Clear** - Click on **Clear** to clear loaded peptide(s) from **Automated Operations** screen.
3. **Close** - Click on **Close** to exit window.



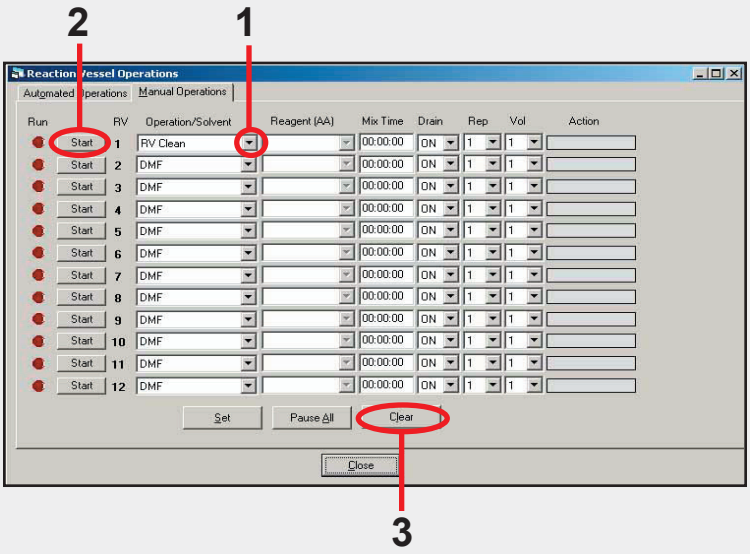
RV Clean

NOTE RV clean cannot be run on a reaction vessel channel while other reaction vessels are running.

After a synthesis has been performed in a reaction vessel(s), that channel(s) should be cleaned prior to running a new synthesis. Replace reaction vessel(s) with rinse tube(s). Install rinse tubes the same way as a reaction vessel with the skinny end at the top. Refer to section on **Reaction Vessel installation**, page 3-23. (Rinse tubes are also pictured alongside the reaction vessel.) This operation will rinse the channel

twice each with solvent 2, solvent 1 and solvent 5. Make sure these solvent bottles contain solvent and are pressurized and primed. In the **Reaction Vessel Operations** screen under the **Manual Operations** tab:

1. **Select RV Clean** - Use the pull down menu to select **RV Clean** from the **Operation/Solvent** column. Do not specify mix times, repetitions (Rep) or volumes (Vol). Repeat for each desired reaction vessel.
2. **Start** - Click **Start** button for desired reaction vessel(s).
3. **Clear** - After cleaning is complete, click on **Clear** button. This will open the **Clear Reaction Vessels Settings** window. Refer to page 3-33 for remaining instructions.



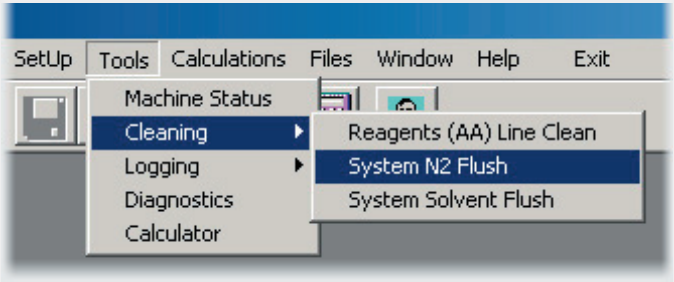
NOTE We recommend that RV clean be run on ALL channels even if only a few reaction vessels were used.

System N2 Flush

Prior to this operation, make sure to:

1. Place reaction vessels or rinse tubes in all reaction vessel positions.
2. Place collection vials in all collect positions.
3. Connect waste tank(s).
4. Place bottles in all bottle positions.

Under the **Tools** menu, under **Cleaning**, select **System N2 Flush**.



This will open a new window. Click **Start** to begin. This process should take approximately 20 minutes. Click **Close** to exit window upon completion.

Appendix

Appendix A

Symphony and Quartet Bottles Containing N-FMOC-Protected Amino Acids, Preweighed

CAT. NO.	DESCRIPTION	QUANTITY
SMP-05-A SMP-10-A	FMOC-L-Ala	5 mmol 10 mmol
SMP-05-RP SMP-10-RP	FMOC-L-Arg(Pmc)	5 mmol 10 mmol
SMP-05-RBF SMP-10-RBF	FMOC-L-Arg(Pbf)	5 mmol 10 mmol
SMP-05-NT SMP-10-NT	FMOC-L-Asn(Trt)	5 mmol 10 mmol
SMP-05-DB SMP-10-DB	FMOC-L-Asp(OtBu)	5 mmol 10 mmol
SMP-05-CA SMP-10-CA	FMOC-L-Cys(Acm)	5 mmol 10 mmol
SMP-05-CT SMP-10-CT	FMOC-L-Cys(Trt)	5 mmol 10 mmol
SMP-05-EB SMP-10-EB	FMOC-L-Glu(OtBu)	5 mmol 10 mmol
SMP-05-QT SMP-10-QT	FMOC-L-Gln(Trt)	5 mmol 10 mmol
SMP-05-G SMP-10-G	FMOC-L-Gly	5 mmol 10 mmol
SMP-05-HT SMP-10-HT	FMOC-L-His(Trt)	5 mmol 10 mmol
SMP-05-I SMP-10-I	FMOC-L-Ile	5 mmol 10 mmol
SMP-05-L SMP-10-L	FMOC-L-Leu	5 mmol 10 mmol
SMP-05-KBC SMP-10-KBC	FMOC-L-Lys(Boc)	5 mmol 10 mmol

CAT. NO.	DESCRIPTION	QUANTITY
SMP-05-M SMP-10-M	FMOC-L-Met	5 mmol 10 mmol
SMP-05-F SMP-10-F	FMOC-L-Phe	5 mmol 10 mmol
SMP-05-P SMP-10-P	FMOC-L-Pro	5 mmol 10 mmol
SMP-05-SB SMP-10-SB	FMOC-L-Ser(tBu)	5 mmol 10 mmol
SMP-05-TB SMP-10-TB	FMOC-L-Thr(tBu)	5 mmol 10 mmol
SMP-05-W SMP-10-W	FMOC-L-Trp	5 mmol 10 mmol
SMP-05-WBC SMP-10-WBC	FMOC-L-Trp(Boc)	5 mmol 10 mmol
SMP-05-YB SMP-10-YB	FMOC-L-Tyr(tBu)	5 mmol 10 mmol
SMP-05-V SMP-10-V	FMOC-L-Val	5 mmol 10 mmol

Appendix B

Bulk N-FMOC-Protected Amino Acids, Preweighed

CAT. NO.	DESCRIPTION	QUANTITY
B-25-A B-100-A	FMOC-L-Ala	25 g 100 g
B-25-RP B-100-RP	FMOC-L-Arg(Pmc)	25 g 100 g
B-25-RBF	FMOC-L-Arg(Pbf)	25 g
B-25-NT B-100-NT	FMOC-L-Asn(Trt)	25 g 100 g
B-25-DB B-100-DB	FMOC-L-Asp(OtBu)	25 g 100 g
B-25-CA	FMOC-L-Cys(Acm)	25 g
B-25-CT B-100-CT	FMOC-L-Cys(Trt)	25 g 100 g
B-25-EB B-100-EB	FMOC-L-Glu(OtBu)	25 g 100 g
B-25-QT B-100-QT	FMOC-L-Gln(Trt)	25 g 100 g
B-25-G B-100-G	FMOC-L-Gly	25 g 100 g
B-25-HT B-100-HT	FMOC-L-His(Trt)	25 g 100 g
B-25-I B-100-I	FMOC-L-Ile	25 g 100 g
B-25-L B-100-L	FMOC-L-Leu	25 g 100 g
B-25-KBC B-100-KBC	FMOC-L-Lys(Boc)	25 g 100 g
B-25-M B-100-M	FMOC-L-Met	25 g 100 g
B-25-F B-100-F	FMOC-L-Phe	25 g 100 g

CAT. NO.	DESCRIPTION	QUANTITY
B-25-P B-100-P	FMOC-L-Pro	25 g 100 g
B-25-SB B-100-SB	FMOC-L-Ser(tBu)	25 g 100 g
B-25-TB B-100-TB	FMOC-L-Thr(tBu)	25 g 100 g
B-25-W B-100-W	FMOC-L-Trp	25 g 100 g
B-25-WBC	FMOC-L-Trp(Boc)	25 g
B-25-YB B-100-YB	FMOC-L-Tyr(tBu)	25 g 100 g
B-25-V B-100-V	FMOC-L-Val	25 g 100 g

Larger quantities available upon request.

Appendix C

Symphony Accessories/Replacement Parts

CAT. NO.	DESCRIPTION	QUANTITY
	Reaction Vessels:	
SMP-010135	Small Glass Reaction Vessel (9 mL)	1 ea.
SMP-010092	Standard Glass Reaction Vessel (16 mL)	1 ea.
SMP-010134	Large Glass Reaction Vessel (32 mL)	1 ea.
SMP-220056	Cap for Glass Reaction Vessel	1 ea.
SMP-RV-012 SMP-RV-100 SMP-RV-500	Plastic Reaction Vessel (26 mL)	Pkg. of 12 Pkg. of 100 Pkg. of 500
SMP-270054	O-ring, Kalrez, for all Reaction Vessels	1 ea.
SMP-010139	RV Rinse Tube (new style)	1 ea.
SMP-270096	Rinse Tube O-ring	1 ea.
SMP-010141	Safety Shield, Plastic	1 ea.
	Replacement Parts:	
SMP-VX-020 SMP-VX-100	Empty AA Reservoirs & Septa	Pkg. of 20 Pkg. of 100
SMP-270044	Seal, Reagent Reservoir	Pkg. of 20
3100013	Collection Vial (Plastic, Standard)	Pkg. of 50
SMP-LGCLTB	Collection Vial (Glass, Large)	1 ea.
SMP-RF-100	Bottle Filter	Pkg. of 100
SMP-260187	Bottle Filter Housing	1 ea.
SMP-300007	Bottle amber, 0.5 L	1 ea.
SMP-300008	Bottle amber, 1 L	1 ea.
SMP-300002	Bottle amber, 2.5 L	1 ea.
SMP-300004	Bottle amber, 4 L	1 ea.
SMP-260205	Cap for 0.5, 1, 2.5 and 4 L Bottles	1 ea.
PS3-270042	O-ring for 0.5, 1, 2.5, 4 and 20 L Bottles	1 ea.
SMP-350019	Quick-connect, male	1 ea.
SMP-690015	SMC valve	1 ea.
SMP-010105	Vessel Assembly, 20 L	1 ea.
SMP-010106	Vessel Assembly, 12 L	1 ea.

CAT. NO.	DESCRIPTION	QUANTITY
SMP-010096	Waste Tank Assembly	1 ea.
SMP-010103	Waste Spigot Assembly	1 ea.
SMP-260264	Cabinet Floor Tray	1 ea.
SMP-260265	Cabinet Shelf Tray	1 ea.
SMP-010129	**Tools:** Nitrogen Flow Meter	1 ea.
SMP-680018	Vacuum Test Jig	1 ea.
SMP-680019	Pressure Test Jig	1 ea.
SMP-680010	0.125 Lee Tool	1 ea.

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