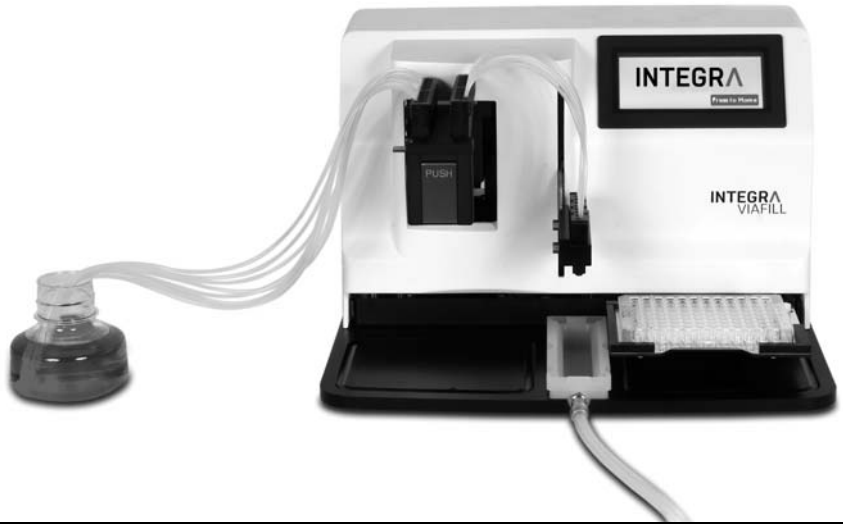
INTEGRA




**VIAFILL** Operating instructions

900-00006-00-V02

INTEGRA

CE

**Declaration of conformity | Konformitätserklärung | Déclaration de conformité | Declaración de conformidad | Dichiarazione di conformità**

**INTEGRA Biosciences – 2 Wentworth Drive, Hudson, New Hampshire 03051**

declares on its own responsibility that the product | erklärt in alleiniger Verantwortung, dass das Produkt | déclare sous sa responsabilité exclusive, que le produit | declara bajo su propia responsabilidad que el producto | dichiara sotto la propria responsabilità che il prodotto

| | |
|---|---|
| **VIAFILL Dispenser** | **Model: 5600** |
| **VIAFILL Plate Stacker** | **Model: 5910** |

in accordance with EC directives | gemäss der EU-Richtlinien | est conforme au terme de la directives CE | de acuerdo con las directivas CE | in conformità alle direttive CE

| | |
|---|---|
| **2006/95/EC** | Low voltage equipment |
| **2004/108/EC** | Electromagnetic compatibility |
| **2002/95/EC** | Restriction of Hazardous Substances |
| **2002/96/EC** | Waste Electrical and Electronic Equipment |

is in compliance with the following normative documents: | mit den folgenden normativen Dokumenten übereinstimmt: | aux documents normatifs ci-après: | cumple las documentos normativos: | soddisfa le normative seguenti:

| | |
|---|---|
| **EN 61010-1** | Safety requirements for electrical equipment for measurement, control and laboratory use - General requirements. |
| **EN 61326-1** | Electrical equipment for measurement, control and laboratory use - EMC requirements. |

**Standards for Canada and USA**

| | |
|---|---|
| **CAN/CSA-C22.2 No. 61010-1** | Safety requirements for electrical equipment for measurement, control and laboratory use - General requirements. |
| **UL Std. No. 61010-1** | Safety requirements for electrical equipment for measurement, control and laboratory use - General requirements. |
| **FCC, Part 15, Class A** | Emission |

Hudson, New Hampshire, USA - March 23, 2012

Gary Nelson
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## Imprint



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Further information and operating instructions in other languages are available from info@integra-biosciences.com.

# 1 Introduction

These operating instructions contain all the information required for installation, operation and maintenance of the VIAFILL.

## 1.1 Symbols used

The operating instructions specifically advise of residual risks with the following symbols:

***WARNING***

*This safety symbol warns against hazards that could result in injury. It also indicates hazards for machinery, materials and the environment. It is essential that you follow the corresponding precautions.*


***CAUTION***

*This symbol cautions against potential material damage or the loss of data in a microprocessor controller. Follow the instructions.*

***NOTE***

*This symbol identifies important notes regarding the correct operation of the device and labour-saving features.*

## 1.2 Intended use

The VIAFILL has been designed for use in a laboratory. The VIAFILL is a rapid reagent dispenser, plate washer, pipettor and serial dilutor in the volume range of 0.5 - 9’999 µl using a variety of tubing sets. The GripTip pipette tip option allows to utilize the VIAFILL as a serial dilutor. It shall not be used for applications other than those specified.

## 1.3 Safety notes

1) The VIAFILL corresponds to the state of the art, complies to the recognized safety regulations and is safe to operate. The VIAFILL can be operated only when it is in perfect condition and while observing these operating instructions.
2) The device may be associated with residual risks if it is used or operated improperly by untrained personnel. Any person operating the VIAFILL must have read and understood these operating instructions, and particularly, the safety notes, or must have been instructed by supervisors so that safe operation of the device is guaranteed.
3) Regardless of the listed safety notes, additional applicable regulations and guidelines of trade associations, health authorities, trade supervisory offices, etc. must be observed.
4) Do not open or modify the VIAFILL in any way. The back panel must not be removed. Repairs may only be performed by INTEGRA Biosciences AG or by an authorised after-sales service member.
5) Parts may be replaced with original INTEGRA Biosciences parts only.
6) AC Inlet: If any abnormalities occur such as smoking or ignition, immediately disconnect device (AC Inlet) from power supply. Therefore, set up VIAFILL where it is easy to insert and remove a power cable from AC Inlet.
7) Outlet Requirement: Only use grounded outlets when plugging in the VIAFILL. DO NOT USE UNGROUNDED OUTLETS!
8) Do not use the VIAFILL near flammable material or in explosive areas. Also, do not pipette highly flammable liquids such as acetone or ether.
9) When handling dangerous substances, comply with the material safety data sheet (MSDS) and with all safety guidelines such as the use of protective clothing and safety goggles.
10) Prolonged exposure of the VIAFILL to UV-light can cause discolouration and/or yellowing of the control unit. However, this will not affect the performance of the device in any way.

# 2 Description of the device

## 2.1 Scope of delivery

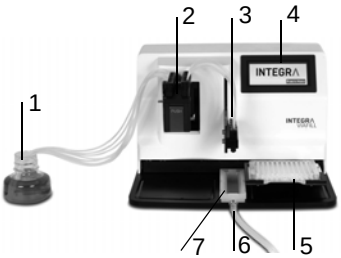
- VIAFILL base unit
- Reservoir with waste nozzle
- Waste tubing
- 25 ml reservoir sample pack
- 8 channel plastic dispensing cassette, sterile, 5-9999 µl
- Power cord
- Operating instructions


***CAUTION***

*Verify the scope of delivery when unpacking the device and check for potential transportation damage. Do not operate a device that is damaged, instead contact your local dealer.*

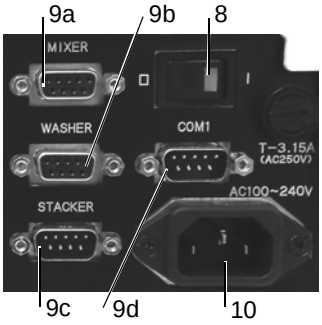
## 2.2 Overview of the VIAFILL

### 2.2.1 Front view



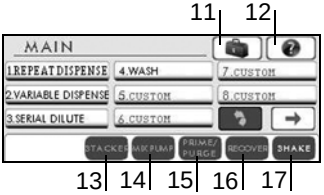

1 **Source bottle** with source tubings and weight
2 **Pump head** with rotor and inserted dispensing cassette
3 **Pipetting arm** with dispensing cartridge
4 **Touch screen display**
5 **Plate deck** with plate mover
6 **Waste tubing**
7 **Waste & reservoir station**

### 2.2.2 Back view




8 **Main switch**
9 **RS232 Ports:**
  9a for external mixing pump
  9b for washing module
  9c for stacker
  9d additional port for PC
10 **Power supply port**

### 2.2.3 Display




11 **Toolbox**, for general settings.

12 **Help**, to explain screens.

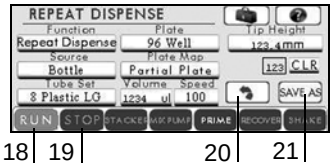
13 **Stacker**, option to stack plates, will be highlighted if STACKER is properly connected.

14 **Mix Pump**, option to mix source container, will be highlighted if MIX PUMP is properly connected.

15 **Prime/Purge** button aspirates the source fluid, filling the dispensing cassette and pre-dispenses the source fluid. Hold button until source fluid is dispensed.

16 **Recover**, reverse pump movement to recover the liquid from the tubing into the source bottle as long as button pressed.

17 **Shake**, to shake the plate linearly as long as button held down.




18 **Run**, to start the dispensing protocol.

19 **Stop**, to stop the protocol at any time.

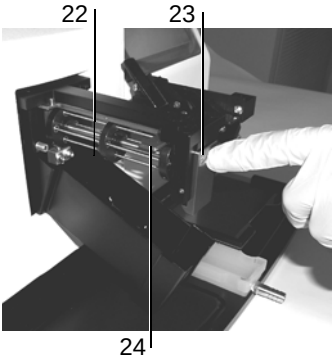
20 **Back**, to navigate to the previous screen.

21 **Save as**, to save the pipetting parameters with a custom name.

***NOTE***

*The buttons are operational if the text is white and not available if the text is grey.*

### 2.2.4 Pump head

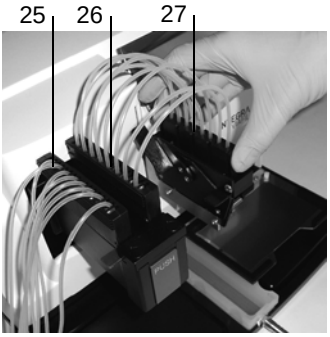



22 **Pump rollers**, peristaltic pump rotors where cartridge tubings are stretched against.

23 **Green PUSH button**, to lower the housing of the pump rotor.

24 **Silver lever**, down position for loading of dispensing cassettes and to release the tubing tension (rest position).

### 2.2.5 Dispensing cassette




25 **Left tubing cartridge** with two holes, inserted on the silver lever.

26 **Right tubing cartridge**, placed in the groove on the pump head.

27 **Dispensing cartridge**, inserted on the holder of the pipetting arm.

| Expression on display | Dispensing cassettes | Part No. |
|---|---|---|
| Large 8-channel Plastic Tip | 8 channel, standard bore | 5724 |
| Small 8-channel Plastic Tip | 8 channel, small bore | 5722 |
| 16-channel Plastic Tip | 16 channel, small bore | 5742 |
| 8-channel Washing | 8 channel wash set | 5960 |
| 16-channel Washing | 16 channel wash set | 5965 |
| 300 µl 8-channel Pipet Tip | 8 channel tubing set for GripTips | 5821 |
| 125 µl 16-channel Pipet Tip | 16 channel tubing set for GripTips | 5841 |

Stainless Tips or Metal Tips are not available yet.

# 3 Installation

## 3.1 Operating environment

The VIAFILL has been designed for use in a laboratory. It shall be operated in a dry and dust-free location without large temperature fluctuations or direct sunlight. Place the VIAFILL on a flat, dry, clean and vibration-proof bench. Leave at least 10 cm (3.9 in.) space on both sides and on the back to allow adequate air circulation.

## 3.2 Assembling the instrument

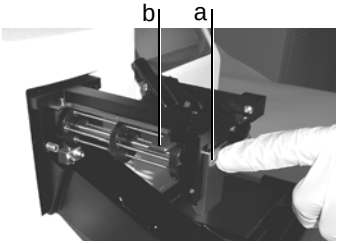
Unpack the VIAFILL from the packaging configuration. Attach the power cord. Ensure that the mains switch (8) on the back panel is in the OFF position.

### 3.2.1 Installing the dispensing cassettes

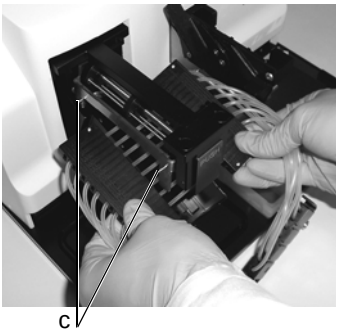
Different dispensing cassettes, GripTip kits or wash sets can be used with the VIAFILL.

The standard dispensing cassette is designed for rapid reagent addition using the Repeat Dispense and Variable Dispense functions. The standard dispensing cassette does not function with the Serial Dilute or Wash functions.

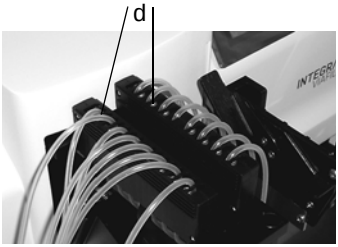
The VIAFILL GripTip option is designed for the Repeat Dispense, Variable Dispense and Serial Dilute functions.



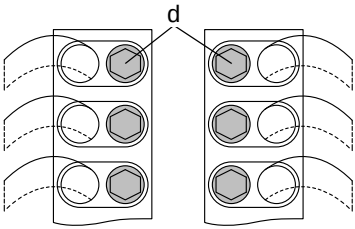

1) Press the green **PUSH** button (a) on the front of the pump head (2) to lower the housing and reveal the rollers that the tubing must be clamped against.
2) Press the silver lever (b) into the down position. This will allow the dispensing cassette to be loaded.

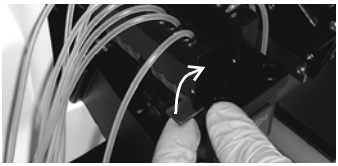



3) Slide the dispensing cassette under the rollers of pump head. Fit the two holes on the inside of the left black cartridge (25) with the two silver pins (c) located on the sliver lever. Position an equal number of tubes on either side of the black roller wheel (22).



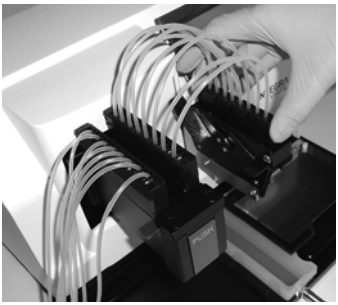

4) Stretch the right black cartridge (26) upwards and set into the groove on top of the pump head (23).
5) Ensure all (16 or 32) adjustment screws (d) are on the inside of the cartridges and the tubings on the outside!



6) Pull the sliver lever back up into position, as shown by the arrow. Both black cartridges should now be in the upright position.
7) Lift the black pump housing back into position.

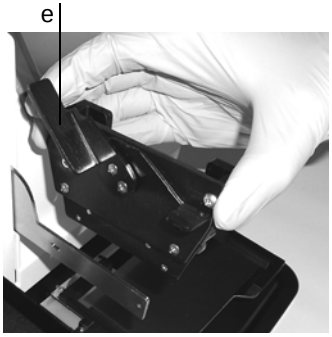
**Standard dispensing cassettes:**



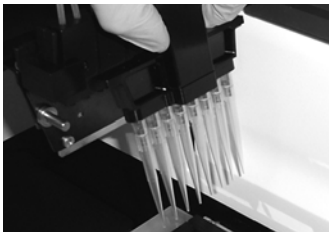
8) Place the dispensing cartridge (27) into standard cassette holder (3.2.2) on the pipetting arm.

   Put the source tubing into the source container.

**Alternatively, GripTip Kit:**

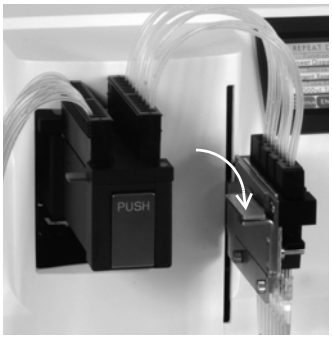



8) Open the lever (e) on the back of the left side of the GripTip adaptor and place the GripTip adaptor on the pipetting arm. Secure the GripTip adaptor with the two screws, beginning with the frontmost.



9) Place the dispensing cartridge into the GripTip adaptor.

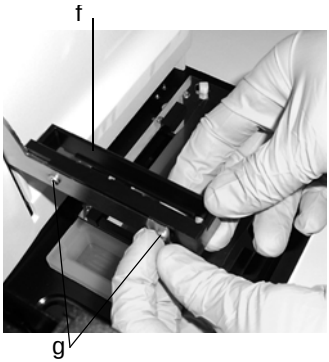
10) Load GripTip pipette tips onto the pipetting head and slide the head into the GripTip adaptor.




11) Tighten the lever of the GripTip adaptor by moving it to the front right side, as shown by the arrow.

Put the source tubing into the source container.

### 3.2.2 Changing dispensing cassette holder or GripTip adapter




1) If the dispensing cassette holder (f) is installed, unscrew the two screws (g) on the pipetting arm and remove the holder.
2) If the GripTip adaptor is installed, unscrew the two screws (f) on the pipetting arm and remove the adaptor. Place the standard cassette holder on the pipetting arm and fix it, beginning with the frontmost screw.

### 3.2.3 Tubing selection for 6 through 48 well dispensing

Just disconnect the appropriate tubing from the source tubing weight (1) to adapt the tubing to dispense liquid into 6, 12, 24, and 48 well plates.

***NOTE***

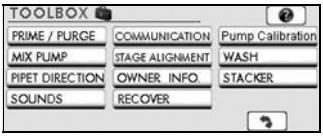
*6, 12, 24, and 48 well plates can only be dispensed to using the standard dispensing cassettes. The VIAFILL GripTip kits cannot dispense to 6, 12, 24 and 48 well plates.*

Below is an instructional diagram for use of 8 channel cassette tubing sets on 6, 12, 24, and 48 well plates. Simply attach the standard 8 channel cassettes (5722 & 5724) and disconnect the tubes shown below. Tube one is closest to the instrument. Select the desired program; select the correct 8 channel tubing set and a 96 well plate.

| | **6 Well Plate** | **12 Well Plate** | **24 Well Plate** | **48 Well Plate** |
|---|---|---|---|---|
| Tube 1 | disconnect | disconnect | | |
| Tube 2 | | | disconnect | |
| Tube 3 | disconnect | disconnect | | disconnect |
| Tube 4 | disconnect | | disconnect | |
| Tube 5 | disconnect | disconnect | disconnect | |
| Tube 6 | | disconnect | | |
| Tube 7 | disconnect | | disconnect | disconnect |
| Tube 8 | disconnect | disconnect | | |

## 3.3 Toolbox - adapt your VIAFILL

The TOOLBOX is accessible from the Main Menu and the different function screens (Repeat Dispense, Variable Dispense, Serial Dilute and Wash).

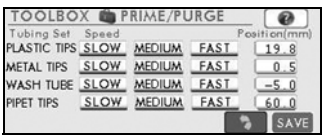



Simply press the red **TOOLBOX** case to access the TOOLBOX MAIN MENU. Once in the Toolbox, select the desired function to change its settings.

| Toolbox options | Description |
|---|---|
| Prime/purge | Allows the height and speed of the prime to be adjusted for each dispensing cassette. |
| Mix pump | Allows the pump to be turned ON or OFF. The interval and timer settings can also be adjusted. |
| Pipet direction | Choose from Straight and Stagger pipetting directions. |
| Sounds | Allows beep tones to be turned ON or OFF. |
| Communication | Turns PC communication capability ON or OFF. |
| Stage alignment | Allows cassette nozzles to be properly positioned over a well. |
| Owner information | Displays the serial number, software version and display version. The owner name can also be modified using this option. |
| Recover | Allows the height and speed of the recover function to be adjusted for each dispensing cassette. |
| Pump calibration | Allows to change the calibration factor of the pump. |
| Wash | Allows the pump to be turned ON or OFF. Also allows the wash interval and timer to be adjusted. |
| Stacker | Allows the Stacker to be turned On or Off. |

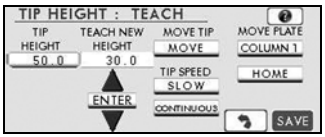
### 3.3.1 Prime/purge

A prime/purge is performed when pressing the **PRIME** button in the function menus (Repeat Dispense, Variable Dispense, Serial Dilute and Wash).



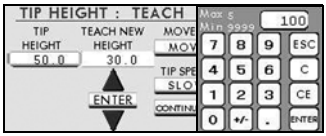

PRIME speeds can be set for the different tubing sets; PLASTIC TIPS, METAL TIPS, WASH TUBE and PIPET TIPS. Select the **Speed**.

Press the **Position (mm)** button to adjust the height that the PRIME and PURGE will be performed at.




The current tip height setting is displayed on the left of the screen.

a) Press the MOVE PLATE button titled **HOME** to move the plate deck to the far right. Use this position to set the prime and purge heights.
b) Adjust the tip adjustment speed by pressing the **FAST**/**SLOW** and **CONTINUOUS**/**STEP** buttons. Press the ▲ **UP** and ▼ **DOWN** arrows to adjust the tip height.
c) Press **ENTER** to select the tip height and press **SAVE** to continue.




The height can also be entered using a keypad by pressing the **TIP HEIGHT** button. Once the numerical value is entered, press **MOVE TIP** to move the pipet tips to the new tip height value (or alternatively to the upmost position). Press **SAVE** to continue.

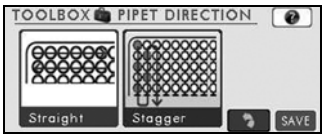
### 3.3.2 Mix pump (optional)

The external mixing pump allows users to keep cells in suspension while simultaneously dispensing to microwell plates. Select the **MIX PUMP** option from the **TOOLBOX**.

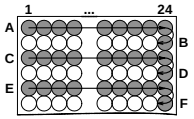

Turn the external mixing pump **ON** or **OFF** by pressing the **YES**/**NO** button. The interval button defines how many seconds the pump runs in each direction. The Timer defines the total time the pump will run in intervals until shutting off.

### 3.3.3 Pipet direction

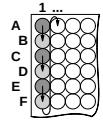
The function only applies when using an eight channel tube set to dispense to a 384 well plate or when using a sixteen channel tube set to dispense to a 1536 well plate. The plates are filled in two steps, depending on the defined pipetting direction:




- **STRAIGHT**: first every other row (A, C, E,...) is dispensed, starting from the first column and then the pipetting arm shifts sideways to fill the remaining rows (B, D, F,...) starting from the last column.
- **STAGGER**: every column is dispensed in two steps starting from the first column with every other rows (A, C, E,...) and then followed by the remaining rows (B, D, F,...).




Straight




Stagger

Select the preferred pipetting direction and press **SAVE** to continue.

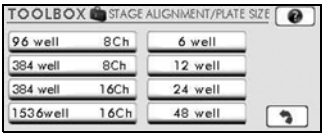
### 3.3.4 Sounds

Turn beep tones ON or OFF by selecting the buttons **YES** or **NO**. Sounds can be managed for PROGRAM END and ERRORS. Press **SAVE** to continue.

### 3.3.5 Communication


Turn the communication capability ON or OFF. This enables users to communicate to the VIAFILL using API commands via a PC.

### 3.3.6 Stage alignment




Adjust the plate stage for differing well plate and tubing set combinations. This option ensures the dispensing nozzles are centered over the microplate wells. The Stage Alignment screen will appear once the button is pressed.


First, press the **MOVE** button to position the plate in the teach position. Press **FAST** or **SLOW** and **CONTINUOUS** or **STEP** to adjust the stage movement speed. Use the **ARROW** buttons of Z AXIS to position the dispensing tips above the plate.
Adjust the X and Y stage position to the desired location by the **ARROW** buttons.
Press **SAVE** to update and save current settings.

### 3.3.7 Owner Information

Press the **NAME** button to change the owner and press **SAVE**. The SERIAL NUMBER, SOFTWARE version and FIRMWARE version is also displayed here. Press **BACK** to continue.

### 3.3.8 Recover

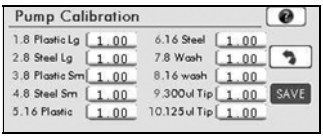
The recover function reverses the peristaltic pump direction to move the liquid in the tubing back in to the source container. This function is only available for the standard tubing casettes.


RECOVER speeds can be set for the different tubing sets.

Press the **Position (mm)** button to adjust the height that the RECOVER will be performed at, see 3.3.1.

### 3.3.9 Pump calibration

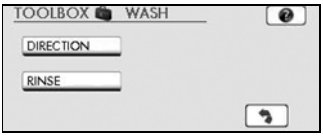
Each tubing sets factory setting is 1.00 (100 percent). To change the calibration factor, simply press the value next to the desired tubing set.




Use the keypad to adjust the calibration factor. To increase the volume by one percent; press 1.01 and press **ENTER**.

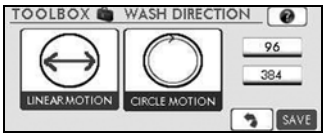
Press **SAVE** to continue.

### 3.3.10 Wash (optional)




The two Wash options are **Direction** and **Rinse**.

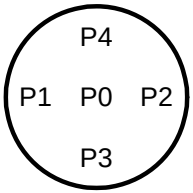
Press the **Direction** button to adjust the direction the aspiration nozzles move.




Select the direction that the aspiration tube aspirates the reagent from the well plate. The two options are linear and circular.

A different wash pattern can be selected for both a 96 and a 384 well plate. Selecting a plate will take you to the wash direction screen.

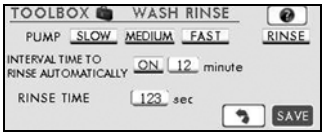

First, press the **P0 MOVE** button to position the plate in the teach position. Use the **ARROW** buttons of Z AXIS to position the nozzles above the plate. Adapt the teach position, so that the nozzles target the center of the wells, press **SAVE** and select P0.




Press **TP Move** and select one of the 4 positions to be defined, where P1 and P2 are the left- and rightmost, P3 and P4 the lower- and topmost positions within the wells. The plate and the pipetting arm move to the selected position. Adjust the X and Y position by the **ARROW** buttons. Press **SAVE** and select the previously adjusted position (P1-P4).

Press **BACK** to continue.

Press the **Rinse** button to set the Rinse frequency and duration. The purpose of the rinse feature is to clean the wash tubing set in between plate washes. The rinse and wash fluids are contained in different bottles.

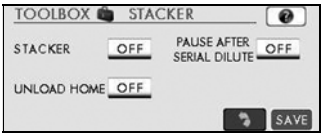



First, select the pump speed. Turn **ON** the interval time and press the time button to set the amount of time between each rinse. Select the rinse time button to set the duration of the rinse. Also, the rinse button can be held down to perform an immediate rinse.

Press **SAVE** to continue.

### 3.3.11 Stacker (optional)

The VIAFILL plate stacker allows for microwell plates to be stored, dispensed to and then restacked.




Press the Stacker in the **TOOLBOX** main menu to turn the stacker **ON** (and **OFF**).

Turn UNLOAD HOME **ON** and the carrier of the stacker will restack the plate to unload the stacker at the beginning of the run. The stacker will confirm there are no plates on the carrier.

Turn PAUSE AFTER SERIAL DILUTE **ON** when using the **GripTip kit** to perform multiple in-plate serial dilutions using the stacker. After each plate, the VIAFILL will pause to allow the user to eject GripTips and load new GripTips. Only in-plate serial dilutions can be performed using the stacker! The sample cannot be aspirated from the reservoir when using the **GripTip kit**!

Press **SAVE** to continue.

## 3.4 Help screens

Press the blue question mark on any screen to access the Help Text. The Help Text explains each screen in detail.

# 4 Installation of optional accessories

## 4.1 Wash module

The VIAFILL can be converted from a reagent dispenser to a plate washer by attaching the wash tubing set and external wash module. This allows users to wash plates and aspirate the waste to an external waste container.

### 4.1.1 Materials included

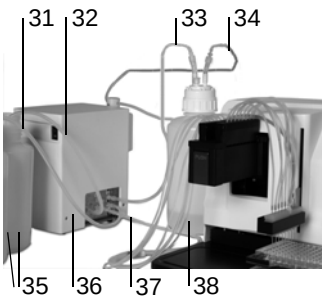
Unpack the wash module and confirm the contents. These include:

- 1 x main wash module tower
- 1 x large waste container
- 1 x waste container lid
- 2 x small rinse and wash fluid containers
- 5 x pieces of silicone tubing: 3 short, 1 long, 1 wide bore tubing
- 1 x power cable
- 1 x RS232 communication cable

***NOTE***

*The wash tubing set (8 channel is part no. 5960, 16 channel is part no. 5965) needs to be ordered separately.*

### 4.1.2 Description of the wash module




31 **Wash tubing (W)**, connected to wash container

32 **Rinse tubing (R)**, connected to rinse container

33 **Wide bore air tubing (A)**, connected to waste container lid

34 **Long waste tubing (A)**, fitted end connected to waste container lid, other end to wash tubing cassette head, clamped on the top of the wash module

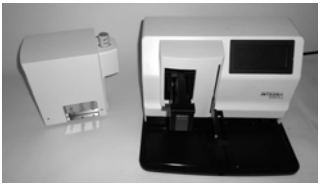
35 **Wash and Rinse containers**

36 **Wash module**

37 **Nozzle tubing (N)**, connected with wash tubing cassette

38 **Waste bottle**

### 4.1.3 Wash module set up

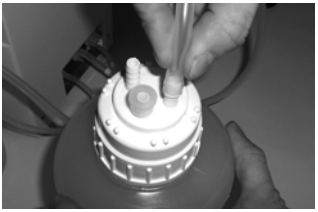


1) Place the wash module tower next to the VIAFILL.

2) Plug the power cable into the back of the wash module.
3) Connect the RS232 cable from the VIAFILL to the wash module.

4) Place short tubing (R) into the small rinse container and connect the other end to the wash module port labeled RINSE.
5) Place short tubing (W) into the small wash container and connect the other end to the wash module port labeled WASH.

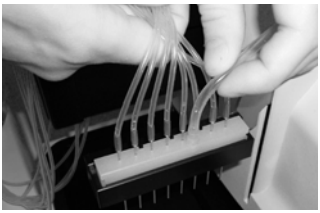
6) Connect wide bore air tubing (A) to the wash module port labeled AIR.



7) Connect the other end of the wide bore air tubing (A) to the waste container lid (either port).
8) Connect the long waste tubing end with fitting (A) to the waste container lid (second port).

9) Press the middle of the long tubing (labeled A) into the pump head on the top of the wash module. Do not connect the other end yet.

10) Connect the small tubing (N) into the wash module port labeled NOZZLE. Do not connect the other end yet.



11) Load either the 8 channel wash tubing cassette (5960) or 16 channel wash tubing cassette (5965) onto the VIAFILL. See section 3.2.1 for instructions on how to install cassettes.

12) Connect other end of long tubing (labeled A) to the top of the wash tubing cassette head.

13) Connect the other end of the nozzle tubing (N) to the nozzle on the end of the wash tubing cassette.

## 4.2 Plate stacker

The VIAFILL plate stacker allows for microwell plates to be stored, dispensed to and then restacked. Two plate chimneys are available with the capacity of 25 plates or 50 plates.

### 4.2.1 Materials included

Unpack the plate stacker and confirm the contents. These include:

- Stacker base unit
- Power cable
- Serial communication cable
- Waste tubing
- Chimney hardware (2 support brackets, 4 hexagon head screws and 4 washers)
- 2 clips, rubber pad

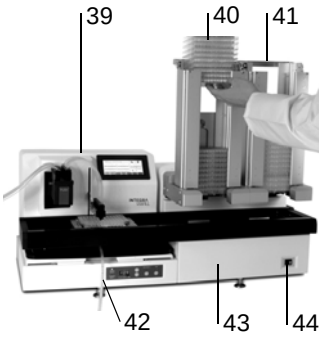
***NOTE***

*Stacker Chimneys sold separately from base unit. Two Chimneys must be ordered to use the stacker properly.*

Two individuals are required to lift the stacker base unit onto a level bench.

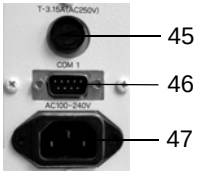
### 4.2.2 Description of the stacker

**Front view**




39 **VIAFILL base unit**, not included
40 **Plate chimney position 1**, not included
41 **Plate chimney position 2**, not included
42 **Waste tubing**
43 **Stacker base unit**
44 **Stacker ON/OFF switch**

**Back view**




45 **Fuse**
46 **RS232 Port**, for VIAFILL
47 **Power supply port**

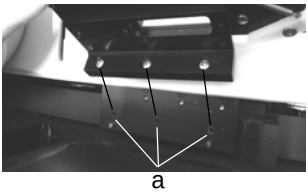
**Front panel**


48 **Arrow keys**, to adjust the plate size.
49 **Re-stack**, to restack the plates back to the first chimney position
50 **Lids**, to remove the lids before dispensing

### 4.2.3 Stacker set up

1) **Put the VIAFILL into "STACKER" mode:**
Turn the VIAFILL ON and press the red **TOOLBOX** icon in the upper right corner. Press **Stacker** in the **TOOLBOX** main menu to turn the stacker ON, see "Stacker (optional)" on page 20. This must be completed before connecting the stacker. Turn the VIAFILL OFF before continuing.

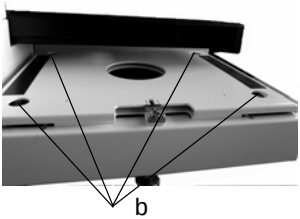
2) **Remove the VIAFILL reservoir and stage:**




Simply slide the reservoir holder out of the VIAFILL base.

Three cross slot screws (a) need to be removed on the underside of the plate deck (5). This will allow the entire plate deck to be removed.

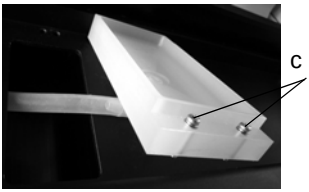
3) **Slide the VIAFILL onto the stacker:**




Slide the VIAFILL from the back onto the stacker base unit (43).

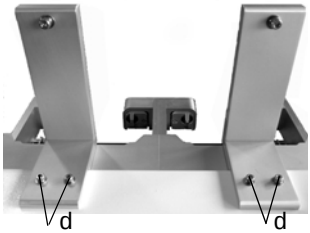
The VIAFILL feet will fit into four holes (b) on the deck of the stacker.

4) **Insert the reservoir:**

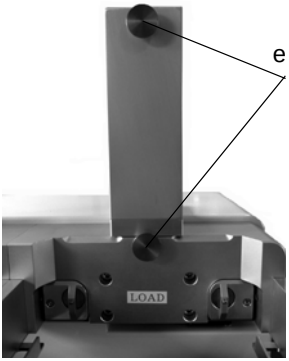



Attach the waste tubing to the reservoir and tighten the 2 screws (c) with a hexagon wrench.

5) **Asseble the chimneys:**

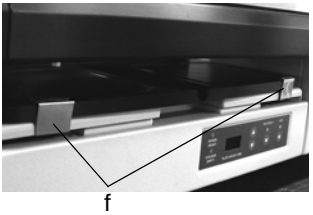



Assemble stacker chimney support brackets with 2 hexagon head screws and washers each (d) on stacker base by using hexagon wrench.




Connect the stacker chimneys by lowering them over the pins (e) on the chimney support brackets.

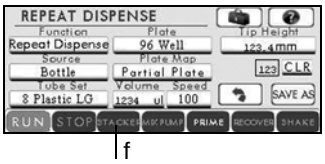
6) **Attach the clips and the pad:**




Attach the two clips (f) to secure the VIAFILL to the stacker.

Place the adhesive back of the rubber pad on the stacker rail where the pipetting arm track meets the stacker rail.

7) **Connect the cables:**
Use RS232C cable to connect the VIAFILL and Stacker Base. Connect the RS232C cable to the marked port on the back panel of the VIAFILL (9c). Attach the power cords. Turn on the power for both the VIAFILL and the Stacker at the same time.




The **STACKER** button (f) will appear red if the stacker is installed correctly and activated.

## 4.3 External mixing pump

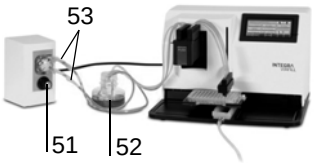
The external mixing pump allows users to keep cells in suspension while simultaneously dispensing to microwell plates. With the VIAFILL cells are not damaged while kept in suspension at all times.

### 4.3.1 Materials included

Confirm the contents of the external mixing pump set. These include:

- Mixing pump
- Tubing set
- RS232 Connection cable

### 4.3.2 Description of the external mixing pump




51 **Mixing pump**, with mix speed adjustment knob

52 **Source container**

53 **Mix pump tubing**

### 4.3.3 Mixing pump set up

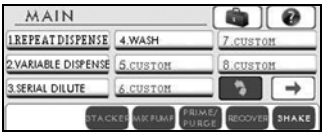
1) Remove the plastic cover for the mixing pump. Press the tubing set into the mixing pump track. Replace the plastic housing.
2) Plug the RS232 cable into the back of the mixing pump and into the back of the VIAFILL. The external mixing pump does not require its own power cable.
3) Turn on the VIAFILL and press the red **TOOLBOX** icon in the upper right corner. Select the **Mix pump** option from the **TOOLBOX** main menu and switch the mix pump on, see "Mix pump (optional)" on page 17.
4) Adjust the speed of the external mixing pump by turning the knob on the front of the pump.

# 5 Operation

## 5.1 Turn on the device


***CAUTION***
*Remove hands from the VIAFILL at switch on and during homing.*

Turn on the VIAFILL by pressing the main switch (8) that is located on the back panel.




If the VIAFILL starts properly:

- the display lights up,
- you are prompted to **Press to Home** to perform a homing routine,
- the **MAIN MENU** is displayed as shown beside.

## 5.2 Quick start guide

The following quick start list gives you an overview how to start pipetting immediately:

1) Insert an appropriate dispensing cassette, see 3.2.1.
2) Turn on the VIAFILL.
3) With standard dispensing cassette installed define the prime and recover heights in the **TOOLBOX**, see 3.3.1 and 3.3.8. Before performing wash plates, define the wash parameter in the **TOOLBOX**, see 3.3.10.
4) Select one of the pipetting functions from the **MAIN MENU**.
5) Check or change the plate, the source container, the tubing set, which wells to fill, the dispense volume, the speeds, and the tip height, see 5.3.
   Alternatively select a custom function with all parameters stored.
6) With standard dispensing cassette installed press **PRIME** until liquid is dispensed from tips.
7) Press the green **RUN** button to start.
8) Before prolonged standby, wash the cassette and store it in the rest position, see 6.1.
9) Turn off the VIAFILL.

## 5.3 Pipetting functions

### 5.3.1 Overview

The VIAFILL provides the following pipetting functions, depending on the dispensing cassette installed. Within the table, the source container is listed:

| Function | Dispensing cassette | GripTip kit | Wash tubing set |
|---|---|---|---|
| Repeat dispense | Bottle | Reagent reservoir | NA |
| Variable dispense | Bottle | Reagent reservoir | NA |
| Serial dilute | NA | Reagent reservoir or plate | NA |
| Wash | NA | NA | Bottle |

**REPEAT DISPENSE:**
The function is designed to rapidly fill a micro plate from a source container.

**VARIABLE DISPENSE:**
The function is designed to rapidly fill differing volumes to a micro plate from a source container. The volumes can be programmed for each individual column.

**SERIAL DILUTE:**
The function for the GripTip adaptor is designed to rapidly dilute a microwell plate from the reagent reservoir or from a selected plate column.

**WASH:**
The module allows users to wash plates and aspirate the waste to an external waste container. Also, a timed rinse can be programmed to rinse remaining waste from the tubing set. To enhance the efficiency of the aspiration a choice of aspiration patterns can be set in the Toolbox for linear or circular paths within each well.

**Dispensing cassette:**
The standard dispensing cassettes or the wash tubing set work as a flow through system. Only a **Bottle** can be utilized as a source container, because they do not have the ability to aspirate from a reservoir or a plate.

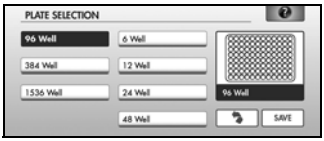
**GripTip kit:**
The GripTip pipette dispensing option is not a flow through system. The liquid must be aspirated separately. The GripTip kit only functions with a **Reagent Reservoir** or a **Plate** source options.

### 5.3.2 Repeat and variable dispense

Select the **REPEAT DISPENSE** or **VARIABLE DISPENSE** function from the **MAIN MENU** and set the desired parameters.

**1) Select the plate that is located on the deck**

Press the **Plate** option in the selected pipetting menu.

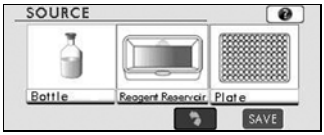



Match the plate on the screen to the plate that is seated on the VIAFILL plate deck. After selecting the correct plate, press the **SAVE** button.

See section 3.2.2 to see what tubes or which pipet tips to disconnect to dispense to a 6, 12, 24 or 48 well plates.

**2) Select the source container**

Click on a **SOURCE** option in the selected pipetting menu.




**Dispensing cassettes:**

Only the **Bottle** can be utilized with the standard dispensing cassettes. Selecting the **Plate** or **Reagent Reservoir** option will disallow the selection of the standard dispensing cassettes.

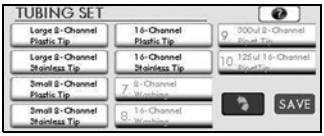
**GripTip kit:**

The **Reagent Reservoir** should be selected using the GripTip pipette tip option.

Press **SAVE** to continue.

**3) Select the tubing set**

Press the button below **TUBE SET** in the selected pipetting menu. Select the tubing set that is currently installed in the VIAFILL (see "Dispensing cassette" on page 11) and press **SAVE**.




**Dispensing cassettes:**

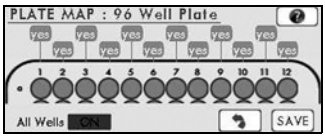
The 16-Channel tubing sets are greyed out if the current destination plate is a 96 well plate. Select a 384 well plate to allow the selection of 16-Channel tubing sets.

**GripTip kit:**

Select the 300 µl 8-Channel Pipet Tip tubing set or the 125 µl 16 Channel Pipet Tip tubing set.

**4) Select which wells to fill**

Press the **Plate Map** option in the selected pipetting menu.



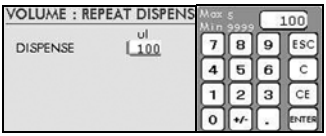

Press the **YES** and **NO** buttons to select and deselect columns. Press the **ALL WELLS** button to select or deselect the entire plate.

Press the **SAVE** button to continue.

**5) Select dispense volume(s)**

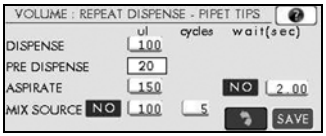
Press the **Volume** button in the selected pipetting menu.

**REPEAT DISPENSE:**




Press the **DISPENSE** Volume input field to display the keypad. Enter the desired volume and press **ENTER**.

- **DISPENSE**: The volume being delivered to each well.

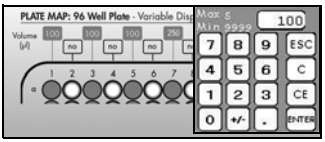



**GripTip kit only:**

- **DISPENSE**: The volume being delivered to each well.
- **PRE DISPENSE**: This volume cannot be adjusted. This volume is used to increase accuracy and precision and also to set the peristaltic pump in the correct position. The predispense volume for the 300 µl tubing set is 20 µl and for the 125 µl tubing set is 4 µl.
- **ASPIRATE**: The volume that is aspirated. For aliquot dispensing set the volume by a multiple of dispense volume.
- **MIX SOURCE**: The volume that the pipet tips aspirate and dispense into the reservoir before the Repeat Dispense begins.
- The Mix Source number of **Cycles** can also be set and turned On or Off (**YES** or **NO**).
- A pause (**wait sec**) can be set and adjusted. This pause is between each aspirate and dispense.

Press **SAVE** to continue.

**VARIABLE DISPENSE:**



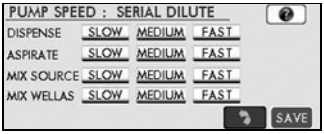

Only the wells that were selected as **YES** in the **PLATE MAP** screen are allowed to be edited. Press the column volume indicator to activate the volume keypad as shown here. Enter the desired volume for each column and press **ENTER**.

Press **SAVE** to continue.

For filling less than 96-well plates some tubes need to be removed from source, see “Tubing selection for 6 through 48 well dispensing” on page 15. In addition, the corresponding columns have to be deactivated in the plate-map-function in order to obtain a correct and clean filling.

### 6) Select the speeds

Press the **Speed** button in the selected pipetting menu.




Select the desired dispense speed(s) and press **SAVE**.

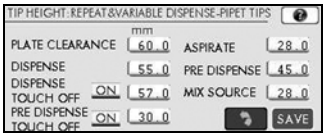
### 7) Adjust the tip height

Press the **Tip Height** button in the selected pipetting menu.


**Dispensing cassettes:**

The plate clearance, dispense and pre-dispense heights can all be easily adjusted.

- **Plate Clearance**: The distance the dispensing cassette parks over the plate when the plate is moving between wells.
- **Dispense**: The height of each column dispense. This height can be set within the microwell plate.
- **Pre Dispense**: The height the dispensing cassette dispenses to the waste container before dispensing to the plate.

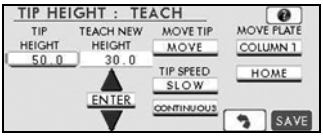



**GripTip kit:**

The GripTip tubing cassette allows for additional tip heights to be set. The Touch Off heights can be easily turned **ON** or **OFF** in the menu.

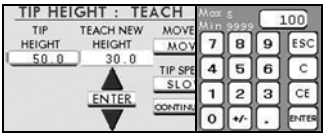
- **Dispense Touch Off**: This is the height that the pipet tips touch the dispensed reagent to eliminate any remaining reagent on the end of the pipet tips. This is performed at the end of each column dispense.
- **Pre Dispense Touch Off**: This is the height that the pipet tips touch the reservoir reagent after the pre dispense. Turn **ON** to eliminate any remaining reagent on the end of the pipet tips.
- **Aspirate**: This is the reagent aspiration height from the reservoir. The overall dispense volume should be considered to ensure the aspirate height is deep enough with the reagent reservoir to accommodate the total of all dispenses.
- **Mix Source**: This is the height that the pipet tips mix the reservoir reagent before the repeat dispense begins. Set the Mix Source height in conjunction with the Mix Source volume to ensure no air is aspirated into the pipet tips.

**Teaching procedure for ALL FUNCTIONS:**
Press the height button (**mm**) to open the tip height teach screen. The current **TIP HEIGHT** is displayed on the left of the screen.




Press the MOVE PLATE button titled **COLUMN 1** to move the plate deck under the dispensing cassette cartridge.
Use this position to set the heights. (The MOVE PLATE **HOME** button moves the plate deck to the far right.)

a) Press the ▲ **UP** and ▼ **DOWN** arrows to adjust the tip height. Adjust the tip adjustment speed by pressing the **FAST**/**SLOW** and **CONTINUOUS**/**STEP** buttons. Press **ENTER** to select the tip height and press **SAVE** to continue.

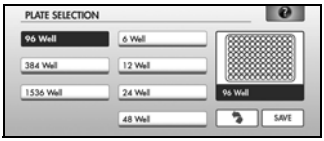



b) The height can also be entered using a keypad by pressing the **TIP HEIGHT** button. Once the numerical value is entered, press **MOVE TIP** to move the pipet tips to the new tip height value.
Press **SAVE** to continue.

### 5.3.3 Serial dilute

Select the **SERIAL DILUTE** function from the **MAIN MENU** and set the desired parameters.

**1) Select the plate that is located on the deck**
Press the **Plate** option in the **SERIAL DILUTE** menu.




Match the plate on the screen to the plate that is seated on the VIAFILL plate deck. After selecting the correct plate, press the **SAVE** button.

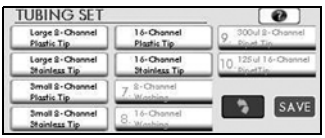
See section 3.2.2 to see what tubes or which pipet tips to disconnect to dispense to a 6, 12, 24 or 48 well plates.

**2) Select the source container**
Click on a **SOURCE** option in the **SERIAL DILUTE** menu.


Select a **Reagent Reservoir** or a **Plate** as source.

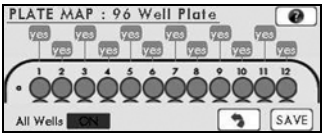
Press **SAVE** to continue.

**3) Select the tubing set**
Press the button below **TUBE SET** in the **SERIAL DILUTE** menu. Select the GripTip tubing set that is currently installed in the VIAFILL (see "Dispensing cassette" on page 11) and press **SAVE**.




**GripTip kit:**
Select the 300 µl 8-Channel Pipet Tip tubing set. Currently, the 300 µl 8-Channel Pipet Tip tubing set is the only available in the **SERIAL DILUTE** menu.

**4) Select which wells to fill**
Press the **Plate Map** option in the selected pipetting menu.

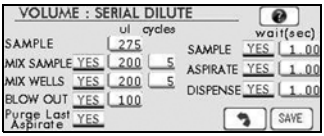



Press the **YES** and **NO** buttons to select and deselect columns. Press the **ALL WELLS** button to select or deselect the entire plate.

Press the **SAVE** button to continue.

**5) Select dispense volume(s)**

Press the **Volume** button in the **SERIAL DILUTE** menu.



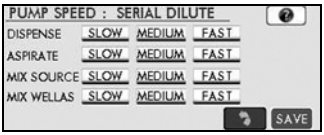

Select **YES** or **NO** to activate or deactivate the desired options. Press the value buttons to activate the keypad, e. g. volume (**µl**), **cycles**, **wait (sec)**. Enter the desired parameters and press **ENTER**.

- **Sample**: This is the sample volume that is aspirated/ dispensed into each well.
- **Mix Sample**: Mixes the sample in the source container. Set the mixing volume and the number of **cycles** and press enter.
- **Mix Wells**: Mixes the sample that is dispensed to each column. Set the number of cycles to mix each well and press enter.
- **Blow Out**: The blow out is performed before the diluted sample is aspirated. Select the blowout option to increase the accuracy of the dilution. The recommended Blow Out volume for the 300 µl GripTip Kit is 10 µl and for the 125 µl GripTip Kit is 1.0 µl.
- **Purge Last Aspirate**: Dispenses the aspiration after the last dilution to the reservoir position. If turned off, the last aspiration is dispensed back into the last column that was diluted.
- **Sample wait**: Wait time between each sample dispense.
- **Aspirate wait**: Wait time after the sample dispense.
- **Dispense wait**: Wait time after each dispense.

Press **SAVE** to continue.

**6) Select the speeds**

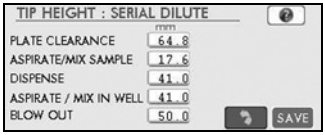
Press the **Speed** button in the **SERIAL DILUTE** menu.




Select the desired dispense speed(s) and press **SAVE**.

**7) Adjust the tip height**

Press the **Tip Height** button in the **SERIAL DILUTE** menu.




- **Plate Clearance**: The height the pipet tips move over the plate when moving from well to well.
- **Mix Sample**: This is the height that the pipet tips mix the sample in the reservoir or in the microwell plate before serial dilute is initiated. Set the Mix Source height in conjunction with the Mix Source volume to ensure no air is aspirated into the pipet tips, see point 5).
- **Dispense**: The height of each column dispense. This height can be set within the microwell plate.
- **Aspirate/Mix In Well**: This is the sample aspiration and mix height within each well.
- **Bow Out**: The height of blow out before the diluted sample is aspirated.

For Teaching procedure see “Teaching procedure for ALL FUNCTIONS:” on page 33.

### 5.3.4 Wash

Select one of the **WASH** options (Direction and Rinse) within the **Toolbox**, see "Wash (optional)" on page 19. Adjust the direction of the aspiration nozzles move or set the Rinse frequency and duration.

Select the **WASH** function from the **MAIN MENU** and set the desired parameters.

**1) Select the wash mode**

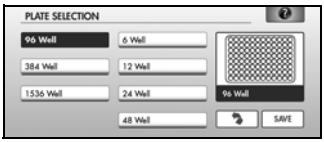
Press the Wash **Function** button in the **WASH** menu and select which wash function to perform.


- **Aspirate**: Only aspirates from wells. No well wash is performed in the Aspirate mode.
- **Washing**: Wash module will dispense wash fluid to the entire plate and then aspirate the fluid from the entire plate.
- **Column Washing**: The wash module will dispense wash fluid to one column and then aspirate the fluid from the same column before washing the next column.

Press **SAVE** to continue.

**2) Select the plate that is located on the deck**

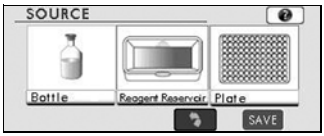
Press the **Plate** option in the **WASH** menu.




Match the plate on the screen to the plate that is seated on the VIAFILL plate deck. After selecting the correct plate, press the **SAVE** button.

**3) Select the source container**

Click on a **SOURCE** option in the **WASH** menu.




Only the **Bottle** can be utilized with the Wash tubing set.

Press **SAVE** to continue.

**4) Select the tubing set**

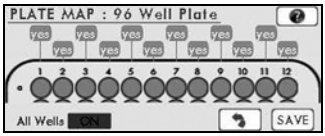
Press the button below **TUBE SET** in the **WASH** menu.


Select the 8- or 16-Channel Washing tubing set. The 8 channel option is used with a 96 well plate. Change the plate selection to a 384 or a 1536 to allow the selection of the 16-Channel Wash tubing set.

Press **SAVE** to continue.

**5) Select which wells to fill**

Press the **Plate Map** option in the **WASH** menu.

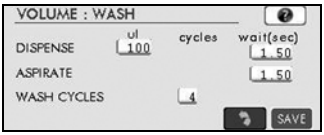



Press the **YES** and **NO** buttons to select and deselect columns. Press the **ALL WELLS** button to select or deselect the entire plate.

Press the **SAVE** button to continue.

**6) Select dispense volume(s)**

Press the **Volume** button in the **WASH** menu.

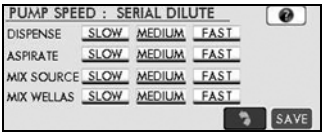



- **Dispense**: This is the volume of wash fluid that is dispensed to each well. The aspiration volume is automatically calculated and performed after each dispense.
- **Wash cycles**: Number of wash cycles for column or plate wash.
- **Wait (sec)**: Wait time before each dispense or aspiration.

Press **SAVE** to continue.

**7) Select the speeds**

Press the **Speed** button in the **WASH** menu.




Select the desired dispense speed(s) and press **SAVE**.

**8) Adjust the tip height**

Press the **Tip Height** button in the selected pipetting menu.


- **Plate Clearance**: The height the Wash aspiration nozzles move over the plate when moving from column to column.
- **Dispense**: The height that the dispensing cassette parks while the wash fluid is dispensed.
- **Pre Dispense**: The height that the Wash tubing cassette dispenses over the waste reservoir before beginning the Wash. This function assures that there is no air in the dispensing tubing set.
- **Aspirate Start**: This is the height that the aspiration nozzles start aspirating the wash fluid from each well. Set this height slightly below the height of the Wash volume for each well.
- **Aspirate**: This is the height that the aspiration nozzles stop aspirating the wash fluid from each well. Set this height to the bottom of the microwell plate.

For Teaching procedure see “Teaching procedure for ALL FUNCTIONS:” on page 33.

## 5.4 Special functions - dispensing cassette only

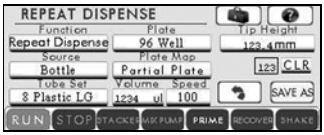
### 5.4.1 Prime

***NOTE***

*This function is only available with standard dispensing cassette. The GripTip pipet tip tubing set does not require system fluid. The GripTip tubing sets function correctly with no liquid column. As a result, the user interface will not allow the PRIME function to be used when the GripTip tubing set is selected.*

Before priming the dispensing cassette, set the prime height in the **TOOLBOX**, see "Prime/purge" on page 16.

A prime needs to be performed before the standard dispensing cassettes can be used for dispensing. The prime function draws the bottle source fluid through the tubing sets and prepares the tubing set for dispensing.



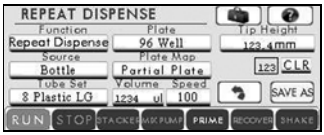

Enter the MAIN screen for the method being performed (Repeat Dispense or Variable Dispense).

Hold the **PRIME** button shown here until the source fluid is dispensed from all dispensing cassettes nozzles.

### 5.4.2 Recover

Before using the recover function; set the recover height in the toolbox, see "Recover" on page 18.

The recover function should be used when users are finished using the VIAFILL standard dispensing cassettes. This function reverses the pump motion and pulls the reagent back into the source container. The recover function is only available in the Repeat Dispense and Variable Dispense modes.




Enter the Main function screen for the method being performed (Repeat Dispense or Variable Dispense).

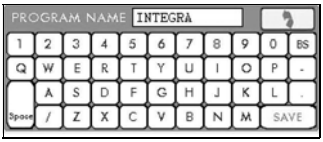
Hold the **RECOVER** button until the reagent is completely removed from the dispensing cassette.

## 5.5 Programs

### 5.5.1 Save a program

You should save programs as custom programs to maintain the parameter settings, especially the tip height values. From the **Repeat Dispense**, **Variable Dispense**, **Serial Dilute** or **Wash** main menus, press **SAVE** to store the current parameters.


Press **SAVE AS** to save the parameters with a custom name. The screen beside will appear. Select which custom program position to overwrite.




The keypad will appear to enter a custom name.

Once the Custom name is entered, press **SAVE**.

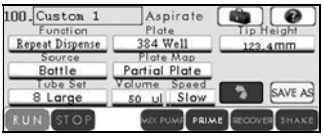
### 5.5.2 Copy a program

From the the **MAIN MENU** select one of the **CUSTOM** programs. Change all desired parameters and save the program with a new custom name.

### 5.5.3 Custom programs

In addition to saving a program as a custom program, the VIAFILL software allows the user to start with a blank custom program. This allows a user to select the function (Repeat Dispense, Variable Dispense, Serial Dilution or WASH). All other settings should be chosen the same as any other program mode.

**Open a new custom program**




Select any of the 95 **CUSTOM** buttons from the **MAIN MENU**. This will take you to the Custom programming main screen.

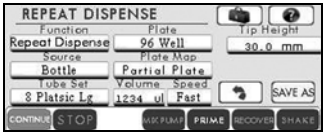
**Select the desired function**

Unlike the other modes, the **Function** key can be changed in custom programming. Press the function key and select the desired function. This will determine which options are available. (Tubing sets, plates and source containers).

To complete the rest of the function programming see the individual programming instructions for each option (5.3).

Finally, name the custom program. Press the Custom text box to display the keypad, enter the desired Custom name and press **Save**.

### 5.5.4 Run a program

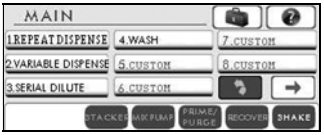



After the parameters are set, press the green **RUN** to start the repeat dispense.

Press the **STOP** button at any time to pause the program.

Once the program is paused, press **CONTINUE** to resume or **END** to cancel the program.

**Plate shaker**




The ability to SHAKE microwell plates in available on all VIAFILL base units. Shaking plates helps to homogenize the reagent while simultaneously reducing air bubbles within the reagent. Simply hold down the **SHAKE** button to shake plates. The **SHAKE** button is located on the VIAFILL main menu and in all function main menus (Repeat Dispense, Variable Dispense, Serial Dilute and Wash).

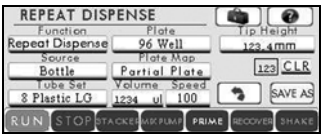
## 5.6 Stacker function (optional)

The VIAFILL plate stacker allows for microwell plates to be stored, dispensed to and then restacked.

Press the **HOME** button to sync the stacker and the VIAFILL. The Stacker is designed to work with the **REPEAT DISPENSE** and **VARIABLE DISPENSE** functions. Select either of these or a Custom program to begin.

Use the GripTip kit with the stacker when in-plate serial dilutions should be performed. The Stacker will not function if used with the Wash tubing set. If the stacker intended to use as a bulk reagent dispenser, install the standard dispensing cassettes.

Only the **Bottle** can be utilized as source container. The VIAFILL stacker is also capable of stacking plates with lids and deep well blocks. Simply adjust the tip height within the repeat or variable dispense menu to use the stacker with plates of differing heights.




The stacker plate counter is shown on the right side of the **Repeat Dispense** and **Variable Dispense** screens (CLR).

### 5.6.1 Stacker program modes

**Lid stack:**
Press the LIDS option on the front panel of the stacker (50) to activate the plate/lid function. This will remove lids from each plate, store it, dispense to the plate and then replace the lid before stacking. Turn this function ON or OFF at any time by pressing the button.

Use the arrow Keys are used to adjust the plate height. The plate height is measured from bottom to top without lid or from bottom of plate to bottom of lid for lidded plates.

**Plate Re-stack**
Press the RE-STACK button on the front panel of the stacker (49) to activate the plate restack function. After filling all plates, the stacker will then re-stack the plates back to the first chimney position. This ensures that the microwell plates return to the same order that they were loaded in.

## 5.7 Troubleshooting/FAQ

### 5.7.1 VIAFILL base unit

| Problem | Probable cause | Remedy |
|---|---|---|
| Peristaltic pump does not rotate. | Tubings are not correctly positioned on the roller wheel. | Turn off VIAFILL. See section 3.2.1 to confirm the tubing set is installed correctly. |
| Plate mover does not move. | Software malfunction. | Switch the device off and on. Contact service technician. |
| Position error of pipetting arm. | Tip heights defined too low. | Define appropriate clearance heights. See section 5.4 for how to adjust tip heights. |
| The dispensing nozzles / GripTips do not line up with the center of the wells. | The stage alignment has not been set correctly. | Select the Stage Alignment option in the toolbox. See section 3.3.6 for how to adjust the stage alignment. |
| The desired height was not saved. | The height was not entered correctly. | Once the desired height is selected, press ENTER and then press SAVE. This will ensure the height is saved properly. |
| The 384 stage alignment does not allow the dispensing nozzle to reach the center of both wells on a 384 well plate. | Belt movement malfunction. | Contact service technician. |

### 5.7.2 Stacker

| Problem | Probable cause | Remedy |
|---|---|---|
| The stacker does not communicate with the VIAFILL. | The stacker option was not activated in the toolbox. | Got to the stacker option in the red toolbox. Turn the stacker option ON. Restart both the VIAFILL and Stacker. |
| | The RS232 cable is not connected properly. | Connect the RS232 cable as described in section |
| The lid function is not working properly. | Incorrect lid height entered into plate lid height option on the front stacker panel. | Enter the correct height (in mm) from the bottom of the well plate to the bottom of the lid. |
| The RUN button will not activate the VIAFILL / Stacker. | The plate counter has reached the limit 999. | Reset the plate counter. |

### 5.7.3 Washer

| Problem | Probable cause | Remedy |
|---|---|---|
| The Wash Module will not run. | The Wash mode might not be selected. | In the function screen select, Aspirate, Washing or Column Washing. The wash module will not operate unless one of these is selected. |
| The wash tubing cassette is not dispensing / aspirating. | Installation error. | See section 4.1.3 for installation instructions or contact a service technician for a detailed installation guide. |
| The wash tubing cassette is not aspirating. | No vacuum created in waste container. | Make sure plastic cap is on the waste container lid opening not in use by the two tubes. |

# 6 Maintenance

## 6.1 Washing the dispensing cassettes


***CAUTION***

*Handle the dispensing cassettes with great care so that the tubes and tips not get damaged. When operating with small bore dispensing cassettes, ensure that the liquid does not contain any particles > 50 µm.*

For a break of one day or longer, empty the tubings by pressing the **Recover** button. Wash the cassette by priming it with deionized water or, if necessary, with washing detergent followed with deionized water. Ensure that all tubings are washed properly. Empty the tubings by pressing **Recover**. The cassette can be dried at room temperature. Press the green **PUSH** button (23) on the front of the pump head (2) to lower the housing. Release the tubing tension by pressing the silver lever (23) into the down position.


***CAUTION***

*The tubing tension should be released whenever the VIAFILL is not in use!*

## 6.2 Cleaning the VIAFILL

***WARNING***

*Always turn off power and unplug the power supply before cleaning the exterior.*

*Spilt fluids can damage the outer surface and internal components.*

For reliable daily operation, keep the VIAFILL free of dust and liquid spills. Clean the external components periodically with a moistened lint-free cloth or Kim wipe lightly soaked with mild soap solution in distilled water. Also, a 70% dilution of Isopropyl or Ethanol alcohol mix can be used. The materials used on the exterior of the VIAFILL support regular cleaning intervals.
Immediately wipe away spilt acids, solvents, alkaline or saline solutions to prevent damage.

## 6.3 Decontamination of the VIAFILL

Decontamination is not required for the proper functioning of the VIAFILL. Only if any surfaces have been in direct contact with biohazardous material, they must be decontaminated in accordance to good laboratory practice, e. g. with the following disinfectants:

- Ethanol 70 %
- Microcide SQ 1:64
- Glutaraldehyde solution 4%
- Virkon solution 1-3%

Follow the instructions provided with the reagents.

## 6.4 Decontamination of the dispensing cassettes

The pipetting heads are autoclavable along with the dispensing cassette holder. Dispensing cassettes, tubing and wash sets can be autoclaved a maximum of ten times each at 1 bar pressure at 121 °C for 20 min. Replace dispensing cassette after ten autoclave cycles!


***CAUTION***

*After autoclaving, the dispensing cassettes must cool down to room temperature before use.*

*Do not autoclave any other parts of the VIAFILL than specified.*

Alternatively, the dispensing cassettes can be decontaminated in Virkon 1-3%, Ethanol 70 % or glutaraldehyde 4% solution for 10 minutes. Afterwards rinse them with deionized water.

## 6.5 Cleaning the tips

***NOTE***

*Place the source tubing in a separate bottle filled with deionized water to prevent particles re-entering the reagent.*

If any tips of the standard dispensing cassettes are clogged, try one of the following procedures:

- Rinse the tips by pressing the **Recover** and the **Prime** button alternatively for a few seconds.
- Fill the reagent reservoir with deionized water and let the tips submerged for a few minutes. Press the **Recover** button.
- Dismount the dispensing cassette. Fill a 20 ml syringe with deionized water or ethanol, attach a round sterile filter and put a suitable short tubing on the syringe and on the outlet of the tip. Press liquid through the syringe. To verify the cleaning, put the tubing to the tip inlet and check if liquid is coming out of the tip while pressing liquid through.

## 6.6 Servicing

It is recommended to service the VIAFILL at least yearly. If liquid ever enters the internals of your VIAFILL, please contact INTEGRA Biosciences US for service advice.

***WARNING***

*If working with infectious materials, e. g. human pathogens, VIAFILL needs to be decontaminated before sending them to service and the declaration on the absence of health hazards must be signed. This is necessary to protect service personnel.*

## 6.7 Calibration

The VIAFILL and each tubing set is calibrated by the manufacturer to ensure that each channel is accurate. You can gravimetrically determine the accuracy of an entire dispensing cassette, i. e. the ability of the pump to dispense the exact volume desired.

Weigh a micro plate and dispense distilled water into the first column using the repeat dispense function. Weigh the plate again and calculate the weight of the actual volume. Repeat this procedure with a calibrated pipette and calculate the weight of the target volume. Determine the percent deviation of the actual to the target weight and adjust the calibration factor, see "Pump calibration" on page 19, if necessary.

The VIAFILL can also be calibrated by your service technician. This includes gravimetric accuracy verification, photometric precision verification and gravimetric calibration. Please contact INTEGRA Biosciences Corporation.

## 6.8 Equipment disposal

The VIAFILL is labelled with the “crossed-out wheeled bin” symbol to indicate that this device must not be disposed of with unsorted municipal waste. Instead, it is your responsibility to correctly dispose of your waste equipment by handing it over to an authorised facility for separate collection and recycling. It is also your responsibility to decontaminate the device in case of biological, chemical, and/or radiological contamination so as to protect from health hazards the persons involved in the disposal and recycling of equipment.

For more information about where you can drop off your waste equipment for recycling, please contact your local dealer from whom you originally purchased the product or your local council.

By doing so, you will help conserve natural resources and you will ensure that your waste equipment is recycled in a manner that protects human health and the environment. Thank you!

# 7 Technical Data

## 7.1 Environmental conditions

| | Operation |
|---|---|
| Temperature range | 5–35 °C |
| Humidity range | < 80 % RH non-condensing |
| Altitude range | < 2000 m |

## 7.2 Specification of the device

| | |
|---|---|
| Dimensions (L x W x H) | 37.5 cm x 30.5 cm x 24.0 cm (14.76” x 12.00” x 9.45”) |
| VIAFILL weight | 10.66 kg (23.5 lbs) |
| Power requirements | 100–240 VAC, 50/60 Hz |
| Dispense speeds | 18 seconds (100 µl to 96 well) |
| Compatible plate formats | 6, 12, 24, 48, 96, 384, 1536 Shallow & Deep Well Plates |
| Volume range | 0.5 µl to 9.999 µl |
| Bore size of plastic tubing sets | Small: 0.3 mm (0.012”), large: 0.5 mm (0.018”) |
| User interface | Touch Screen |
| Amperage rating | 0.8 Amp Max |
| Voltage tolerance | ±10% |
| Outlet type | VIAFILL must use grounded outlets only! |
| Fuse rating | AC250V,T3.15AL |

## 7.3 Dispense speed

| Dispensing option | Well plate | 1 µl | 10 µl | 50 µl | 100 µl |
|---|---|---|---|---|---|
| 8 Channel small bore cassette | 96 well | 5.6 s | 7.6 s | 15.1 s | 23.8 s |
| 8 Channel small bore cassette | 384 well | 11.9 s | 17.9 s | 47.7 s | 84.5 s |
| 8 Channel standard bore cassette | 96 well | NA | 5.8 s | 7.3 s | 9.8 s |
| 8 Channel standard bore cassette | 384 well | NA | 11.6 s | 18.3 s | 26.2 s |
| 16 Channel small bore cassette | 384 well | 7.6 s | 10.4 s | 25.5 s | 43.7 s |
| 16 Channel small bore cassette | 1536 well | 17.6 s | 30.5 s | NA | NA |
| 8 Channel 300 µl GripTip Kit | 96 well | NA | 20.2 s | 27.4 s | 44.8 s |
| 8 Channel 300 µl GripTip Kit | 384 well | NA | 45.5 s | 99.9 s | 171.7 s |
| 16 Channel 300 µl GripTip Kit | 384 well | 5.6 s | 7.6 s | 15.1 s | 23.8 s |

Dispense speed: fast
Dispense direction: straight
Mode: Repeat dispense

## 7.4 Dead volumes for dispensing cassetes

| Dispensing cassette | Part No. | Dead volume per tube | Dead volume per cassette |
|---|---|---|---|
| 8 Channel small bore | 5722 | 200 µl | 1.60 ml |
| 8 Channel standard bore | 5724 | 860 µl | 6.88 ml |
| 16 Channel small bore | 5742 | 200 µl | 3.2 ml |

## 7.5 Specification of the stacker (optional)

| | |
|---|---|
| Dimensions footprint (W x D) | 78.9 cm x 32.1 cm (31.06” x 12.64”) |
| Base unit weight | 27 kg |
| Power requirements | 100–240 VAC, 50/60 Hz |
| 25 Plate chimney height | 7.2 cm |
| 50 Plate chimney height | 10.2 cm |
| Interface cable | RS232C |
| Detection method | Optical sensor |

## 7.6 Accuracy and Precision Specifications

**Dispensing cassettes:**

| | Volume | Accuracy | Precision | Recommended |
|---|---|---|---|---|
| 8 channel small bore | 100 µl | ±1.5% | ≤1.0% | 1000 plates |
| | 2.0 µl | ±3.0% | ≤4.0% | |
| 8 channel standard bore | 200 µl | ±1.5% | ≤1.0% | 2000 plates |
| | 5.0 µl | ±2.0% | ≤3.0% | |
| 16 channel small bore | 100 µl | ±1.5% | ≤1.0% | 1000 plates |
| | 2.0 µl | ±3.0% | ≤4.0% | |

**GripTip tubing cassettes:**

| | Volume | Accuracy | Precision | Recommended |
|---|---|---|---|---|
| 8 channel GripTip Kit | 300 µl | ±2.0% | ≤1.5% | 400 plates |
| | 100 µl | ±2.0% | ≤1.5% | |
| | 25 µl | ±4.0% | ≤2.0% | |
| 16 channel GripTip Kit | 125 µl | ±2.0% | ≤1.5% | 200 plates |
| | 40 µl | ±2.0% | ≤1.5% | |
| | 10 µl | ±5.0% | ≤3.0% | |

# 8 Accessories and consumables

## 8.1 Accessories

| Accessories | | Part No. |
|---|---|---|
| External Mixing Pump | to keep cells in suspension by gentle circulation | 5905 |
| Plate Stacker | base unit | 5910 |
| Plate Stacker Chimney | 25 plate capacity (1 each) | 5915 |
| | 50 plate capacity (1 each) | 5916 |
| Wash module | for plate washing in combination with wash set 5960 or 5965 | 5950 |
| 8 channel wash set | for use with wash module | 5960 |
| 16 channel wash set | for use with wash module | 5965 |

## 8.2 Consumables

| Dispensing cassettes | | Part No. |
|---|---|---|
| 8 channel, small bore | plastic dispensing cassette, sterile, 0.5–999 µl, 5 per case | 5722 |
| 8 channel, standard bore | plastic dispensing cassette, sterile, 5–999.9 µl, 5 per case | 5724 |
| 16 channel, small bore | plastic dispensing cassette, sterile, 0.5–999 µl, 5 per case | 5742 |

| GripTip kits | | Part No. |
|---|---|---|
| **8 channel GripTip kit** | enables use of 300 µl GripTips, includes 5821, 5822, 5823 | 5820 |
| 8 channel tubing set | to connect 8 channel pipetting head | 5821 |
| 8 channel pipetting head | for the use of 300 µl GripTips | 5822 |
| GripTip adaptor | for the installation of the pipetting head on the base unit | 5823 |
| **16 channel GripTip kit** | enables use of 125 µl GripTips, includes 5841, 5842, 5823 | 5840 |
| 16 channel tubing set | to connect 16 channel pipetting head | 5841 |
| 16 channel pipetting head | for the use of 125 µl GripTips | 5842 |
| GripTip adaptor | for the installation of the pipetting head on the base unit | 5823 |

| GripTips | | Part No. |
|---|---|---|
| **125 µl GripTips** | 5 inserts of 384 tips, non-sterile, GREEN CHOICE | 4422 |
| | 5 boxes of 384 tips, non-sterile | 4423 |
| | 5 boxes of 384 tips, sterile | 4424 |
| | 5 boxes of 384 tips, sterile, filter | 4425 |
| | 5 boxes of 384 tips, pre-sterilized GREEN CHOICE | 4426 |
| **300 µl GripTips** | 5 inserts of 96 tips, non-sterile, GREEN CHOICE | 4432 |
| | 5 boxes of 96 tips, non-sterile | 4433 |
| | 5 boxes of 96 tips, sterile | 4434 |
| | 5 boxes of 96 tips, sterile, filter | 4435 |
| | 5 boxes of 96 tips, pre-sterilized GREEN CHOICE | 4436 |