Molecular Devices

SkanStacker 300

User Guide

AN ALL-INCLUSIVE AUTOMATIC MICROPLATE WASHER

Molecular Devices

1311 Orleans Drive
Sunnyvale, CA 94089 USA

0112-0065 Rev. B

Copyright

© Copyright 2004, Molecular Devices Corporation. All rights reserved. No part of this publication may be photocopied or reproduced in any form without the prior written permission of Molecular Devices Corporation, 1311 Orleans Drive, Sunnyvale, California, 94089, USA.

Trademarks and Patents

SkanWasher is a trademark of Molecular Devices Corporation (MDC) and is not to be used in any type of promotion or advertising without permission from MDC. All other trademarks or registered trademarks are the property of their respective owners.

Disclaimer

Molecular Devices Corporation reserves the right to change its products and services at any time to incorporate technological developments. This user guide is subject to change without notice.

Although this user guide has been prepared with every precaution to ensure accuracy, Molecular Devices Corporation assumes no liability for any errors or omissions, nor for any damages resulting from the application or use of this information.

Table of Contents

Chapter 1: Introduction 1
Overview 1
About This Guide 2
Key to Symbols 2
Safety Features 3
Serial Number 3
Package Content 3

Chapter 2: Installation. 5

Chapter 3: Parts and Description 9
Wash Head. 9
Microplate Lift. 9
Control Panel. 10
LED Display 11
Instrument Rear Connections 11
Pressure/Vacuum Washer Parts. 13
External Vacuum Source. 13
Hydrophobic Filter 13
Internal Pressure Source 13

Chapter 4: Software Configuration. 14
Setup Function. 15
Edit Program 15
Edit Options 21

Chapter 5: Operation. 24
Starting a Wash Program. 24

Chapter 6: Maintenance 26
Daily Maintenance. 26
Empty Wash Head Procedure 27
Weekly Maintenance. 29
Monthly Maintenance 30
Advanced Maintenance 31
Dispense test 31
Clogged Probes 31
Removal of wash head 32

Replacing Probes 33

Chapter 7: Troubleshooting 34
Troubleshooting Chart 34
Error Messages 37
Magazine Alignment 39
Section A: Right magazine alignment 39
Section B: Left magazine alignment 41
Vacuum Pump Troubleshooting 43
Adjusting vacuum pump 43
Discharge test for vacuum pump 44
Compare pump with internal vacuum sensor 44
Application Tips: SkanWasher 300/ SkanStacker 45

Appendix A: Shipment A-1

Appendix B: Specifications B-2
Physical B-2
Performance B-2
Chemical B-2

Appendix C: Warranty C-3

Appendix D: Wash Program Sheets D-5

Index 1-1

Figures

Figure 1: Waste reservoir and vacuum pump. 2-6
Figure 2: Wash and Rinse liquid connection 2-7
Figure 3: Microplate transfer base 2-8
Figure 4: SkanStacker 300 Instrument 3-9
Figure 5: Control Panel, LCD and Touch Keys 3-10
Figure 6: Rear of the SkanStacker 3-11
Figure 7: Aspirate probe height position 4-19
Figure 8: Dispense probe height position. 4-19
Figure 9: Wash head connections. 6-32
Figure 10: Right magazine alignment 7-40
Figure 11: Left magazine alignment 7-42

Chapter 1: Introduction

Overview

The need to thoroughly wash unbound antigens, antibodies, binding proteins, enzymes, or receptors from a solid-phase binding support is one of the most important steps in the enzyme-linked immunosorbent assay (ELISA). The SkanStacker 300 meets this demand and those of other numerous laboratory assays now being performed in 96-well microplates where thorough washing is an essential component of the assay.

The SkanStacker is designed to wash 96-well microplates. The process of setting up wash parameters is flexible and allows you to modify or choose the following settings:

- Aspirate probe height and position in the well for low residual volume.
- Dispense probe height and position in the well for washing the active part of well.
- Inlet wash buffer flow rate can be adjusted by changing air pressure. Range 0.00 - 0.60 bar in selected programs.
- “Overflow” washing with meniscus.
- Microprocessor-controlled timing.
- Aspiration from the top of the well with adjustable lift speed controlled by adjusting aspirate time in seconds.
- Wash all 96 wells simultaneously.
- Dispense-only function from 100 -350 µl.
- Dispense volume adjustment.
- Adjustable vacuum pump with manometer.
- Electronic air pressure regulation.
- Automatic handling of up to 25 microplates.

About This Guide

Chapter 1: This section will give you an introduction to the manual and details of what to expect in this Guide.

Chapter 2: Installation instructions will be outlined.

Chapter 3: Details will be given on unit parts to introduce common terminology used throughout the manual.

Chapter 4: This section will detail use of the software to set up programs and configuration of the instrument.

Chapter 5: General operations will be detailed.

Chapter 6: Detailed procedures will be listed for care and maintenance of instrument.

Chapter 7: Troubleshooting tips, error messages, and advanced troubleshooting will be outlined.

Appendix: This section will include instrument specifications, shipping information, and program sheets.

Key to Symbols

Symbols are used throughout this Guide to indicate important or helpful information that is not directly part of an instruction. The symbols used are the following:

▲ **CAUTION:** Alerts user to situations that could result in instrument damage or failure to complete a procedure.

!! IMPORTANT: Information that you need to know to perform a task properly.

TIP: Helpful information that can simplify a task.

Safety Features

The SkanStacker is equipped with four sensors that help to safeguard operation before the actual wash. When starting the program, the SkanStacker automatically verifies the status of the following:

- Pressure pump operating at the correct level (0-600 mbar).
- Microplate in the microplate lift.
- Space remaining in the waste reservoir (alarm will sound when 3/4 full).
- Waste vacuum operating at the correct level (< 900 mbar).

Sensors can be disabled through the *Setup menu / Edit Options*. Consult page 21 for procedure.

Serial Number

The serial number of the unit can be found on the left side of the instrument.

Package Content

The SkanStacker system includes the following:

- SkanStacker Instrument
- Tool kit, including probe cleaner, Allen key, and 7 mm wrench.
- Power cord: (2) 230 V cables for UK and Europe or (1) 110 V cable
- User guide
- Reference card (short form guide located in slot on back panel of instrument)
- Adjustable feet for leveling instrument
- 2 magazines
- Magazine transfer base
- Aerosol shield
- Warranty card

Reservoir and Tubing

- 45 L/min vacuum pump with hydrophobic filter
- Buffer reservoir (4 L); Rinse reservoir (4 L)
- Waste collection vessel (15 L) with level sensor and alarm waste cable

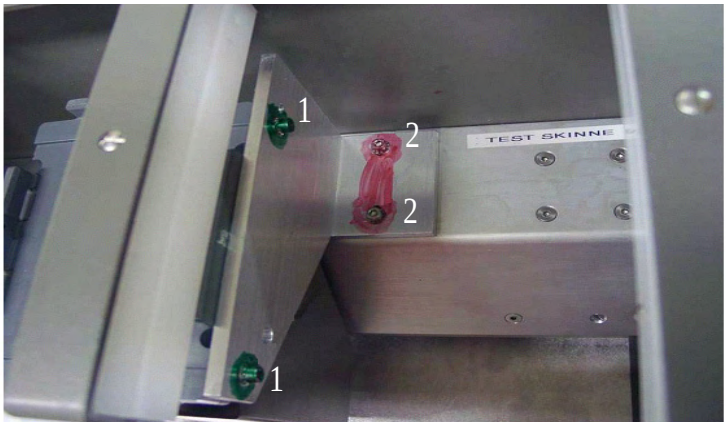
- Tubing set
  - Inlet tubing for buffer (blue) and rinse (green)
  - Pressure tubing (yellow)
  - Vacuum waste tubing (red): connects from instrument to 15 liter collection vessel
  - Vacuum pump tubing (black): connects from vacuum pump to 15 liter collection vessel

Chapter 2: Installation

> **TIP:** Save the packing material for future use in shipping instrument.

Step 1 Remove transport bracket.

- Use an Allen wrench and remove the two allen screws indicated by the number one in the picture below.
- Use an Allen wrench and remove the two allen screws indicated by the number two in the picture below.



Step 2 Verify voltage is properly set for incoming line voltage.

- Check that the current voltage setting is pointing to the small white mark.

> **!! IMPORTANT:** Fuse compartment is located below the main power receptacle on the back of the instrument.

Step 3 Change voltage setting, if indicated.

- Pry open the fuse compartment with a small screwdriver.
- Turn the switch around until the proper setting is pointing to the small white mark on the bottom of the casing.
- Verify correct fuses are in place; change if indicated.
  - 230 VAC= 1A fuse
  - 115 VAC= 2A fuse

- Reinstall switch.

Step 4 Connect the power cord.

> ▲ **CAUTION:** Before connecting the main power, ensure that the voltage setting is correct.

- Insert the power cord into the receptacle located on the back of the instrument.
- Plug the power cord into the main power outlet.

Step 5 Connect Waste Reservoir (refer to Figure 1).

- Connect the outlet tubing line (red) from the **Waste** port on waste reservoir to the **Vacuum** port on the side of the instrument (vacuum grade tubing required with straight-through quick coupling).
- Connect the waste alarm cable from the waste reservoir to the **Waste Alarm** port on the back on the instrument located below the power receptacle.
- Connect vacuum tubing (black) from Vacuum quick connect on waste reservoir to tubing from vacuum pump. (Hydrophobic filter should be connected to tubing from vacuum pump with arrow on filter facing pump.)

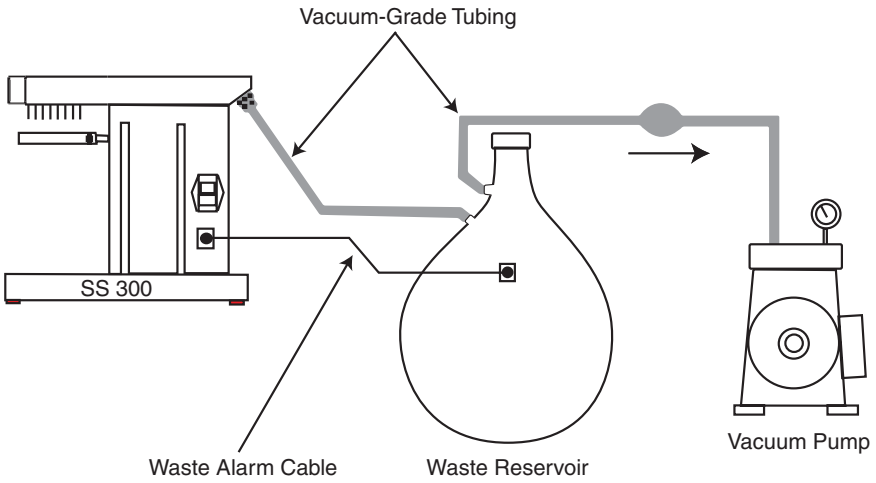


Figure 1: Waste reservoir and vacuum pump

Step 6 Connect the Wash and Rinse Liquids (refer to Figure 2).

> ▲ **CAUTION:** It is recommended to use the waste collection vessel provided by Molecular Devices. These bottles are implosion proof with a "tankful" sensor and a built-in foam reducer.

- Connect the pressure tubing (yellow) from the wash buffer and rinse reservoir to the **Pressure** port on the side of the instrument.
  - Connect the tubing from the wash buffer (blue) and rinse reservoir (green) to the **Inlet** and **Rinse** ports on the left side of the instrument.

> !! **IMPORTANT:** Do not fill the reservoir bottles completely. Allow approximately 25% free space for air pressure.

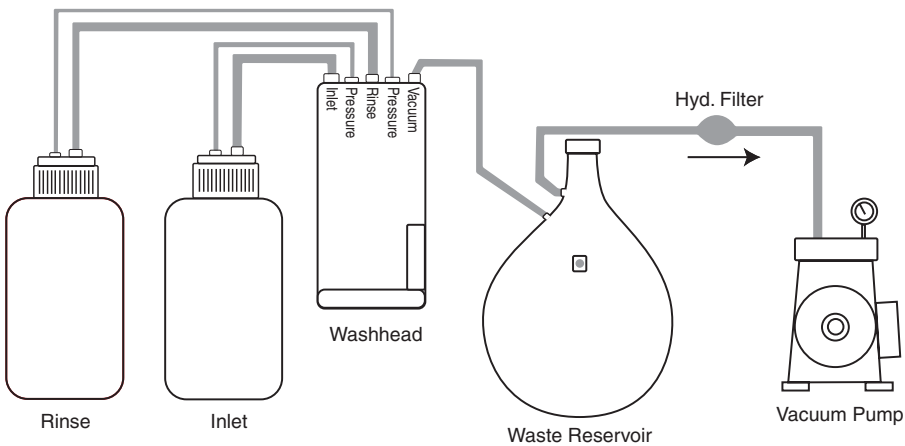


Figure 2: Wash and Rinse liquid connection

Step 7 Load microplates into magazines using the microplate transfer base (see Figure 3).

Step 8 Insert magazines in slots on top of instrument.

Step 9 Set up vacuum pump and adjust if necessary (starting pressure 300 mbar).

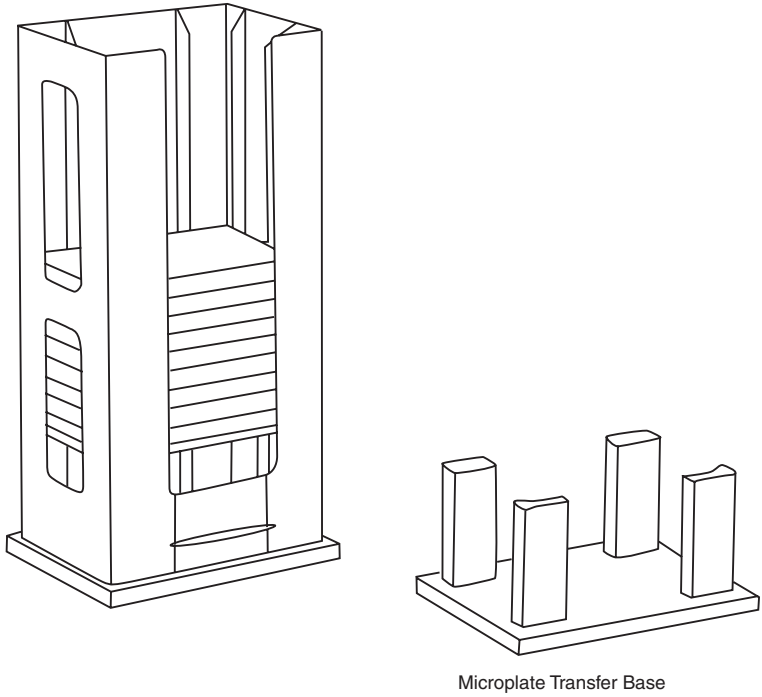


Figure 3: Microplate transfer base

Chapter 3: Parts and Description

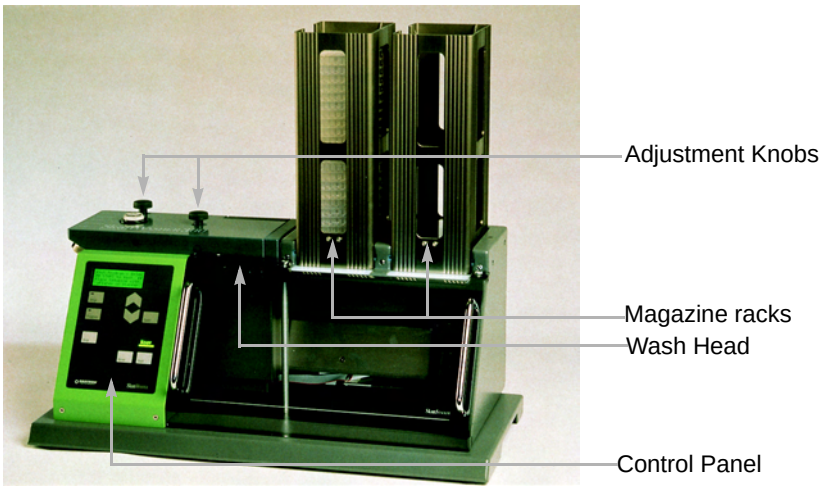


Figure 4: SkanStacker 300 Instrument

Wash Head

- The wash head contains 96 paired probes: the longer probes are used when aspirating and the shorter probes are used when dispensing. The head is a combined manifold and washhead, equipped with 3 valves, electronic sensors for vacuum and pressure, and a spirit level to assist in leveling the wash head.
- The wash head is removable, using the two adjustment knobs to remove the washhead. The washhead is lifted up and both the flat cable and air pressure tubing are disconnected. This allows access to its internal channels for cleaning and maintenance.

Microplate Lift

- The microplate lift ensures that the microplate is positioned accurately during each stage of the wash program. The function of the lift is to minimize contamination of the wash probes (probes are not submerged into the liquid in the wells). The carriage collects and stacks microplates from the magazines.
- The vertical velocity of the lift is fixed except during the aspirate function: the longer the aspirate time, the slower the lift moves

upward toward the aspirate probes. This creates a very gentle aspiration and avoids disturbing the coating in the wells.

- The lift automatically returns to the home position (lower) when the instrument is powered on.

Control Panel

The control panel located on the front of the SkanStacker contains eight touch keys, three LEDs, and a LCD display, all of which are used to program and control the instrument.

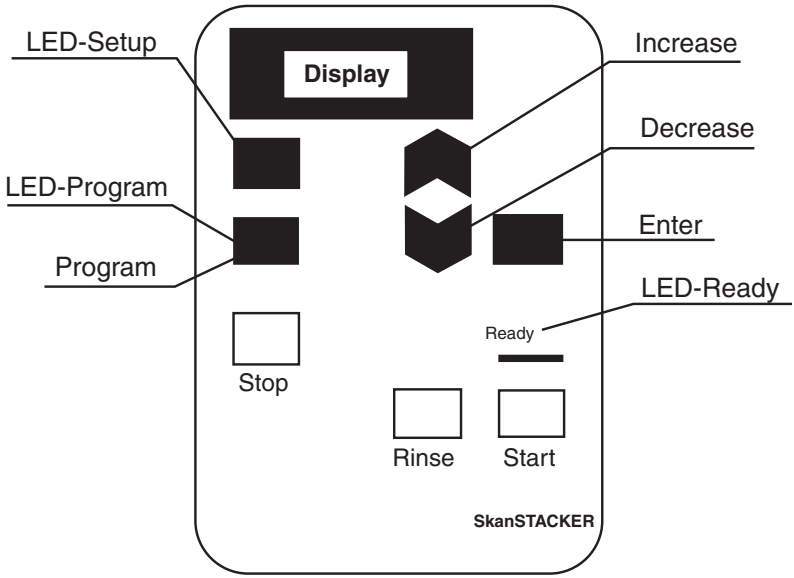


Figure 5: Control Panel, LCD and Touch Keys

The control panel can be divided into three separate parts detailed below:

- LCD Display
  Displays messages during programming, setup, and during a run.
- Setup/Program
  The five dark gray keys ([Setup], [Program], [Enter], and ▲▼ arrow keys) are used to select and enter parameters when programming the SkanStacker. When the [Setup] or [Program] key is pressed, its corresponding LED will light.
- Wash
  - The three light gray keys ([Start], [Rinse], and [Stop]) are used to run a pre-selected wash sequence or rinse or prime. When the

SkanStacker is ready for wash, the **Ready** LED light turns on.

- The [Stop] key is used to halt operation in the event of a problem.
  - Press the [Stop] key to interrupt current operation, and the LCD will display a stop message.
  - Press the [Stop] key a second time to return to the main menu. (The microplate lift will move down to home position.)

LED Display

There are three LEDs that light up indicating various functions:

Setup: LED will light when user is in setup mode.

Program: LED will light when user is in program mode.

Ready: LED will light when unit is ready to run a program.

Instrument Rear Connections

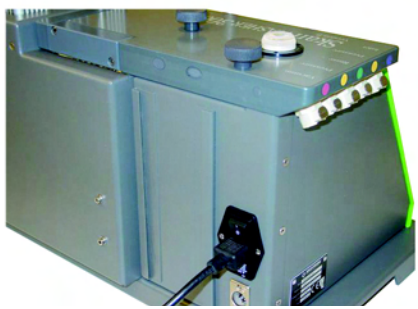


Figure 6: Rear of the SkanStacker

Part	Description
Inlet ports	Located on the left side of the unit's wash head. Two reservoir containers can be connected to the Inlet and Rinse ports. Two 4 L reservoir bottles are provided with the system to accommodate a buffer (blue color-coded tubing) and rinse (green color-coded tubing) solution.
Vacuum port	Located on the left side of the unit. The waste collection reservoir is connected to this port via the waste tubing (red color-coded). It is recommended to use the waste collection vessel that is provided with the system.
Pressure ports	Located on the left side of the unit. The pressure tubing (yellow color-coded) is connected to these ports from the buffer and rinse reservoir bottle.
Main power	Located on the back panel of the unit. This contains the main power receptacle, which includes the power switch and fuses (1 amp for 230 VAC/ 2 amp for 115 VAC). The selected voltage setting (110-130 VAC or 220-240 VAC) will point toward the white arrow. System includes either one power cable to handle 110 V or two power cables to handle 220 V, which includes a power cable for the UK. Consult *Chapter 2: Installation* for directions to change fuses and/or voltage setting.
Waste alarm connector	Located on the back panel of the unit. The waste alarm cable is connected to this port.
Microplate magazines	The instrument is equipped with two (2) microplate magazines that can process up to 25 microplates. A plastic clip at the bottom of the magazine holds the microplates in the magazine. The clips are activated by the microplate carrier during microplate collection and storage operations.

Pressure/Vacuum Washer Parts

External Vacuum Source

The instrument requires an external vacuum source. Vacuum is expressed in millibar (mbar), with reference to absolute vacuum, which equals 0 mbar, and room pressure, which equals 1000 mbar. (Note: 1000 mbar = 1 bar = 1 atmosphere = approximately 14 PSI). The instrument should be used with a stable vacuum source with the following minimum requirements:

- Capacity: Higher than 30 L/min, free air displacement.
- Peak vacuum: Better than 300 mbar.

A dedicated vacuum source is recommended. House vacuum often has fluctuation in vacuum since typically there is more than one user.

Hydrophobic Filter

A hydrophobic filter should be placed between the waste reservoir and vacuum pump. The filter is used to protect the pump by preventing liquid from entering into the pump system. A filter with a pore size of 0.2 µm is recommended. Continuous use of the pump protection membrane filter will cause reduced flow capacity. The filter should be replaced when condensation is visible in its housing.

Internal Pressure Source

The instrument is equipped with an internal pressure pump that creates air pressure in the liquid reservoirs, eliminating the need for gravity feed. The pressure level can be adjusted between 0.0 and 0.6 bar (approximately 9 psi). The air pressure is supplied through the small quick couplings on the left side of the instrument labeled Pressure ports (Figure 2). The default air pressure value is 0.25 bar (approximately 4 psi). Any value between 0.15 -0.40 bar is considered a reasonable operating pressure. The air pressure value can be set for each wash program through the on-board software and adjusted for different assays.

> **TIP:** Adjusting the level of the air pressure also adjusts the flow rate of the liquid entering the microplate wells. It does not have an effect on the volume.

Chapter 4: Software Configuration

The SkanStacker allows up to eight different user-defined and programmed wash sequences to be stored in memory with a battery backup. Each wash program has the following options:

- Air pressure from the internal pressure pump can be varied to control inlet liquid flow.
- Volume adjustment conversion factor, σV, can be used to fine-tune the dispense volume to adjust for the different viscosities of various liquids.
- The position (height) of the aspirate probe above the bottom of the well during aspiration can be varied. The amount of fluid kept in the well can be adjusted.
- Dispense probe height position in the well during washing can be set.
- Up to 16 wash sequence steps can be selected. Each step can be one of the following:
  - Aspirate, time in seconds [2–10 sec.]
  - Wash, time in seconds [0.1–10 sec.]
  - Wash, volume in µl [100–900 µl]
  - Dispense, volume in µl [100–350 µl]
  - Wash from inlet Rinse, time in seconds [0.1–10 sec.]
  - Soak/pause, time in minutes and seconds [1 sec.–2 min 50 sec.]

The washer is pre-programmed with four typical wash sequences. These may be removed or changed as necessary.

At the end of this Guide, a blank program guide sheet is included to facilitate programming. Duplicate this sheet for your own use to save a hard copy of each program for reference purposes.

Setup Function

- The [Setup] key is used to enter and leave the **Setup** window.
  When in Setup mode, the [Setup] key is used to move backward.
  If an error occurs, press the [Setup] key to go back a step.
- The [Enter] key is used to select an item in a list or a value.
- The arrow keys ⮝⮟ are used to place the cursor on an item in a list or to scroll through values. To continue to scroll through values, keep the arrow key depressed.

When pressing the [Setup] key, the Setup Main menu will display two options:

Edit Program A wash program can be edited or created using this selection.

Edit Options Instrument parameters can be viewed and sensor enabled/ disabled.

Edit Program

Step 1 Press [Setup] to enter the Setup window. The Setup LED will illuminate.

Step 2 Select Edit Program.

- Use ⮝⮟ arrow keys to move cursor to selection.
- Press [Enter].

Step 3 Select the program to be edited or select an open space to create a new wash program.

- Use the ⮝⮟ arrow keys to move cursor to selection.
- Press [Enter].

> **!! IMPORTANT:** To save changes, Exit/Save must be selected after program setting completed.

Program Configuration	**Description**
Exit/Save	Use to exit program. User able to save or reject data before exiting.
Name	◆ Program name selected up to 5 characters. ◆ Select each character by using the ⮝⮟ arrow keys. ◆ Press Enter to move to the next character position. ◆ Characters can be capital or lower-case letters, digits, or special characters such as brackets, asterisks, colons, etc. ◆ Delete program by moving ⮝⮟ arrow key to blank space.
Air Pressure	Pressure set for internal air pressure pump. ◆ Set to any value from 0.0 to 0.6 bar (approximately 9 psi). ◆ Pressure is changed to adjust the inlet wash liquid flow. ◆ To disable the pressure pump, select 0.0 bar. ◆ For normal wash, select 0.25 bar (approximately 4 psi).
Volume Adjust	Adjustment can be made to fine tune the dispensed volume using dispense or wash functions. The instrument is set at a default of 1.00 which can handle water and up to 0.02% Tween. If a viscous material is used, increase the dispense volume by increasing the factor (range 0.01 to 2.50).

Program Configuration	**Description**
Stacker Mode	The processing routine between the wash head and the magazines can be selected. ◆ Wash Only: Microplates are collected from the left magazine, washed, and stored in the right magazine. ◆ Restack Only: Microplates are collected from the left magazine and moved to the right magazine. No washing performed. ◆ Restack and Wash: Microplates are collected from the left magazine and stacked into the right magazine. Washing is performed on all plates from the right magazine and restacked into the left magazine. ◆ Wash and Restack: Microplates are collected from the left magazine, washed, and stored in the right magazine. When all plates are processed, the microplates will be restacked to their original position in the left magazine.
Set Wash	Place microplate in left magazine and press [Enter]. Carriage will move microplate under probes. Use ↑↓ arrow keys to adjust probe position in wells. Adjustments made from left to right from a range of +/- 4.1 mm.
Set Aspirate Position	The position of the aspirate probe (longer probe) is adjusted using this setting. ◆ This position is the height above the bottom of the well during aspiration. ◆ Place microplate in left magazine and press [Enter]. Carriage will move microplate under probes. Use ↑↓ arrow keys to set at correct height (see Figure 7). ◆ For low residual volume, the aspirate probe must be close to the bottom of the well. Total adjustable distance is 6 mm.

Program Configuration	**Description**
Set Dispense Position	The position of the dispense probes (shorter probes) is adjusted using this setting. ◆ Place microplate in left magazine and press [Enter]. Carriage will move microplate under probes. Use ↑ ↓ arrow keys to set at correct height (see Figure 8). ◆ Total adjustable distance is 6 mm.
Wash Program 1-16	Up to 16 wash steps can be added. There are seven wash step selections available for each step: Rinse time, Disp volume, Soak / Pause, Wash volume, Wash time, Aspirate, and End Wash. See Table 1 on page 20 for descriptions.

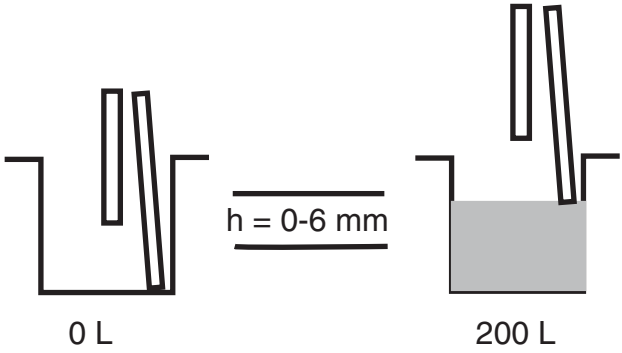


Figure 7: Aspirate probe height position

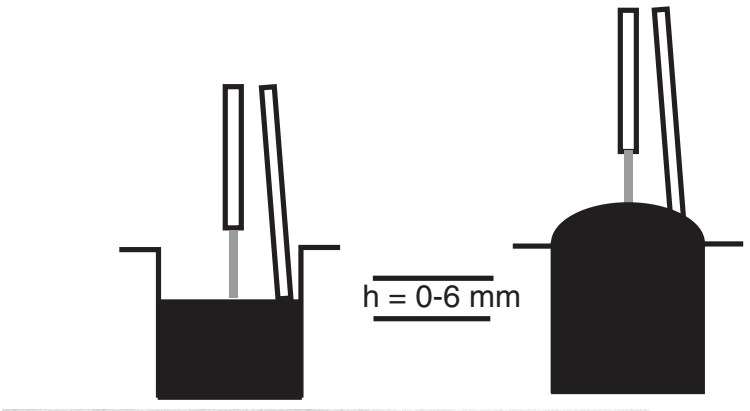


Figure 8: Dispense probe height position

Wash Step Selections

Each program can have up to 16 wash steps. There are seven wash step selections available for each step. Press [Enter] to enter selection, and use ↑↓ arrow keys to change settings. Press [Enter] to select.

Wash Step	Description
Rinse Time	Set time in seconds from 0.1 to 10 seconds. Liquid will be dispensed from “Rinse” port. Fluid is agitated during rinse.
Disp Volume	Set dispense volume from 100-350 µl. Liquid will be dispensed from “Inlet” port.
Soak/Pause	Set soak/pause time from 5 seconds to 2 minutes 50 seconds.
Wash volume	Set volume of wash from 100-900 µl. Liquid will be dispensed from “Inlet” port.
Wash time	Set wash time from 0.1 to 10 seconds. Liquid will be dispensed from “Inlet” port. Fluid is agitated during wash.
Aspirate	Set aspiration time from 2.0 - 10 seconds. Lift velocity is varied with selected aspirate time. The lift velocity is automatically set so that at the last second of the aspiration, the aspirate probes are at the bottom of the well. Aspirate times longer than 5 seconds will have the same lift velocity as the 5-second setting. Aspirate time = 2.0 seconds, lift velocity approximately 1 second. Aspirate time = 5 seconds, lift velocity approximately 4 seconds.
End Wash	Set for last step of wash.

Table 1: Wash Step Selections

> **!! IMPORTANT:** To save changes, Exit/Save must be selected after program setting completed.

Save Program

Step 1 From Edit Program Menu press the Up arrow key and select Exit/ Save.

Step 2 Press [Enter].

Step 3 Press Up-arrow key to select **Yes-Save** at question *Save made changes?*

Step 4 Press [Enter].

> **!! IMPORTANT:** Program will enter this save window if user attempts to exit without saving. If Setup key pressed to return to the Setup Main menu without saving, changes will not be stored in memory.

Edit Options

When selecting Edit Options from the Setup Main Menu, there are six options to choose:

- **Sensor On/Off**
- **Read Sensor**
- **Stacker Sensor (read only)**
- **Set Horizontal Left/Right Position (Set >0< R-mag)**
- **Set Prime/Rinse Left/Right Position (Set >l< P/R)**
- **Test Stacker**

Sensor On/Off

The sensors can be enabled or disabled by selecting this option.

Step 1 Press [Setup] on the Control Panel to enter the Setup Main Menu.

Step 2 Press Down-arrow key to select Edit Options.

Step 3 Press [Enter].

Step 4 Select Sensor On/Off by pressing [Enter].

Step 5 Use Up arrow key to select either *Enabled* or *Disabled.*

Step 6 Press [Enter].

When Sensor is enabled, the following parameters must be valid to start a wash:

- Air pressure must be close to the selected value.
- A microplate must be on the microplate holder.
- The waste reservoir must not be full.
- Waste vacuum must be less than 0.9 bar.

> **!! IMPORTANT:** When sensors disabled, all four safety features will be disengaged.

Read Sensor

Instrument parameters can be verified using this Edit Option. Five sensor values are displayed for read-only purposes. No changes can be made from this screen. The five sensor values are from the following readings

Air Pressure	Value is actual air pressure on internal pressure source displayed in bar. Changes can be made through software program. This sensor can be disabled through Edit Options/Sensor On/Off.
Vacuum	Value is vacuum pressure from vacuum port, displayed in bar. No changes can be made through software program.
µP	This sensor will display “*” instead of microplate lift 0-position. Refer to *Read Stacker Sensors* to obtain status of microplate sensor. This sensor can be disabled through *Edit Options*/Sensor On/Off.
PL	This sensor will display “*” instead of the plate lift 0-position. Refer to *Read Stacker Sensors* to obtain status of plate lift.
WF	Shows the status of the waste level sensor. Displays in (+) or (-). This sensor can be disabled through *Edit Options*/Sensor On/Off.

Read Stacker Sensors

This function is mainly for service personnel. A display of (+) will indicate the sensor is activated; a display of (-) will indicate optical sensor is not activated. There are four optical sensors.

- Checks status of horizontal movement sensor. Carriage is located in the correct position below the right magazine. Displays in (+) or (-).
- Checks status of vertical movement sensor. The vertical lift is located in the lowest position. Displays in (+) or (-).
- Checks release of movement sensor of release arms on the plate carriage. Displays in (+) or (-).
- Checks status of microplate sensor. Senses microplate in microplate holder. Displays in (+) or (-).

Set >0< R-mag (Horizontal Left/Right Position)

This function is used to adjust the magazines to the center of the plate carriage platform. Changes will affect dispense position in all user programs.

Set >1< P/R (Prime/Rinse Left/Right Position)

Adjustment can be made to the position of the wash probes during the Prime/Rinse function. Place microplate in left magazine. Press Enter to move plate under probes. Use ↑↓ arrow key to adjust probes in wells. Range -4.1 to +4.1 mm.

Test Stacker

This function to be used by approved Technical Service Representative. After stacker tested, complete reset of the memory may be necessary resulting in programs reverting back to default factory settings. There are six positions that are tested as well as status of the four optical sensors.

1. Horizontal to Wash Position
2. Horizontal to Right Magazine Position
3. Vertical to Up Position
4. Veridical to Down Position
5. Rel to In Position
6. Rel to Out Position

Chapter 5: Operation

Starting a Wash Program

Step 1 Edit or create wash program using the Edit Program through Setup Main Menu.

Step 2 Verify appropriate liquid is in reservoir bottle.

Step 3 Verify connections.

- Verify reservoir bottles are connected to Inlet and Rinse port and pressurized.
- Verify waste bottle is connected to Waste port.

Step 4 Prime system.

- Place sample microplate in the left magazine.
- Press [Rinse] button to enter prime program.
- Press [Start].
  - Prime program will prime both Rinse and Inlet channels.
- Repeat 3 times.

Step 5 Choose Wash Program.

- Press Program key from control panel (Program LED will illuminate).
- Select a Wash program using the ↑↓ Arrow keys to move cursor to previously created/edited program.
- Press [Enter].

> **TIP:**
>
> - Program mode can be entered only when system is Ready (Ready LED will illuminate).
> - If system is in Setup menu, press [Setup] key to return to Main Menu.
> - To exit the Program mode without selecting a program, press the [Program] key.
> - Use 0.02% Tween (i.e. 0.8 mL in 4L bottle) in wash solution to optimize surface tension and prevent dripping of probes.

Step 6 Place microplate(s) in the left magazine.

Step 7 Press [Start] key.

Step 8 When all microplates are washed, LED Ready light will illuminate.

Step 9 At end of run, run a rinse program using rinse solution (consult *Daily Maintenance*).

Chapter 6: Maintenance

Daily Maintenance

Run daily maintenance (Rinse program) at the end of each run **and** end of day. Decontaminate the instrument, externally and internally, after using infectious materials in the instrument. Commercially available laboratory decontaminants may be used. Follow the manufacturer's directions for proper use.

> ▲ **CAUTION:** Consult chemical resistance chart to verify that decontaminant solution will not harm materials used in the design of the washer.

Step 1 Verify rinse inlet and pressure tubing are connected between the instrument and rinse reservoir bottle (distilled water).

Step 2 Verify waste tubing is connected to vacuum port on instrument.

Step 3 Insert a clean microplate into the left magazine.

Step 4 Press the [Rinse] key to enter the Rinse/Prime mode.

Step 5 Press the [Rinse] key a second time to start the rinse program.

- The rinse program will rinse for 5 seconds and then soak the probe tips for 5 seconds. This cycle is repeated 3 times.
- Press *Stop* to reset the microplate carriage to its home position under the right magazine.

> TIP: When the Rinse program is completed, the probes will be left soaking in liquid. If there is a pause in washing of more than 30 minutes, run this program to prevent sedimentation in the probes.

Step 6 If end of the day, proceed with *Empty Wash Head* Procedure.

Or

If further washing will be performed later the same day, turn instrument off and start new wash with prime.

> ▲ **CAUTION:** Do not leave probes soaking overnight. At end of day, empty wash head.

Empty Wash Head Procedure

Daily maintenance should be performed to remove any buffer from the lines. This will prevent crystallization of salts in the probes or wash head. Rinse system with 20% ETOH solution to deter bacterial and fungal contamination. Follow ETOH solution with a rinse with water. If the unit will not be used for more than a few days, empty the wash head by performing a reverse flush.

Step 1 Verify Daily Maintenance performed.

Always run the rinse program prior to emptying the wash head.

Step 2 Disable sensors.

- Go to Setup Main Menu, select Edit Options, choose Sensor On/Off.
- Disable sensors.

Step 3 Disconnect the waste, inlet, and rinse tubing from the instrument.

Step 4 Verify waste tubing is connected to vacuum port and vacuum pump is on.

Step 5 Insert an empty microplate into the left magazine.

Step 6 Backflush the wash head through **Inlet** port

- Start Prime program.
  - Press the [Rinse] key to enter the Rinse/Prime mode.
  - Press the [Start] key to start the prime program. (This will blow air through the wash head to remove any remaining liquid.)
- Move waste tubing from vacuum port to **Inlet** port just prior to dispensing.
- Repeat 2 times.

Step 7 Backflush the wash head through **Rinse** port

- Start Rinse program.
  - Press the [Rinse] key to enter the Rinse/Prime mode.
  - Press the [Rinse] key a second time to start the rinse program. (This will blow air through the wash head to remove any remaining liquid.)
- Move waste tubing from vacuum port to **Rinse** port just prior to dispensing.
- Repeat 2 times.
- Reconnect waste tubing back to vacuum port.

Step 8 Reconnect tubing.

- Reconnect waste tubing to vacuum port.
- Reconnect liquid and pressure tubing to correct ports.

Step 9 Enable sensors.

- Go to Setup Main Menu, select Edit Options, choose Sensor On/ Off.
- Enable sensors.

Step 10 Instrument may be turned off.

> **!! IMPORTANT:** Prime instrument at next day of use with buffer solution. Follow instructions in *Operation* chapter.

Weekly Maintenance

Perform maintenance once a week or after use of a contaminated solution in instrument to decontaminate system as well as clean probes.

> ▲ **CAUTION:** Consult chemical resistance chart to verify that decontaminant solution will not harm materials used in the design of the washer. Solution that should be avoided: most acids, acetone, anilin, benzene, phosphoric acid, sulfuric acid, xylene, toulene, styrene, and pyridine.

> **!! IMPORTANT:** Perform *Daily Maintenance* before running a decontaminant solution through instrument to rinse out all buffer products.

Step 1 Perform Daily Maintenance to rinse system.

Step 2 Fill a reservoir bottle with 2% bleach solution or other decontaminant solution (20–70% ETOH or an alkali solution of 5–10% NaOH are acceptable).

Step 3 Connect reservoir bottle to instrument.

- Replace Rinse reservoir bottle with bottle filled with decontaminate solution.
- Connect tubing from reservoir bottle to **Rinse** port and pressure tubing to pressure port.
- Verify waste tubing is connected to vacuum port and vacuum pump.

Step 4 Insert a clean microplate into the left magazine.

Step 5 Start Rinse program.

- Press the [Rinse] key to enter the Rinse/Prime mode.
- Press the [Rinse] key a second time to start the rinse program. (The rinse program will rinse for 5 seconds and then soak the probe tips for 5 seconds. This cycle is repeated 3 times.)

Step 6 Soak Probes.

- Press [Stop] key to pause when instrument is in first soak cycle of Rinse program.
- Let probes sit 5 minutes in decontaminant solution.
- Continue Rinse program by pressing [Rinse] key twice.

Step 7 Replace Rinse reservoir bottle with reservoir bottle filled with distilled water.

Step 8 Start Rinse program.

- Press the [Rinse] key to enter the Rinse/Prime mode.
- Press the [Rinse] key a second time to start the rinse program. (The rinse program will rinse for 5 seconds and then soak the probe tips for 5 seconds. This cycle is repeated 3 times.)

Step 9 Repeat Rinse program 3 times.

Step 10 If end of the day, proceed with *Empty Wash Head Procedure*.

Monthly Maintenance

- Check hydrophobic protection filter located between vacuum pump and waste collection vessel.
  - Perform *Adjusting vacuum pump* procedure with and without filter. If any difference in time between these two readings, change hydrophobic filter.
- Check tubing and quick connects for wear and contamination. Replace if indicated.
- Check reservoir bottles.
  - Clean reservoir bottles with decontaminate solution. Flush well with water.
  - Check reservoir bottles for contamination (algae). Replace if indicated.

Advanced Maintenance

Dispense test

Step 1 Set up program for dispense test using the following parameters:

- Aspirate 2 sec
- Wash 350 µl
- Aspirate 2 sec
- Dispense 350 µl
- END

Step 2 Prime system.

Step 3 Run program and inspect dispense levels; note any low volumes.

Step 4 Repeat 3 times.

Step 5 Inspect each well and note if any wells have lower volumes. If low volume consistent with all three dispenses, well must be cleared. Follow procedure for *Clogged Probes*. If inconsistent and lower volume has occurred on any of the three dispenses, perform an *Empty Head Procedure* for a reverse flush of wash head.

Clogged Probes

Probes have the potential of being clogged by small particles from the wash liquid, crystallization, or protein build-up. It is important to perform Daily and Weekly maintenance to keep probes free of debris.

Step 1 Perform Daily Maintenance to rinse system.

Step 2 Perform Weekly Maintenance to clean probes.

Step 3 Clear particles from probes.

- Identify which probe is clogged.
- Use a probe wire to clear the probe.

Step 4 Replace Rinse reservoir bottle with reservoir bottle filled with distilled water.

Step 5 Verify waste tubing is connected to vacuum port and pump is on.

Step 6 Perform a forward flush to remove the particles.

- Insert a clean microplate into the left magazine.
- Press the [Rinse] key to enter the Rinse/Prime mode.
- Press the [Start] key a second time to start the prime program.
- Repeat 3 times.

Step 7 Run a wash program to verify that particles are removed.

Step 8 If particles not removed, consult Technical Support.

Removal of wash head

Step 1 Perform *Empty Wash Head Procedure* to drain wash head.

Step 2 Turn instrument off.

Step 3 Unscrew the wash head locking screws (2).

Step 4 Lift the wash head up slowly. Disconnect the air pressure supply tube and the ribbon cable from the wash head.

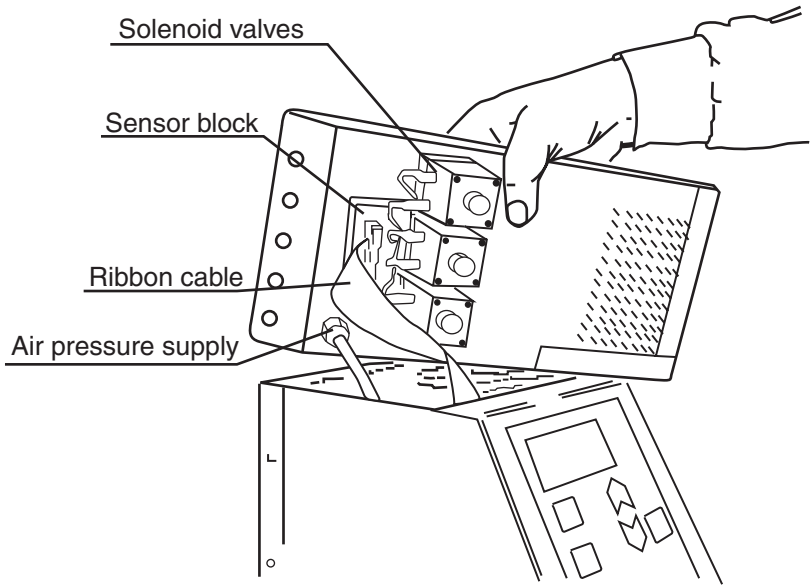


Figure 9: Wash head connections

Replacing Probes

Individual probes can be replaced if identified to be the sole problem.

Step 1 Identify if aspirate or dispense probe is to be replaced.

- Inlet Probe used for dispense probe (part #1700-0190, pkg. 10/box).
- Outlet Probe used for aspirate probe (part #1700-0239, pkg. 10/box).

Step 2 Pull out probe with pliers.

Remove old glue particles from wash head.

Step 3 Insert new probe, burr diameter = 1.10 mm.

- Apply Loctite Activator no.7649 on the mounting area on the probe.
- Push probe in until it is the same length as surrounding probes.

Step 4 Apply glue around probe at the point of entry at the wash head Commercially available glue recommended: Loctite *QuickTite Super Glue Easy Squeeze Gel* or Loctite 290 *Loctite Threadlocker Green* (does not set up as quickly as QuickTite).

Step 5 After 15 minutes, use water to wash excess glue off wash head.

Chapter 7: Troubleshooting

Troubleshooting Chart

If you experience a problem during operation of the SkanStacker and don't know how to resolve it, the following table may prove helpful. Table 2 below lists problems and possible resolutions. For problems not listed here, or if the listed resolution does not fix the problem, please call the Technical Support department at Molecular Devices at 800-635-5577 (outside the U.S. and Canada, please contact your local representative for assistance).

Table 2: Troubleshooting Chart

Problem	Possible Remedies
No power to instrument; instrument will not turn on	• Check that power cord is plugged in. • Check power supply. • Check voltage selection switch. • Check fuses (consult *Chapter2: Installation*).
Air in lines	Prime lines: increase air pressure to 0.5 bar, then press [Rinse] and [Start].
Uneven aspiration	• Clean probes. • Check spacing between ends of probes and bottom of wells. • Adjust microplate alignment if indicated (see page 39).
Coating in wells is damaged after wash.	• Reduce peak vacuum with the regulator on the vacuum pump. • Increase the aspirate times to keep low residual volumes in the well. • Adjust aspiration probe height in wells. Keep away from the bottom of the wells. • Decrease air pressure to prevent damage during dispensing. • Decrease number of wash steps.

Table 2: Troubleshooting Chart

Problem	Possible Remedies
Dripping from aspiration probes	• Increase aspiration time. • Check valves. • Verify instrument level on counter. • Verify vacuum tubing free from restrictions or obstructions.
Clogged aspiration probes	• Use wire probe cleaner. • Soak probes overnight in DI water. • Consult *Clogged Probe* procedure.
Uneven dispenses	• Perform *Clogged Probe* procedure. • Increase air pressure.
Magazine clip won't hold microplate in place.	• Check plastic magazine clip for wear. Replace if indicated. • Magazine should be aligned over plate carriage platform. Consult *Magazine Alignment* procedure.
Dripping from dispense probes	• Check for grime on probes. Perform *Clogged Probe* procedure. • Check wash head. Prime system. • Check amount of Tween, high percentage may cause dripping. Suggested to use <0.025% of Tween in wash fluid.
Programs not retained in instrument memory	Battery on main board may be low: battery life is from three to five years. Test the battery strength to see if it needs to be replaced. Strength should be 3.68 volts ± 5%. Replace battery with Lithium battery ER6/3 6V. Replacement should be performed by a qualified service representative.
Pump continues to run	Remove tubing from side of washer at pressure fitting. If pump stops, the problem is probably the tubing caps. If the pump continues running, it is most likely another internal problem. Call Technical Support.

Table 2: Troubleshooting Chart

Problem	**Possible Remedies**
Plate carriage will not operate	Verify there is no obstruction on the plate carriage.
Plate dropping from magazine.	• Check plastic magazine clip for wear. Replace if indicated. • Magazine should be aligned over plate carriage platform. Consult *Magazine Alignment* procedure.
Carriage hitting the rail. Grinding sound heard after [Stop] button pressed.	Sensor for positioning plate carriage needs to be aligned. Call Technical Support.

Error Messages

When an error condition occurs, the SkanStacker 300 stops operation and an alarm signal is heard. The LED Ready light flashes and a message is shown in the display.

The sensor check is performed once when the [Start] key is pressed to initiate a wash. During the wash, the SkanStacker 300 does not check the sensors.

Error	Cause	Things to Try
E-01 Bad Vacuum	Low vacuum at the vacuum outlet when starting wash.(Vacuum must be less than 900 mbar).	• Verify vacuum pump is switched on. • Verify tubing connected properly. • Verify caps on reservoir bottles and waste collection vessel are tight. • Verify vacuum tubing free from restrictions or obstructions. • Verify pump protection filter is not closed or filled with fluid.
E-02 Air Pressure Pressure High ⮝⮟ Low ➢ Verify Setup	The [Start] key is pressed for wash or rinse/prime. The actual air pressure is not equal to the set air pressure value.	**Low:** Probably a leak. Check that all reservoir caps are tightened. **High:** Due to changed air pressure setting. The previously used wash program had a higher air pressure setting. Open reservoir cap to release excess air pressure.
E-03 MicroPlate No Plate In Lift ➢➢ Insert Plate	The [Start] key has been pressed for wash or rinse/prime but no microplate is in the plate holder.	Insert a microplate.

Error	Cause	Things to Try
E-04 Waste Full Waste Reservoir ➢➢ Empty Waste	The [Start] key has been pressed for wash or rinse/prime, but the waste reservoir is full.	• Empty the waste reservoir to continue. • Press the [Stop] key to return from the Error position.
E-08 Plate move-no store* Right mag >>Check Plate Carr OR No store* Left mag	Horizontal obstruction in plate path from magazines.(After plate washing, movement to right magazine failed.)	• Verify correct microplate is in use. • Verify microplate holder is in correct position. Alignment must be performed by Trained service Technician. Call Technical Support. • Inspect magazine clip. • Check horizontal position of the carriage through Setup Menu and Edit options (Set Horizontal >0< R-mag).

Magazine Alignment

Determine which magazine needs to be aligned over the plate carriage. Typical symptom is magazine dropping microplates. If the right magazine needs alignment, proceed to Section A. If the left magazine needs alignment, proceed to Section B.

Section A: Right magazine alignment

Step 1 Place empty magazines on platform.

Step 2 Test Horizontal Left/Right positioning through Edit Options.

- Press [Setup] on the Control Panel to enter the Setup Main Menu.
- Use ↖↗ arrow keys to move cursor to Edit Options.
- Press [Enter].
- Select >0< R-mag (Horizontal Left/Right positioning).
- Press [Enter] to move plate carriage platform under the right magazine and up to collect plate (no plate should be in the magazine at this time).

Step 3 Adjust left to right placement using ↖↗ arrow keys.

Step 4 Adjust magazine to center of plate carriage platform (see Figure 10).

- Loosen screws on top of the casing located to the right of the magazine.
- Loosen screws in the front and back of casing. Use screws to adjust the magazine to the center of the plate carriage platform (see Figure 10).
- When tightening the screw in back of casing, the magazine will move toward the back of instrument.
- When tightening the screw in the front of the casing, the magazine will move toward the front of the instrument.
- Tighten screw on the top of the casing.
- Press [Enter] to exit program.
- Press [Setup] [Setup] to return to main menu.

Step 5 Set up a program and test five microplates through the cycle of wash and restack. Re-adjust if indicated.

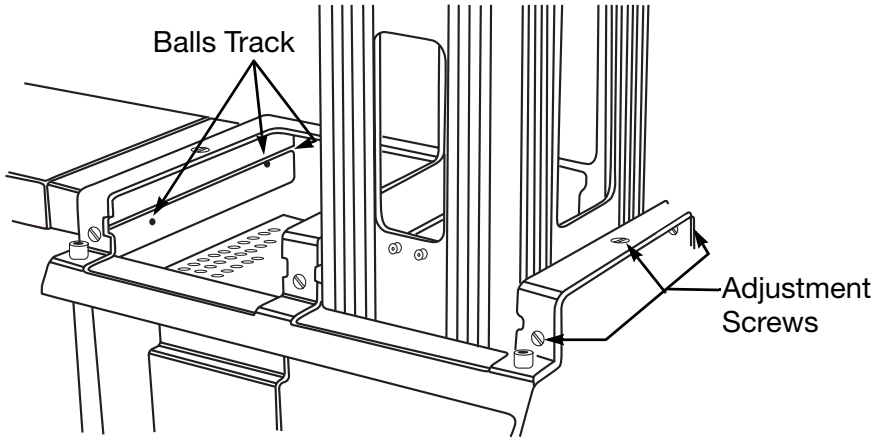


Figure 10: Right magazine alignment

Section B: Left magazine alignment

Step 1 Place empty magazines on platform.

Step 2 Test Prime/Rinse positioning through Edit Options.

- Press [Setup] on the Control Panel to enter the Setup Main Menu.
- Use ↑ ↓ arrow keys to move cursor to Edit Options.
- Press [Enter].
- Select >1< P/R (Prime/Rinse positioning).
- Press [Enter] [Enter] to move plate carriage platform under the left magazine and up to collect plate (no plate should be in the magazine at this time).
- The plate carriage will go up to pick up plate; as it goes down, press [Stop].

Step 3 Adjust magazine to center of plate carriage platform (see Figure 10).

- Loosen screws on top of the casing located to the left of the magazine.
- Loosen screws in the front and back of casing. Use screws to adjust the magazine to the center of the plate carriage platform (see Figure 11).
- When tightening the screw in back of casing, the magazine will move toward the back of instrument.
- When tightening the screw in the front of the casing, the magazine will move toward the front of the instrument.
- Tighten screw on the top of the casing.
- Press [Stop] to reset.
- Press [Setup] [Setup] to return to main menu.

Step 4 Set up a program and test five microplates through the cycle of wash and restack. Re-adjust if indicated.

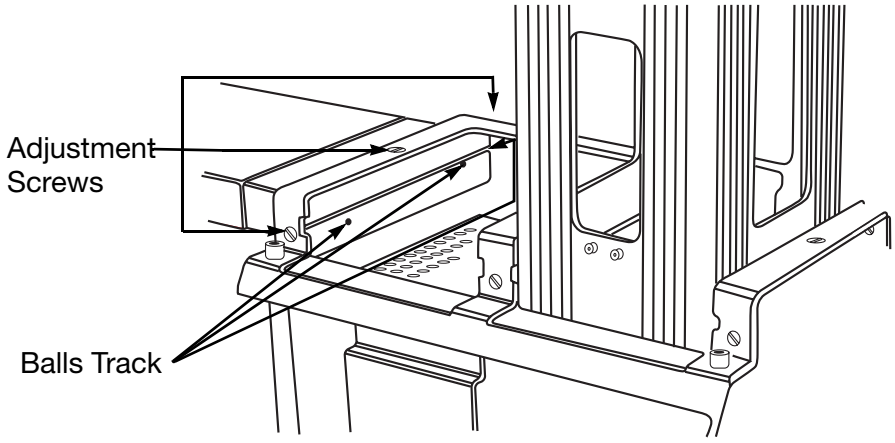


Figure 11: Left magazine alignment

Vacuum Pump Troubleshooting

Adjusting vacuum pump

Step 1 Start pump with only the vacuum line inserted to pump.

- If hydrophobic filter installed, make sure the ventilation hole is covered.
- Turn manometer clockwise to close the regulator.
- Start the pump. Air should be flowing freely and the manometer should read 950-1000 mbar.

Step 2 Close vacuum tubing by putting your finger over the opening. Vacuum should reach a level of 50-100 mbar.

Step 3 Open manometer regulator screw about half a turn. The peak vacuum will be reduced a few millibars, but this prevents condensation in the pump.

Step 4 Connect the empty 15-L waste collection vessel to vacuum pump and washer.

Step 5 Test the vacuum system performance. Record the reading from the manometer at 30 seconds, 60 seconds, 120 seconds, and at 3-4 minutes. The expected performance (+/- 10%) is as follows:

- With a start value of 1000 mbar, reading after 30 seconds should be 500 mbar.
- With a start value of 1000 mbar, reading after 60 seconds should be 300 mbar.
- With a start value of 1000 mbar, reading after 120 seconds should be 200 mbar.
- With a start value of 1000 mbar, reading after a few minutes should be 100 mbar.

Step 6 Evaluate system if performance not met. Rule out leaks in the system and/or build-up of condensed particles in filter. Repeat test if indicated.

Discharge test for vacuum pump

Step 1 Turn vacuum pump on with all tubing attached to instrument. Run pump between 50-150 mbar.

Step 2 Disconnect vacuum tubing from washer.

Step 3 Observe reading on vacuum pump manometer. Reading should drop to 950-1000 mbar in less than 10 seconds.

Step 4 If test failed, check for obstruction.

Compare pump with internal vacuum sensor

Step 1 Go to Setup Menu/Edit Options/Read Sensor.

Step 2 Record the internal vacuum sensor reading.

Step 3 Record the pump gauge reading.

Step 4 Compare two readings. If the readings are not the same, check for leaks or blockage in the vacuum system.

Application Tips: SkanWasher 300/ SkanStacker

Instrument Functions

Air Pressure

- Internal pressure pump creates air pressure within the liquid reservoir.
- Air pressure increases the flow rate and has no effect on volume.
- **Increase the air pressure for higher pressure, decrease for lower pressure.**
- Internal pressure pump adjusted through *Edit Program* through the *Setup Menu*.

Vacuum pressure

- Vacuum pressure is regulated from pump gauge.
- Vacuum pressure determines the rate of aspiration.
- **Increasing the vacuum pressure value decreases the vacuum.**
- To convert mm Hg to mbar pressure, consult conversion table at web site: http://www.info@speckdesign.com.

Suggested setting

These values are suggested as a starting point for your assay. **Test between adjustments to optimize air and vacuum pressure for each specific assay.**

	External	**Software Setting**	
Applications	**Vacuum pressure setting at pump**	**Air Pressure Range 0.0-0.6 bar (*Edit Program)***	**Set Aspirate Position Range 0-6 mm (*Edit Program)***
ELISA and adherent cells	250 mbar	0.25 bar	0-2 mm (0=bottom of plate)
Cells	350 mbar	0.15-0.20 bar	2-4 mm

Troubleshooting Tips

Problem	Things to Try
Cells are aspirated off the bottom of the wells.	Decrease vacuum pressure at pump by increasing value. Optimize cell assay with vacuum pressure of 350-450 mbar.
	Cells are being disrupted during dispensing. Lower air pressure by decreasing air pressure value in software through *Edit Program*.
	Check Aspirate position in *Edit Program* from the *Setup Menu* in the software. Reset height of aspiration probes. For low residual volume, the aspirate probe must be close to the bottom of the well.
	Check Dispense position in *Edit Program* from the *Setup Menu* in the software. Reset height of dispense probes.
Residual volume too high or low.	Check vacuum pressure. Pressure setting of 250 mbar is suggested for ELISA applications. Increasing the value decreases the vacuum pressure, which slows the aspiration rate. Use a slower aspiration rate when working with cells.
	Check Aspirate position in *Edit Program* from the *Setup Menu* in the software. Reset height of aspiration probes. For low residual volume, the aspirate probe must be close to the bottom and side of the well.
	If residual volume too low, check also for clogged probes. Is volume low in certain wells?

Appendix A: Shipment

Prior to transporting the SkanStacker, carry out the following steps.

Step 1 Decontaminate the system following *Weekly Maintenance* procedure. If radioactive materials are used, use appropriate decontaminate solution for each material.

Step 2 Perform *Empty Head* procedure to empty dispense head of all fluid.

Step 3 Clean exterior surface of instrument with alcohol followed by water.

Step 4 Remove the magazines.

Step 5 Secure the wash head and plate carriage using foam and tape. Install transport bracket on rail (see page 5).

Step 6 Complete and sign the decontamination form.

Step 7 Ship in the original packaging material and cardboard box.

> **!! IMPORTANT:** Original packaging must be used. If unavailable, obtain packaging from Molecular Devices.

Appendix B: Specifications

Physical

- Dimensions
  - Length . . . . . 66 cm
  - Width. . . . . 34 cm
  - Height . . . . . 58 cm
- Weight . . . . . 19 kg
- Shipping weight. . . . . 35.5 kg
- Shipping dimensions . . . . . 88 cm (L) x 48 CM (W) x 96 cm (H)
- Power source . . . . . 110/230 VAC ± 10%, 50/60 Hz
- Setup memory . . . . . Lithium battery, 8 wash programs + instrument parameters
- Pumps . . . . . Internal pressure pump
- Fuse . . . . . Two 2 amp, slow blow (110V)
Two 1 amp, slow blow (230V)
- Internal pressure . . . . . Membrane air pump, 0-600 mbar
Electronic regulation
- Microplate carriage . . . . . Step motor driven
- Magazine capacity. . . . . 25 microplates

Performance

- Aspirate . . . . . < 5 µl average residual volume/well
- Dispense
  - Accuracy . . . . . < 4% CV at 350 µl
  - Volume . . . . . 100-350 µl
- Internal volume . . . . . Wash head prime volume < 35 mL
- Well flow rate (Room temperature water and 0.2% Tween)
  - At air pressure 0.25 bar. . . . Typical flow rate 260 µl/s
  - At air pressure 0.50 bar. . . . Typical flow rate 430 µl/s

Chemical

- Housing . . . . . Painted, marine-grade aluminum
- Microplate magazines . . . . . Anodized, marine-grade aluminum
- Wash elements. . . . . Stainless steel probes
- Wash head . . . . . PVC
- Valve . . . . . Viton-membrane, solenoid operated
- Inlet/outlet/pressure ports . . . . . Polypropylene quick disconnect,
Viton O-rings

Appendix C: Warranty

Molecular Devices Corporation warrants this product against defects in material or workmanship as follows:

- All parts of the SkanStacker are warranted for a period of one(1) year from the original date of delivery.
- All labor charges to repair the product for a period of one (1) year from the original date of delivery will be paid by Molecular Devices Corporation.
- This warranty covers the SkanStacker system only and does not extend to any computer, printer, reagents, disposables, or additional software used with this system.

Labor and Parts

To obtain warranty service during the applicable warranty period, you must take the product or deliver the product properly packaged in the original shipping materials and carton to an authorized Molecular Devices Corporation service facility. You must call or write to the nearest Molecular Devices Corporation service facility to schedule warranty service. You may call Molecular Devices Corporation at the telephone number or address below to locate the nearest service facility. At the time of requesting warranty service, you must present proof of purchase documentation which includes the date of purchase, and Molecular Devices Corporation must have the Warranty Registration form completed, signed, and returned by you within ten (10) working days of the date of delivery.

T**his warranty covers only defects arising under normal usage and does not cover malfunctions or failures from misuse, abuse, neglect, alterations, modifications, or repairs by other than an authorized Molecular Devices Corporation service facility.**

Repair or replacement as provided under this warranty is the exclusive remedy to the purchaser (the “Buyer”). Molecular Devices Corporation (the “Seller”) shall not be liable for any incidental or consequential damages for breach of any express or implied warranty on this product, except to the extent required by applicable law. The Seller specifically excludes all express and implies warranties including without limitation any implied warranty that the products sold under this agreement are merchantable or are fit for any particular purpose, except such warranties expressly identified as warranties and set forth for any particular purpose, except such warranties expressly identified as warranties and set forth in the Seller’s current user guide, catalog, or written guarantee covering such product. The Seller also makes no warranty that the

products sold under this agreement are delivered free of the rightful claim of any third party by way of patent infringement or the like. If the Buyer furnishes specifications to the Seller, the Buyer agrees to hold the Seller harmless against any claim that arises out of compliance with the specifications.

Any description of the products contained in this agreement is for the sole purpose of identifying them. Any such description is not part of the basis of the bargain and does not constitute a warranty that the products shall conform to that description. Any sample or model used in connection with this agreement is for illustrative purposes only, is not part of the basis of the bargain, and is not to be construed as a warranty that the products will conform to the sample or model. No affirmation of fact or promise made by the Seller, whether or not in this agreement, shall constitute a warranty that the products will conform to the affirmation or the promise.

For the name of the nearest authorized Molecular Devices Corporation service facility, please contact Molecular Devices at one of the following telephone numbers:

408-747-1700

800-735-5577 (US & Canada)

Appendix D: Wash Program Sheets

SkanStacker 300 Wash Program Sheet

Program 1

Wash programs are pre-set at the factory. These programs may be edited.

Program Number	1	Program Name	A + 3 * W
Date	09.10.1998	Signature	/TB

Description: Demo program

Wash: Aspirate followed by 3 times wash.

Stacker: Wash Only–microplates will be in right magazine when ready.
Note: Adjust probe position before using program.

Instrument Parameters

Stacker Mode	■ Wash Only ☐ Wash & ReStack ☐ ReStack & Wash ☐ ReStack Only		
Air Pressure	0.25 [bar]	Volume Adjust σV	1.00 [-]
Wash➢|≺Probe	[mm]	Aspirate Probe	[mm]
Dispense Probe	[mm]	Hor ➢0≺position	0.0 [mm]

Wash Sequence

1. Wash Step	■ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse 2.0 sec/____ µl
2. Wash Step	☐ Aspirate ■ Wash ☐ Dispense ☐ Soak ☐ Rinse 1.5 sec/____ µl
3. Wash Step	■ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse 2.0 sec/____ µl
4. Wash Step	☐ Aspirate ■ Wash ☐ Dispense ☐ Soak ☐ Rinse 1.5 sec/____ µl
5. Wash Step	■ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse 2.0 sec/____ µl
6. Wash Step	☐ Aspirate ■ Wash ☐ Dispense ☐ Soak ☐ Rinse 1.5 sec/____ µl
7. Wash Step	■ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse 4.0 sec/____ µl
8. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
9. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
10. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
11. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
12. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
13. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
14. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
15. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
16. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl

SkanStacker 300 Wash Program Sheet

Program 2

Wash programs are pre-set at the factory. These programs may be edited.

Program Number	**2**	**Program Name**	**A + 4 * W**
Date	**09.10.1998**	**Signature**	**/TB**
Description:	Demo program		
Wash: Aspirate followed by 4 times wash volume = 250 µL.			
Stacker: Wash & ReStack–microplates will be in left magazine when ready. **Note: Adjust probe position before using program.**			

Instrument Parameters

Stacker Mode	☐ Wash Only ■ Wash & ReStack ☐ ReStack & Wash ☐ ReStack Only		
Air Pressure	0.25 [bar]	**Volume Adjust σV**	1.00 [-]
Wash➢|≺Probe	[mm]	**Aspirate Probe**	[mm]
Dispense Probe	[mm]	**Hor ➢0≺position**	0.0 [mm]

Wash Sequence

1. Wash Step	■ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse 2.0 sec/____ µl
2. Wash Step	☐ Aspirate ■ Wash ☐ Dispense ☐ Soak ☐ Rinse ___ sec/ 250 µl
3. Wash Step	■ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse 2.0 sec/____ µl
4. Wash Step	☐ Aspirate ■ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/ 250 µl
5. Wash Step	■ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse 2.0 sec/____ µl
6. Wash Step	☐ Aspirate ■ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/ 250 µl
7. Wash Step	■ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse 2.0 sec/____ µl
8. Wash Step	☐ Aspirate ■ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/ 250 µl
9. Wash Step	■ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse 4.0 sec/____ µl
10. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
11. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
12. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
13. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
14. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
15. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
16. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl

SkanStacker 300 Wash Program Sheet

Program 3

Wash programs are pre-set at the factory. These programs may be edited.

Program Number	**3**	**Program Name**	**A 2 W S A**
Date	**09.10.1998**	**Signature**	**/TB**

Description: Demo wash program

Wash: Aspirate followed by 2 times wash, soak for 5 seconds then finally an aspirate.

Stacker: ReStack & Wash –microplates will be in left magazine when ready.
Note: Adjust probe position before using program.

Instrument Parameters

Stacker Mode	☐ Wash Only ☐ Wash & ReStack ■ ReStack & Wash ☐ ReStack Only		
Air Pressure	0.25 [bar]	**Volume Adjust σV**	1.00 [-]
Wash➢|≺Probe	[mm]	**Aspirate Probe**	[mm]
Dispense Probe	[mm]	**Hor ➢0≺position**	0.0 [mm]

Wash Sequence

1. Wash Step	■ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse 2.0 sec/____ µl
2. Wash Step	☐ Aspirate ■ Wash ☐ Dispense ☐ Soak ☐ Rinse 1.0 sec/____ µl
3. Wash Step	■ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse 2.0 sec/____ µl
4. Wash Step	☐ Aspirate ☐ Wash ■ Dispense ☐ Soak ☐ Rinse _____ sec/ 200 µl
5. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ■ Soak ☐ Rinse 5.0 sec/____ µl
6. Wash Step	■ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse 4.0 sec/____ µl
7. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
8. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
9. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
10. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
11. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
12. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
13. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
14. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
15. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
16. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl

SkanStacker 300 Wash Program Sheet

Program 4

Wash programs are pre-set at the factory. These programs may be edited.

Program Number	**4**	**Program Name**	**D - V 2 5**
Date	**09.10.1998**	**Signature**	**/TB**

Description: Demo wash program

Aspirate followed by Dispense 200 µL.

Stacker: Wash & ReStack–microplates will be in left magazine when ready.
Note: Adjust probe position before using program.

Instrument Parameters

Stacker Mode	☐ Wash Only ■ Wash & ReStack ☐ ReStack & Wash ☐ ReStack Only		
Air Pressure	0.25 [bar]	**Volume Adjust σV**	1.00 [-]
Wash➢|≺Probe	[mm]	**Aspirate Probe**	[mm]
Dispense Probe	[mm]	**Hor ➢0≺position**	0.0 [mm]

Wash Sequence

1. Wash Step	■ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse 2.0 sec/____ µl
2. Wash Step	☐ Aspirate ☐ Wash ■ Dispense ☐ Soak ☐ Rinse _____ sec/ 200 µl
3. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
4. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
5. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
6. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
7. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
8. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
9. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
10. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
11. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
12. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
13. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
14. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
15. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
16. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl

SkanStacker 300 Wash Program Sheet

Program 5

Wash programs are pre-set at the factory. These programs may be edited.

Program Number	**5**	**Program Name**	**D - V 5 0**
Date	**09.10.1998**	**Signature**	**/TB**

Description: Demo wash program

Aspirate followed by Dispense 200 µL.

Stacker: Wash Only–microplates will be in right magazine when ready.
Note: Adjust probe position before using program.

Instrument Parameters

Stacker Mode	■ Wash Only ☐ Wash & ReStack ☐ ReStack & Wash ☐ ReStack Only		
Air Pressure	0.25 [bar]	**Volume Adjust σV**	1.00 [-]
Wash➢|≺Probe	[mm]	**Aspirate Probe**	[mm]
Dispense Probe	[mm]	**Hor ➢0≺position**	0.0 [mm]

Wash Sequence

1. Wash Step	■ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse 2.0 sec/____ µl
2. Wash Step	☐ Aspirate ☐ Wash ■ Dispense ☐ Soak ☐ Rinse _____ sec/ 200 µl
3. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
4. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
5. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
6. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
7. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
8. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
9. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
10. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
11. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
12. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
13. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
14. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
15. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
16. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl

SkanStacker 300 Wash Program Sheet

Program 6

Wash programs are pre-set at the factory. These programs may be edited.

Program Number	**6**	**Program Name**	**D + A S P**
Date	**09.10.1998**	**Signature**	**/TB**

Description: Demo wash program

Wash followed by Aspirate.

Stacker: Wash Only–microplates will be in right magazine when ready.
Note: Adjust probe position before using program.

Instrument Parameters

Stacker Mode	■ Wash Only ☐ Wash & ReStack ☐ ReStack & Wash ☐ ReStack Only		
Air Pressure	0.25 [bar]	**Volume Adjust σV**	1.00 [-]
Wash➢|≺Probe	[mm]	**Aspirate Probe**	[mm]
Dispense Probe	[mm]	**Hor ➢0≺position**	0.0 [mm]

Wash Sequence

1. Wash Step	☐ Aspirate ■ Wash ☐ Dispense ☐ Soak ☐ Rinse 3.0 sec/____ µl
2. Wash Step	■ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse 4.0 sec/____ µl
3. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
4. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
5. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
6. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
7. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
8. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
9. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
10. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
11. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
12. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
13. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
14. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
15. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
16. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl

SkanStacker 300 Wash Program Sheet

Program 7

Wash programs are pre-set at the factory. These programs may be edited.

Program Number	**7**	**Program Name**	**R E S T K**
Date	**09.10.1998**	**Signature**	**/TB**
Description:	Demo wash program		
Stacker: ReStack Only.			

Instrument Parameters

Stacker Mode	☐ Wash Only ☐ Wash & ReStack ☐ ReStack & Wash ■ ReStack Only		
Air Pressure	0.25 [bar]	**Volume Adjust σV**	1.00 [-]
Wash➢|➢Probe	[mm]	**Aspirate Probe**	[mm]
Dispense Probe	[mm]	**Hor ➢0➢position**	0.0 [mm]

Wash Sequence

1. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ■ Soak ☐ Rinse 1.0 sec/____ µl
2. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____sec/____ µl
3. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
4. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
5. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
6. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
7. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
8. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
9. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
10. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
11. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
12. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
13. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
14. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
15. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
16. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl

SkanStacker 300 Wash Program Sheet

Program Number		**Program Name**	
Date	**09.10.1998**	**Signature**	

Description:

Instrument Parameters

Stacker Mode	☐ Wash Only ☐ Wash & ReStack ☐ ReStack & Wash ☐ ReStack Only		
Air Pressure	0.25 [bar]	**Volume Adjust σV**	1.00 [-]
Wash➢|≺Probe	[mm]	**Aspirate Probe**	[mm]
Dispense Probe	[mm]	**Hor ➢0≺position**	0.0 [mm]

Wash Sequence

1. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
2. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
3. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
4. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
5. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
6. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
7. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
8. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
9. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
10. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
11. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
12. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
13. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
14. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
15. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl
16. Wash Step	☐ Aspirate ☐ Wash ☐ Dispense ☐ Soak ☐ Rinse _____ sec/____ µl

Index

A

Advanced maintenance 31
Alert symbols 2
Application tips 45
Application tips, troubleshooting 46
Aspirate 10, 17, 20

C

Connections 11
Control panel 10
    keys
        Aspirate 10
        Enter 10
        Program 10
        Start 10
        Stop 10

D

Daily maintenance 26
Decontamination 26, 29
Dispense 18

E

Edit Options 15, 21
Edit Program 15
ELISA setting 45
Empty Wash Head Procedure 27
Enter (key) 10
Error messages 37

F

Filter for waste reservoir 6
Filter, waste 13

H

Home position (microplate lift) 10
Hydrophobic filter 13

I

Inlet port 7, 12
Installation 5

L

LCD display 10
LED display 11

M

Magazine alignment 39– 42
Main power 12
Maintenance 26
    advanced 31
    daily 26
    weekly 29
Memory 14
Microplate lift 9
    home position 10
Microplate transfer base 8

O

Operation 24

P

Pressure port 7, 12
Pressure pump 13, 16
Pressure, port from wash reservoir 7
Probes
    alignment 17, 18

replacement 33
Program (key) 10

R

Read Sensor 22, 23
Ready LED 11
Replacing probes 33
Rinse key 10
Rinse port 7
Rinse time 20

S

Safety features 3
Serial number 3
Settings overview 1
Setup function 15
Setup key 10
Shipment A-1
Soak 20
Software 14
Specifications B-2
Stacker mode 17
Stacker sensors 23
Stacker test 23
Start (key) 10
Stop (key) 10
Stop key 11
System contents 3

T

Troubleshooting 34
advanced 37
Tween 24

V

Vacuum port 6
Vacuum pump 13, 43– 44, 45
Voltage setting 5
Volume adjustment 16

W

Warranty C-3
Wash 10
inlet port 7
rinse port 7
Wash head 9
Wash head removal 32
Wash parameters, overview 1
Wash program 24
Wash program sheets D-5
Waste
alarm 6
connecting the reservoir 6
filter 6
outlet port 6
pressure port 7
vacuum port 6
Waste alarm connector 12
Weekly maintenance 29