Thermo Scientific
Wellwash® Versa
User Manual

Rev. 1.0

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User Manual

Rev. 1.0, Cat. no. N11166

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SCIENTIFIC

About This User Manual

Intended users

The Wellwash Versa microplate washer can be used as standalone in research and routine-test laboratories by professional personnel.

How to use this user manual

This user manual is for the following instruments, Wellwash Versa: Cat. no. 5165010 and 5165030. It has been designed to give you the information you need for:

- Reviewing safety precautions
- Installing the instrument
- Navigating in the user interface
- Operating the instrument
- Programming of wash protocols
- Defining of wash parameters
- Performing cleaning and maintenance procedures
- Troubleshooting the instrument performance

This user manual also describes all the features and specifications of the Wellwash Versa instrument as well as ordering information.

Read the manual in its entirety before operating the instrument.

Keep the user manual for future reference. The user manual is an important part of the instrument and should be readily available during use of the instrument. Keep the user manual together with the instrument in case you distribute it onwards.

For more information

For the latest information on products and services, visit our websites at:

http://www.thermoscientific.com
http://www.thermoscientific.com/mpi
http://www.thermoscientific.com/readingroom
http://www.thermoscientific.com/wellwash

In our efforts to provide useful and appropriate documentation, we appreciate your comments on this user manual to your local Thermo Fisher Scientific representative.

Safety symbols and markings

These symbols are intended to draw your attention to particularly important information and alert you to the presence of hazards as indicated.

Safety symbols and markings used on the Wellwash Versa

The following symbols and markings appear on the type label and the instrument itself.
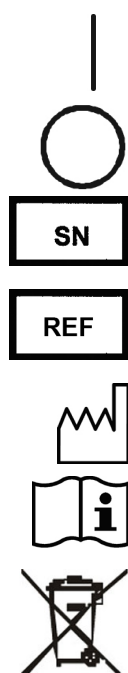
Power ON ▲

Power OFF ▲

SN **Serial number ▲**

REF **Catalog number ▲**

Date of manufacture ▲

Consult instructions for use ▲

WEEE symbol This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2002/96/EC. ▲

A black label with the following text (Figure 2–3 on page 16):

CAUTION: WARNING: DISCONNECT SUPPLY BEFORE SERVICING and AVERTISSEMENT: COUPER L'ALIMENTATION AVANT L'ENTRETIEN ET LE DEPANNAGE. ▲

Warning and other markings used in the documentation

The following symbols and markings appear in this user manual.

Warning Risk of electric shock. ▲

Warning Biohazard risk. ▲

Warning Risk of injury to the user(s). ▲

Caution Risk of damage to the instrument, other equipment or loss of performance or function in a specific application. ▲

Note Marks a hint, important information that is useful in the optimum operation of the system, or an item of interest. ▲

Contents

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Chapter 1
Introduction to the Wellwash® Versa Microplate Washer

The Wellwash Versa (Figure 1-1) is a microplate washer. It is designed to use both 96- and 384-well plate formats: the 96-well plate in both landscape and portrait orientation, and the 384-well plate in landscape orientation. The 96-well plates and strips are designed to be washed in 1 x 8, 2 x 8, 1 x 12, or 2 x 12 format and the 384-well plates in 1 x 16 format. The instrument also allows shaking during soaking. The instrument has an intuitive graphical user interface. In addition, the Wellwash Versa can be connected to plate handling devices.

The Wellwash Versa can be used to wash and prepare plates for a variety of test routines, mainly in enzyme-linked immunosorbent assay (ELISA) tests.

The Wellwash Versa is available in the following configurations:

- Wellwash Versa 100-240V (Cat. no. 5165010)
  - 96- and 384-well plate washing
- Wellwash Versa 100-240V (Fisher Scientific, Cat. no. 5165030)
  - 96- and 384-well plate washing

Figure 1-1. Wellwash Versa microplate washer

Intended use   The Wellwash Versa is a microplate washer intended for automated washing, aspiration, dispensing and shaking of 96- and 384-well plates and strips that meet ANSI/SBS standards. The instrument can be

equipped with up to four liquid containers. It can be used in research or routine-test laboratories by professional personnel.

The Wellwash Versa is part of an analyzing system for the end user, who is thus responsible for validation of the whole system in order to produce reliable and safe results. If the analyzing performance is critical for medical diagnosis, the diagnostic test result has to be checked using internal quality controls or with a corresponding test. We recommend using Good Laboratory Practices (GLP) during the analyzing process.

Use for self-testing is excluded.

Chapter 2
Wellwash Versa Main Parts

This chapter describes the main parts of the Wellwash Versa instrument.

Instrument views

The front view of the Wellwash Versa instrument is shown in Figure 2–2.

Figure 2–2. Wellwash Versa front view with accessories

The back view of the Wellwash Versa instrument is shown in Figure 2–3.

USB port for memory stick

ON/OFF switch

Power supply connector

Serial RS-232 C port

USB port for PC

Figure 2–3. Wellwash Versa back view

The side views of the Wellwash Versa instrument are shown in Figure 2–4.

USB port for memory stick

Connectors for liquid
sensor cables,
from top to bottom:
W (Waste),
Rinse,
B (Buffer B), and
A (Buffer A)

Connectors for liquid container tubes,
from left to right:
W (Waste), Rinse, B (Buffer B), and A (Buffer A)

Left   Right

ON/OFF switch
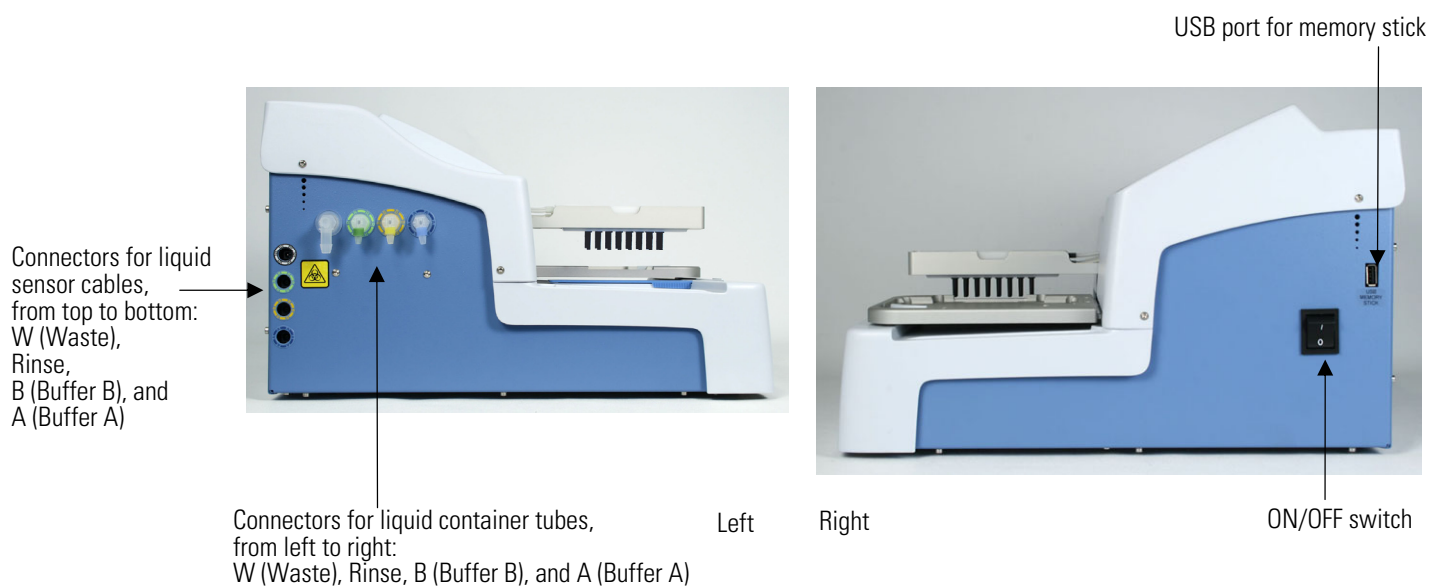
Figure 2–4. Wellwash Versa side views

Liquid system diagram
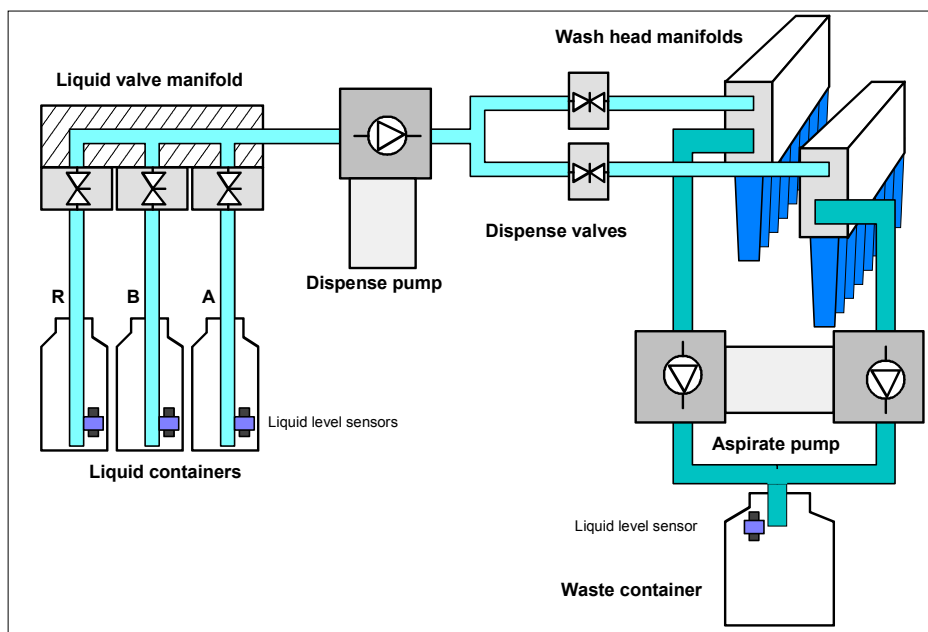
USB memory stick port

The instrument is equipped with a USB port (host) for an external memory stick (Figure 2–4). You can transfer wash protocols from one instrument to another of the same model with the USB memory stick.

USB PC port

The instrument is equipped with a USB port (client) for an external PC connection. The connection is used for remote control and service of the instrument. A separate manual, *Wellwash Versa Remote Control Command Sets* (Cat. no. D08894), is available upon request.

Plate carrier

The plate carrier of the Wellwash Versa instrument supports both portrait and landscape orientation of the plate (Figure 2–2). A plate clamp is incorporated into the plate carrier to keep the plate firmly positioned during processing. A sensor in the plate clamp senses the presence of a microplate.

Wash heads

The wash head alternatives (Figure 2–5) and their configurations (Figure 2–6) are shown below.
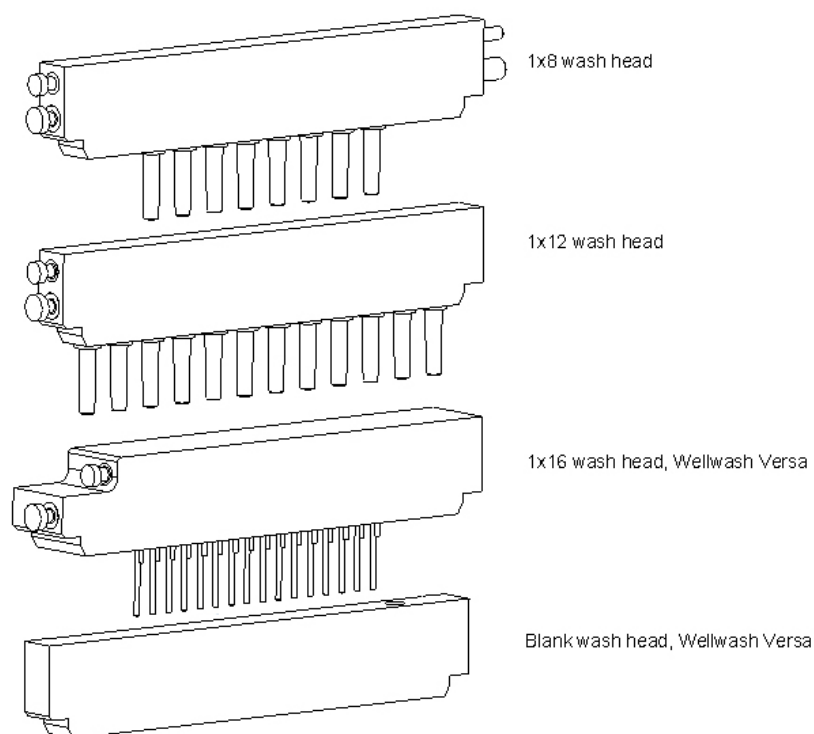
Figure 2–5. Wellwash Versa wash head models
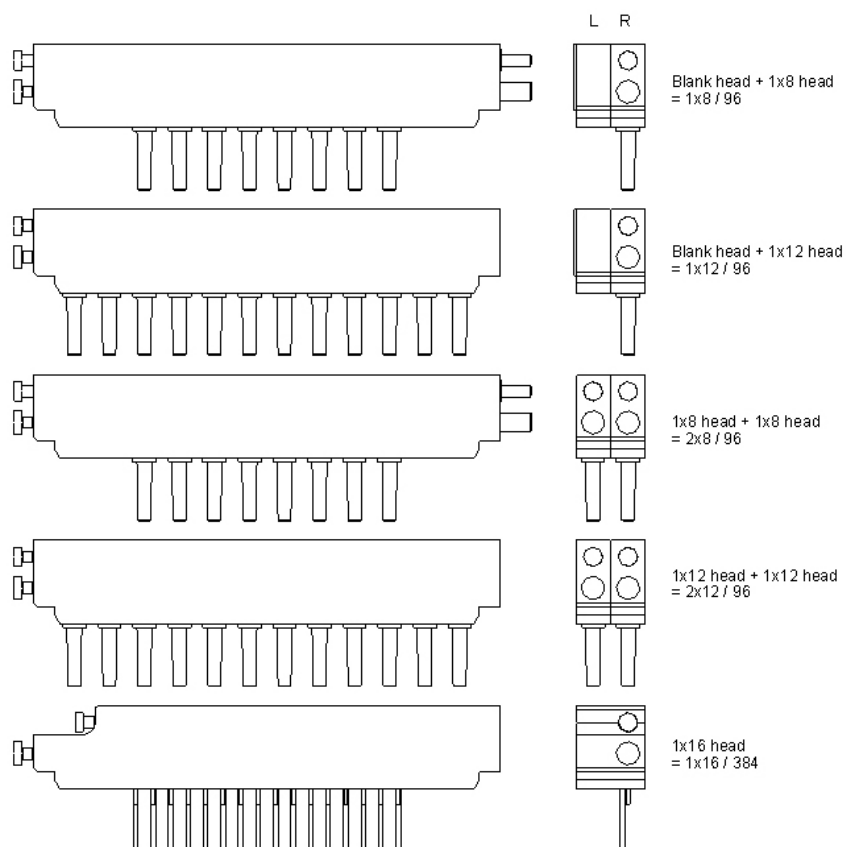
Figure 2–6. Configurations of Wellwash Versa wash heads

Shaker

The linear shaker operates at three different speeds (Table 2–1):

Table 2–1. Shaking speeds

Speed designation	Speed
Low	5 Hz, amplitude 2.5 mm
Medium	10 Hz, amplitude 1.5 mm
High	15 Hz, amplitude 1 mm

Wellwash Versa Main Parts

Shaker

Chapter 3
Installation

This chapter describes the installation procedures for the Wellwash Versa instrument.

Warning The Wellwash Versa weighs 9 kg [19.8 lbs.] and care must be taken when lifting the instrument. ▲

What to do upon delivery

This section covers the relevant procedures to be carried out on receipt of the instrument.

Unpacking the instrument

Move the packed instrument to its site of operation. To prevent condensation, the instrument should be left in its protective plastic wrapping until the ambient temperature has been reached. Unpack the Wellwash Versa instrument and accessories carefully with the arrows on the transport package pointing upwards. Place the instrument onto a laboratory bench.

Caution Do not touch or loosen any screws or parts other than those specifically designated in the instructions. Doing so may cause misalignment and will invalidate the instrument warranty. ▲

Retain the original packaging for future transportation. The packaging is designed to assure safe transport and minimize transit damage. Using other packaging materials may invalidate the warranty. Also retain all instrument-related documentation provided by the manufacturer for future use.

If you relocate your instrument or ship it for service, refer to "Packing for service" on page 105.

Checking delivery for completeness or damage

Check the enclosed packing list against the order. Visually inspect the transport package, the instrument and the accessories for any possible transport damage. If any parts are missing or damaged, contact your local Thermo Fisher Scientific representative or Thermo Fisher Scientific Oy.

Environmental requirements

When you set up your Wellwash Versa, avoid sites with excess dust, vibrations, strong magnetic fields, direct sunlight, draft, excessive moisture or large temperature fluctuations. Make sure that:

- The working area is flat, dry, clean and vibration-proof, and leave additional room for cables, covers, and so on

- The ambient air is clean and free of corrosive vapors, smoke and dust

- The ambient temperature range is between +10°C (50°F) and +40°C (104°F)

- The humidity is low so that condensation does not occur (relative humidity is between 10% and 80%, non-condensing).

Caution Do not operate the instrument in an environment where potentially damaging liquids or gases are present. ▲

Installation setups

This section describes the procedures that must be carried out before instrument operation.

Caution Leave the instrument to stand for at least three hours before installing and switching it on, so there is no possibility of condensation causing a short circuit. ▲

Warning All parts of the instrument that come into contact with potentially infectious materials must be treated as potentially infectious areas.
It is advisable to adhere to applicable safety precautions, including the wearing of powder-free gloves, safety glasses and protective clothing, to avoid potential infectious disease contamination when performing cleaning procedures and also when making adjustments to the instrument. ▲

Releasing the transport lock

The instrument comes with one transport lock.

Caution Make sure that the transport lock has been released before you put the instrument into operation. ▲

To release the transport lock:

1. Remove the padded packing material protecting the wash head arm and plate carrier to expose the transport lock and transport lock tag (Figure 3–7).

Figure 3–7. Transport lock and transport lock tag

2. Unscrew the transport lock screw with the supplied Allen key (Figure 3–8).

Figure 3–8. Unfastening the transport lock

3. Keep the transport lock and tag (Figure 3–9) for future relocation or transportation of the instrument.

Figure 3–9. Transport lock and tag removed

<table>
<tr><td>

Removing the priming vessel

</td><td>

The instrument comes with the priming vessel installed. The priming vessel is correctly installed if it stays in place and does not move up.

To remove the priming vessel:

1. Push the priming vessel away from yourself towards the instrument until you hear a snap.

2. Lift the priming vessel up and remove it (Figure 3–10).

</td></tr>
</table>

Figure 3–10. Removing the priming vessel

Warning The priming vessel may be infectious after the instrument has been used. ▲

Installing the wash head(s)

The wash heads are packed separately and must be installed before use.

Warning The wash heads may be infectious after the instrument has been used. ▲

Note Always wear disposable powder-free gloves when handling the wash heads. ▲

To install the wash head(s):

1. Fit the wash heads to the tubing according to Figure 3–11 and Figure 3–12. Note the difference in sizes.

   - The larger thicker tube is the aspiration (waste) tube and is connected to the bottom hole.

   - The smaller tube is the dispensing tube and is connected to the top hole.

- Apply silicone grease to the O rings of the tubes if necessary.

- The small and large tube on the left side are blue for easier recognition.
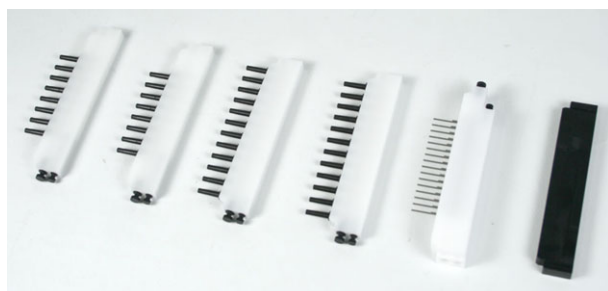
A
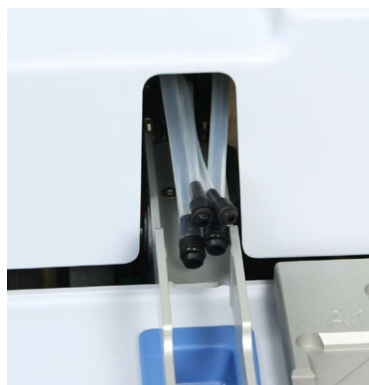
B

Figure 3–11. Wash heads (A) and tubes (B)

2. Fit the wash heads next to each other onto the wash arm (Figure 3–12).
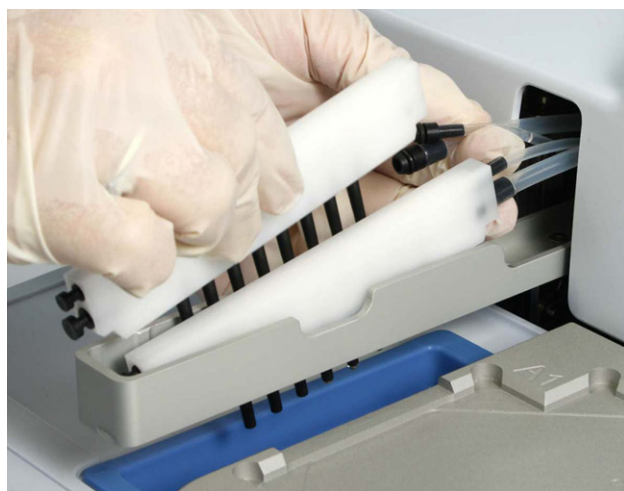
Figure 3–12. Fitting the 2 x 8 wash heads next to each other onto the wash arm

3. Check that the wash heads are evenly inserted (Figure 3–13).
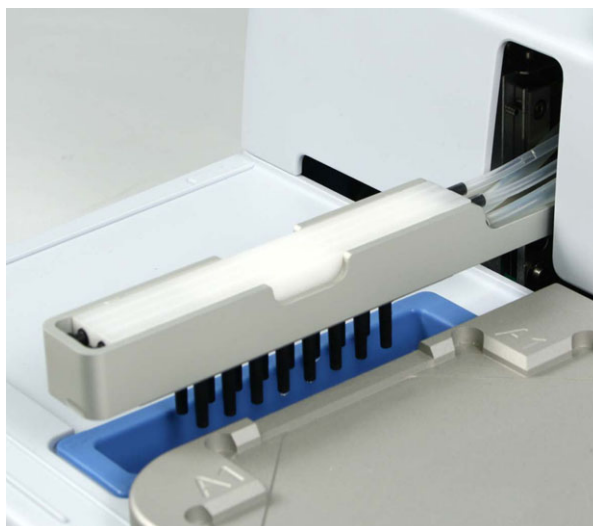
Figure 3–13. 2 x 8 wash heads evenly inserted

4. Ensure that the wash heads are in the correct order (Figure 3–14).

5. If only one wash head (1 x 8 or 1 x 12) is used, place the blank wash head onto the left of the wash arm.

Figure 3–14. Fitting the blank wash head onto the left of the wash arm

6. Enter the new wash head configuration in the **Settings** menu to correspond to the installed wash head.
    The information is used to check for protocol wash head mismatches. Refer to "Wash head configuration" on page 70.

Liquid containers and channels

The Wellwash Versa includes three standard buffer containers (2 liters) and a waste container (4 liters). Containers for greater volumes are available as an option (4 l for buffers and 10 l for waste).

The liquid channels are: **A** (for Buffer A), **B** (for Buffer B), **R** (for Rinse), and **W** (for Waste). Channel R is primarily intended for rinsing and is connected to the **RINSE** key as the only channel. The Rinse channel can also be used in wash protocols as the buffer source.

The liquid containers are named and the tubing is color coded to correspond to the correct buffer source (**A** = **blue**, **B** = **yellow**, **R** = **green**, and **W** = **colorless**) (Figure 3–15). Refer to "Connection diagram" on page 28.

Venting holes

Figure 3–15. Waste and liquid containers with liquid level detection sensors

Caution Do not cover the venting holes. ▲

Connection diagram   Figure 3–16 shows the connections of the liquid level sensor cabling and liquid container tubing.
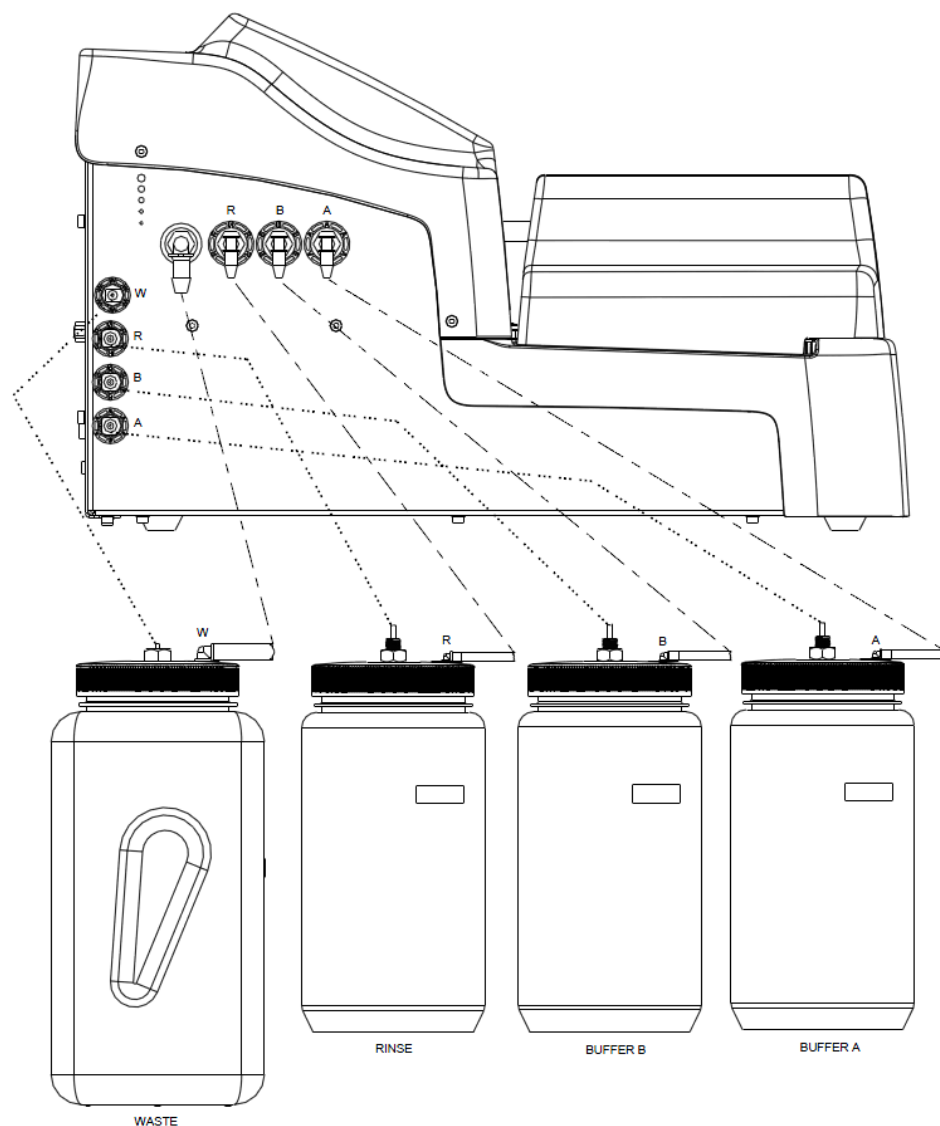
Figure 3–16. Wellwash Versa connection diagram

Installing the liquid containers   To install the liquid containers:

1. Fit the liquid container tubing to the corresponding color-coded tube connectors on the left side panel of the instrument (Figure 3–17). The connectors are from left to right: W (Waste), R (Rinse), B (Buffer B), and A (Buffer A).
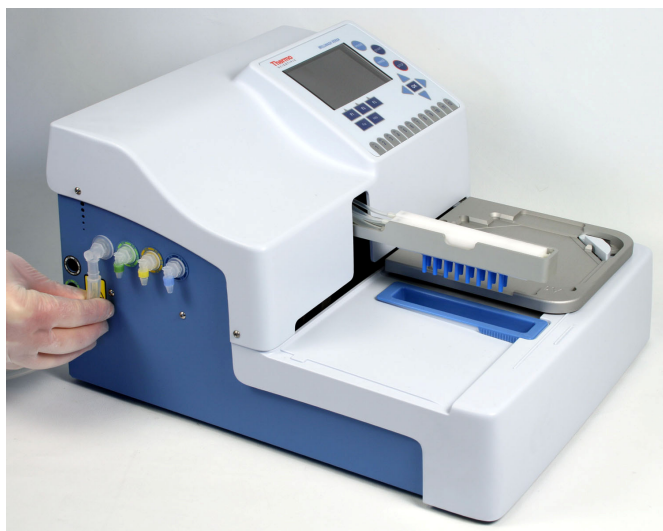
Figure 3–17. Connecting the liquid container tubing

2. Connect the liquid sensor cables into the appropriate color-coded
    sockets on the left side panel of the instrument (Figure 3–18). The
    sockets are from top to bottom: W (Waste), R (Rinse), B (Buffer B),
    and A (Buffer A).
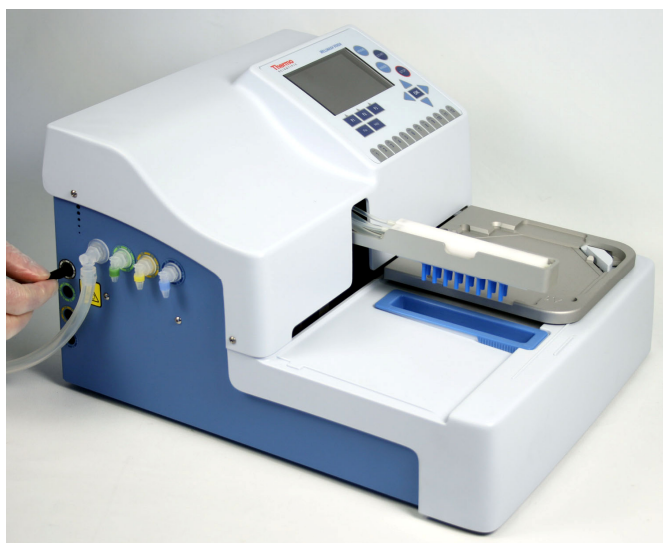
Figure 3–18. Connecting the liquid sensor cable

All the liquid containers are connected to the instrument in
Figure 3–19.
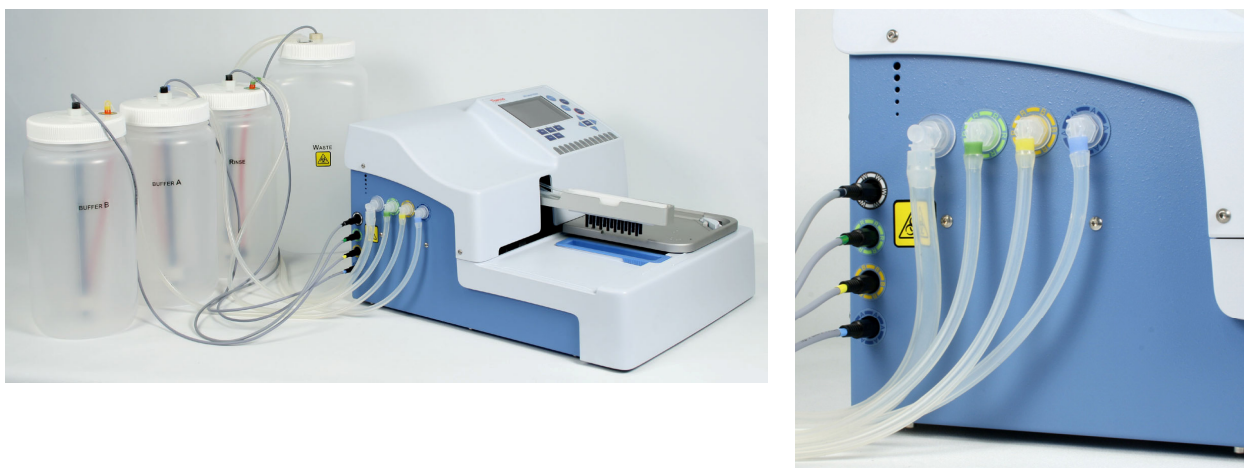
Figure 3–19. Liquid containers connected to the instrument

Caution Always ensure that the liquid containters are attached properly. Always connect the container cap to the correct container and to the correct connector on the left side of the instrument. Otherwise the wash performance can be seriously affected. ▲

Caution Ensure that the intake tube is all the way down at the bottom so that no red tubing is visible. ▲

Caution Ensure that the container of the priming solution is always full at the beginning of the priming procedure. ▲

Caution Check regularly that the inlet filters in the liquid tubes are clean. ▲

Warning Make sure that the liquid level of the waste bottle is always kept below the maximum level indicated on the bottle to avoid potential overflow as the contents of the waste bottle are potentially infectious. ▲

Warning The contents of the waste bottle are potentially infectious, so it is important to wear protective clothing, such as disposable gloves, a laboratory coat and safety glasses, when emptying or handling a waste bottle. ▲

Foaming   The liquid level sensor is unable to detect foam. In case of foaming:

1. When using wash buffers that show a strong tendency of foaming, empty the waste container as soon as the foam level has reached the maximum filling level indicated on the waste container.

2. Additionally, add a commercially available anti-foaming agent, such as silicone oil, to the empty waste container to reduce foaming. Use concentrations of anti-foaming agents as recommended by the manufacturers.

3. If foaming continues to be a problem, we recommend switching to a larger waste container and additionally increasing the concentration of anti-foaming agent in the waste container.

4. To help facilitate breakdown of the foam in the waste container, carefully swirl the waste container from time to time to improve mixing between foam layer and anti-foaming agent.

Installing the aerosol cover

During operation, the see-through aerosol cover can be present (Figure 2–2) or absent. The aerosol cover primarily protects the user against biohazardous aerosols and also against environmental contamination. The aerosol cover reduces the amount of airborne pathogens making the air you breathe healthier and cleaner.
Figure 3–20 shows the aerosol cover being installed. The corners have magnets for quick magnetic mounting of the cover.
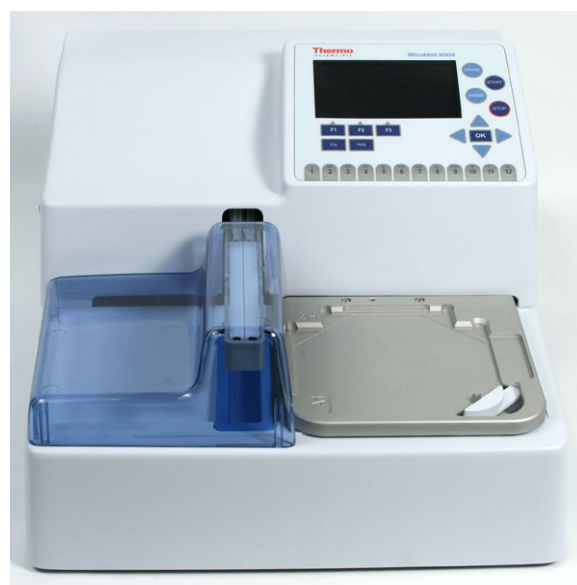
Figure 3–20. Magnetic mounting of the aerosol cover

Connecting the power supply cable

To connect the power supply cable:

Warning Never operate your instrument from a power outlet that has no ground connection. Never use a power supply cable other than the Thermo Scientific power supply cable designed for your region. ▲

1. Ensure that the ON/OFF switch (Figure 3–21) at the right side panel of the instrument is in the OFF (**0**) position.

2. Connect the power supply to a correctly installed line power outlet that has a protective grounded conductor.

3. Connect the power supply cable to the power input socket (Figure 3–21) at the back of the instrument.

USB port for memory stick

ON/OFF switch

Power supply connector

Serial RS-232 C port

USB port for PC

Figure 3–21. Connecting the power supply cable

Connecting to a computer

If you are using an external computer with the Wellwash Versa in remote control, connect the communication cable to the USB port for PC or serial RS-232 C port (Figure 3–21).

Warnings and cautions

This instrument is designed to provide full user protection. When correctly installed, operated and maintained, it will present no hazard to the user.

The following recommendations are given for added user safety.

Electrical

Ensure that the power supply cable supplied with the unit is always used. If a correct type of mains cable is not provided, use only cables certified by the local authorities.

The power plug should only be inserted into a socket outlet with a protective ground contact. Never use an extension cable without a protective ground wire.

Warning Only authorized technical service personnel are allowed to open the instrument. Disconnect the instrument from all voltage sources by disconnecting the power supply cable before opening the instrument. ▲

The same precautions applicable when using any electrical equipment should naturally be observed with this instrument.

Warning Do not touch switches or electrical outlets with wet hands. Switch the instrument OFF before disconnecting it from the mains supply. ▲

Defects and abnormal stresses

This section describes defects and abnormal stresses.

Warning If the instrument is not functioning properly, it may create electromagnetic interference, which could impair the operation of other devices or equipment in the usual environment. ▲

Whenever it is likely that the protection has been impaired, the instrument should be made inoperative and be secured against any unintended operation. Contact authorized technical service immediately.

The protection is likely to be impaired if, for example, the instrument:

● Shows any visible damage

● Fails to perform the intended functions

● Has been subjected to prolonged storage under unfavorable conditions

● Has been subjected to severe transport stresses.

Operating precautions and limitations before operation

1. Read this manual in its entirety, as it contains information necessary to ensure safe operation.

2. Always ensure that the electrical supply in the laboratory conforms to that specified on the type label on the rear of the instrument.

3. Particular attention should be paid to the correct fitting of the tubing – follow the color code carefully.

4. Fill the reagent and rinse containers only after the installation and operational check of the system.

5. Check that the correct protocol has been selected for the washer.

6. Check that the liquids are put in the correct containers called for by the protocol.

7. Check that there is sufficient liquid in the liquid containers and room in the waste container to run the protocol or series of protocols. Empty the waste container before a run or a series of runs. The liquid level sensor will warn you if safe levels have been passed. Some warnings can be overridden – at the user's risk.

8. Check that the wash head configuration matches the configuration demanded by the protocol. For example, if 2 x 12-way heads have been fitted and the protocol demands a 1 x 8-way head, this may result in the plate carrier getting wet.

9. Fit the microplate in the correct orientation appropriate for the wash head configuration. Note that if you do not load a microplate correctly onto the instrument (for example, a 12-way wash head has been fitted when a plate is loaded for an 8-way head), this will result in the plate carrier getting wet.

10. Select the number of strips to be processed correctly. If there are empty strips on a plate, ensure that they are not selected to be processed.

Switching on

Check that all the cables are properly fitted according to the installation instructions. Switch the instrument ON. The system performs initialization tests (= self diagnostics) each time when switched on.

Caution Do not switch the power off during "Performing self diagnostics". Do not plug/unplug the USB memory stick during "Performing self diagnostics". ▲

Caution Prime the liquid system with the liquid that will be used (wash buffer). Ensure that the dispensing pump is not run for longer than a few minutes without liquid, otherwise it may be damaged. ▲

Caution Do not touch the wash head or plate carrier when the instrument is busy. ▲

Performing the operational check

Before switching the instrument on:

- Move the wash arm up and down, and the plate carrier back and forth to ensure that they move freely.

- Lower the wash arm, with the wash head in place, so that the tips touch the plate carrier. Then move the plate carrier until the tips are aligned with the small circular indentations on the surface of the plate carrier. Check that the outermost tips in the wash head are directly above the indentations to ensure that the wash arm is right-angled to the plate carrier.

After switching the instrument on and before you put the instrument into use, perform the following operational check.

- Rotate empty bottles upside down one by one to ensure that the liquid level sensors in the bottles work properly. The liquid level icon should indicate full when the bottle is upside down and empty when the bottle is in an upright position.

- Prime the instrument to ensure that priming works and all the channels are filled with liquid. For more information, refer to "Priming the system" on page 40.

- Run a protocol, for example, one of the demo protocols available with the instrument. The protocol should have an aspirate, dispense, shake and soak function to ensure an adequte sample of functions to test the instrument's proper operation. Check that the liquid channels work properly during dispensing and aspiration.

- To ensure that each channel works properly, change the channel that is used in the dispense step and run the protocol again.

Settings after installation

If you want to change, for example, the wash head(s) or the language, modify the required settings in the **Settings** menu. Refer to "Settings menu" on page 68.

Chapter 4
Running Wash Protocols

To run a wash protocol:

1. Ensure that there is sufficient liquid in the used buffer containers A, B or Rinse and that the Waste container is not full when you begin.

    The liquid levels in the containers are automatically monitored during runs. Follow the color-coded bottle icons on the info text bar. Refer to "Filling and emptying liquid containers" on page 38.

2. Select a protocol. Refer to "Selecting a protocol" on page 38. The selected protocol name is shown on the **Protocol** row in the **Main** menu.

3. Insert the 96- or 384-well plate to be washed onto the plate carrier and ensure that the microplate is correctly oriented according to the wash head configuration.

    The A1 position of the plate is in the upper left corner when the *n x 8* or *1 x 16* wash head is in use, and in the lower left corner when the n x 12 wash head is in use. Refer to "Loading the plate" on page 39.

    Ensure that the plate is not covered.

4. Press the **PRIME** key to prime the instrument. Refer to "Priming the system" on page 40.

5. Select the strips if they are not already selected. Refer to "Strip selection" on page 41.

6. Press the **START** key.

7. The microplate is washed automatically according to the predefined protocol.

8. If you want to abort the run, press the **STOP** key during the run.

9. Remove the plate after the wash protocol.

10. Rinse the instrument. Refer to "Rinsing the liquid system" on page 43.

Filling and emptying liquid containers

To fill or empty the liquid containers:

1. Remove the liquid containers and fill or empty them when necessary. Refer to "Liquid level detection" on page 48.

2. Unscrew the liquid container cap and fill with a suitable buffer solution.

3. Replace the liquid container cap and reinstall the liquid or waste container. Refer to "Liquid containers" on page 27.

4. Always reprime the system before running a wash protocol. Refer to "Priming the system" on page 40.

Selecting a protocol

You can select a protocol from the protocol list or first create a protocol and then start it. Refer to "Selecting a ready-made protocol" on page 38 and "Creating a protocol" on page 49.

Selecting a ready-made protocol

You can select a ready-made protocol either with the **F1-F3** keys or from the protocol list in the display (see "Protocol" on page 48).

Three ready-made, demo or favorite protocols can be connected to the **F1-F3** keys to select routine assays quickly. To assign your own protocols to the keys, press the **FILE** key in the protocol list and select Quick Key > **Set/Clear F1–F3**.

To start a ready-made protocol shown on the info text bar with the quick keys (**F1-F3**) or from the protocol list:

F1-F3 function keys
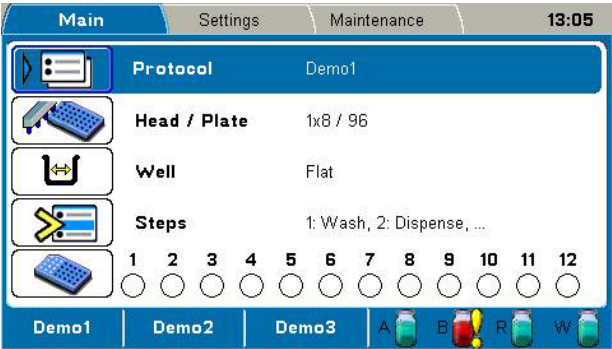
Example protocol list

1. Press, for example, the **F1** key (*Demo1*) in the **Main** menu

    OR

    Press the **OK** key on the **Protocol** row in the **Main** menu

    OR

    Press the **FILE** key in the **Main** menu and select *Open* using the **Down** arrow key, and then press the **OK** key.

2. Select the ready-made protocol you want to run from the protocol list using the **Down** arrow key, and then press the **OK** key.

Loading the plate

Selecting the wash head defines the plate type and orientation:

Table 4–2. Wash head vs. plate and orientation

Wash head	Plate	Orientation
n x 8	96-well plate	Landscape
n x 12	96-well plate	Portrait
1 x 16	384-well plate	Landscape

Insert the 96- or 384-well plate to be washed onto the plate carrier (Figure 4–22). Ensure that the microplate is correctly oriented to match

the wash heads (Table 4–2). Position A1 of the plate should correspond to position A1 marked on the plate carrier. Do not push the plate clamp inward.

The plate or microstrips must be properly and steadily lowered onto the surface of the plate carrier to prevent jamming of the head movement. The plate clamp will apply pressure to the plate to stop free movement during processing.

Figure 4–22. Inserting the microplate

Caution Make sure that the microplate position A1 is inserted correctly before starting wash protocols. ▲

Caution Make sure that the strips in strip plates are positioned in the microplate as selected in the user interface, otherwise spilling can occur and the instrument may become contaminated. ▲

Caution For proper performance, all wells in a strip should have an equal amount of liquid. ▲

Priming the system

The **PRIME** key starts a sequence and a list of buffer channels appears. The default channel is the liquid specified by the first step of the wash protocol. After selecting the channel, set the priming volume by modifying the default volume of 30 µl.

Priming ensures that the lines to the wash head are filled with liquid. If you prime for the first time, the lines are empty and you should use a greater volume to fill the lines completely. At least 30 ml of liquid is needed to fill the lines from the bottle to the tip. On subsequent priming occasions when the lines have liquid, you can use a smaller priming volume.

Note In case of two-buffer protocols, both the buffer channels have to be primed before the protocol is started. If channels are switched within

the same protocol, add a prime step to the protocol to ensure that liquid in the tubing is replaced completely (volume of at least 15 ml is required). ▲

The volume used during priming is defined in the Settings > Prime & rinse parameters > **Prime volume (Prime button) (ml)** menu. Refer to "Prime & rinse parameters" on page 68.

Strip selection

The layout editing of the plate or strips can be carried out in two ways: either by using the number keys or the **Layout** row in the **Main** menu.

Strip selection with the number keys

It is possible to select the strips to be processed on the plate with the number keys.
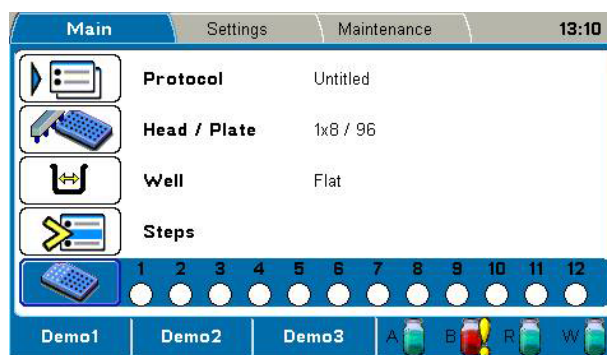
The following rules apply when the number keys are used:

- 1 x 8 wash head: strips 1 to 12, any combination

- 1 x 12 wash head: strips A to H, any combination (press number keys 1–8, respectively)

- 1 x 16 wash head: strips 1 to 24, any combination (press number keys 1–12 to select two strips at a time, respectively)

- 2 x 8 wash head: any combination of two adjacent strips. Only an even number of strips can be selected.

- 2 x 12 wash head: any combination of two adjacent strips. Only an even number of strips can be selected.

- Press the corresponding number key to select a strip.

- Press the corresponding number key to unselect the strip.

- Double-press a key to select all unselected strips from this key down to a selected strip if that exists. An even number of strips are selected with 2 x wash heads.

- Double-press a key corresponding to a selected strip to delete all selected strips in descending order. An even number of strips are deleted with 2 x wash heads. All selections are deletable.

● Hold the **C / 12** key down for more than 2 seconds to clear all selections.

● Double-press the **C / 12** key to select all when the area is empty.

● Strip selection works when any row in the **Main** menu is active.

Strip selection with the Layout row

The layout of the plate or strips in the protocol can alternatively be edited in the **Layout** window.

OK

Go to the **Layout** row in the **Main** menu and press the **OK** key.

OK ◀ ▶
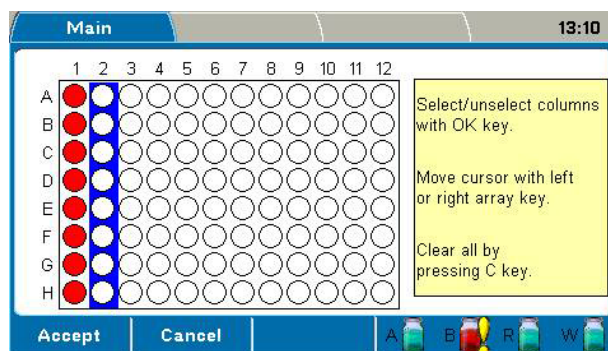
Select strips by pressing the **OK** key and by moving with the left or right arrow key.

Strips 1-12 are edited if an 8-way wash head is used or strips A-H if a 12-way wash head is used.

The selected strips are highlighted with red color
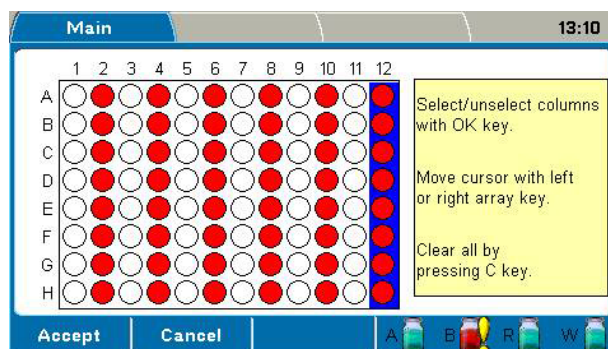
Canceling a run

You can cancel a started run by pressing the **STOP** key except when the Wellwash Versa is already waiting for a user input (key) to some warning or error message being displayed as a consequence of some error detected in the run.

Rinsing the liquid system

The **RINSE** key starts a sequence where the rinse liquid is pumped through the liquid system for a short period of time and left in the lines.

The volume used during rinsing is defined in the Settings > Prime & rinse parameters > **Rinse volume (Rinse button) (ml)** menu. Refer to "Prime & rinse parameters" on page 68.

Chapter 5
Operating the Instrument

This section describes the user interface of the Wellwash Versa instrument.

Display and keys for navigating and editing

The keypad and display are shown in Figure 5–23.
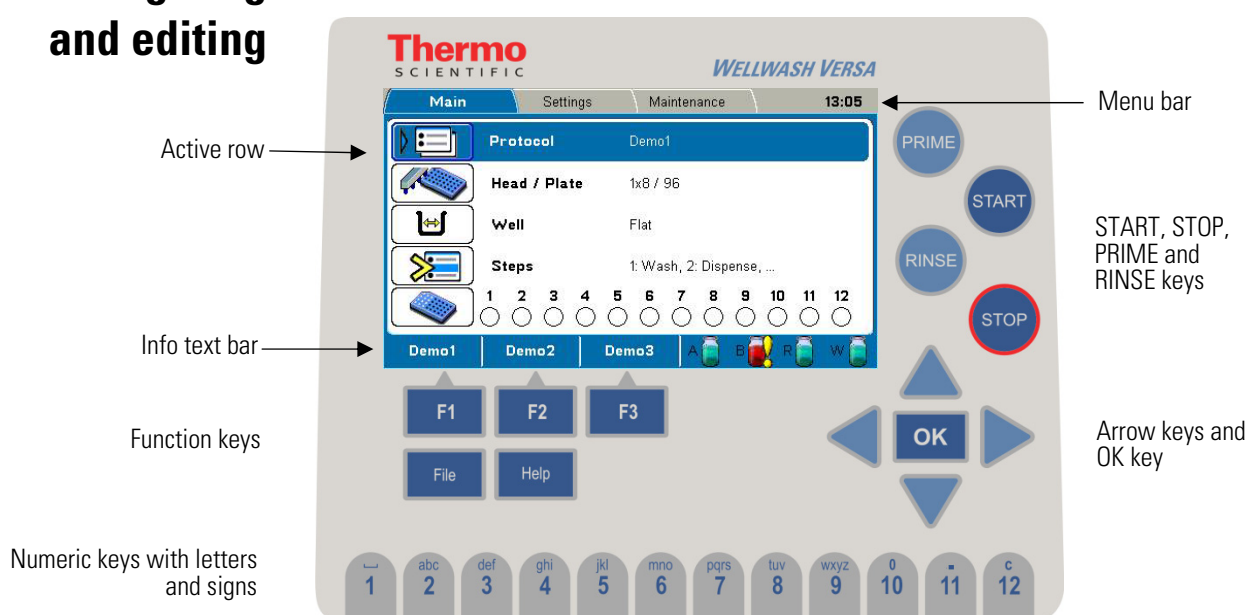
Figure 5–23. Keypad and display of the Wellwash Versa

The keys for navigating and editing are detailed below. The keys also have other functions depending on the menu level in the user interface.

The active row is colored blue.

Use the **Left**, **Right**, **Up** and **Down** arrow keys to navigate. You can repeat the selection by holding down the arrow key.

Use the **OK** key to select and edit the highlighted item. It is mostly used for setting and accepting the active parameter.

| F1 | F2 | F3 |

Use the **F1-F3** keys to select a corresponding action shown on the info text bar (Figure 5-23). The function assigned to a key depends on the active menu. For example, the keys can be used to accept or cancel changes, close a window, add or delete protocol steps, sort lists, and lock protocols.

In the **Main** menu, the **F1-F3** function keys are reserved for protocols that you can assign to the keys for a quick selection. The instrument is shipped with three demo protocols assigned to the keys. To assign your own protocols to the keys, press the **FILE** key in the protocol list and select Quick Key > **Set/Clear F1–F3**.

File

Press the **FILE** key, for example, to save the active protocol in the **Main** menu. Depending on the active menu, the **FILE** key opens a list of actions possible for the current protocol: *New*, *Open, Save, Save As*, *Quick Key*, *Export*, *Import* and *Delete*.
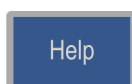
Help

Press the **HELP** key to view more detailed instructions about the context.

PRIME

Press the **PRIME** key to prime the instrument.

RINSE

Press the **RINSE** key to rinse the instrument.

START

Press the **START** key to start the execution of the currently selected protocol.

STOP

Press the **STOP** key to terminate the active protocol execution.

Pressing the key also returns the internal software to the previous state.

In addition, this key can be used to terminate the possible computer remote control.

Use the alphanumeric keys to enter numbers and text.

- The space character is found under the **1** key.

- The following special characters are found under the **. / 11** key:
  . – ' + ! % : ( )

- The **µ** character is found under the **mno / 6** key.

Use the **CLEAR** (**C / 12**) key to delete numbers or text.

Use the keys to select strips. Refer to "Strip selection with the number keys" on page 41.

To write a capital letter, press the desired letter key repeatedly until the capital appears.

Menus

The internal software includes the **Main**, **Settings** and **Maintenance** menus.

The menu layout is displayed in Table 5–3.

Table 5–3. Program overview

Main	Settings	Maintenance
∟ Protocol	∟ Prime & rinse parameters	∟ Clean
∟ Head / Plate	∟ Sensors	∟ Calibration
∟ Well	∟ Wash head configuration	∟ Service
∟ Steps	∟ System	
∟ Layout	∟ Reports	

Main menu

You can specify the protocol-related parameters and manage the run of the active protocol in the **Main** menu. The **Main** menu is the one that opens when you start the instrument.

The **Main** menu contains the **Protocol**, **Head / Plate**, **Well**, **Steps** and **Layout** rows, and their parameters.
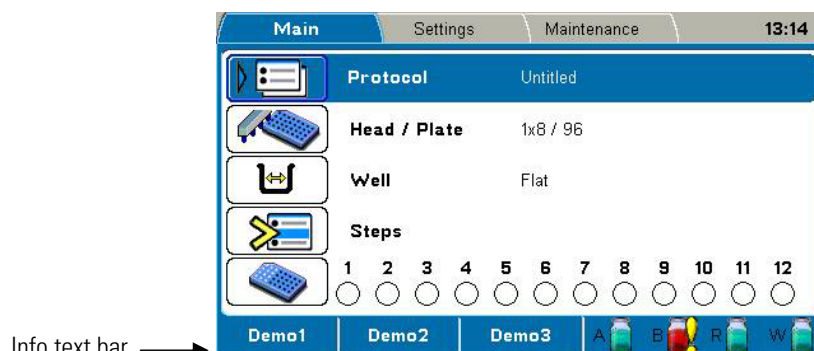
Info text bar →

The clock on the menu bar shows real time.

See the info text bar for the required actions of the **F1-F3** keys. The action text on the info text bar changes according to the current menu.

Liquid level detection

The info text bar also shows the liquid level in the containers (**A**, **B**, **R** and **W**). The liquid containers have sensors to enable constant and automatic liquid level detection during runs. Fill the buffer containers and empty the waste container if the red bottle icon appears on the info text bar. Refer also to "Sensors" on page 70.
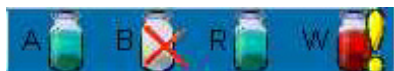
Liquid level detection (LLD):

Liquids A, B and Rinse

- bottle icon is *green* when the container is full

- bottle icon is *red* with an exclamation mark when the container is near empty

- bottle icon is *empty* with a cross when the LLD is disabled

Waste

- bottle icon is *red* with an exclamation mark when the container is full

- bottle icon is *green* when the container is not yet full

- bottle icon is *empty* with a cross when the LLD is disabled

Protocol

The **Protocol** row in the **Main** menu shows the name of the active protocol. An asterisk in front of the protocol name indicates unsaved changes to protocol parameters.

You can open another protocol by pressing the **OK** key on the **Protocol** row or by pressing the **FILE** key. The list of saved protocols opens. The protocols are listed in alphabetical order by protocol name. The maximum number of available wash protocols is 99.

🔒 It is possible to protect protocols from accidental editing or deleting. A locked symbol is shown in front of the protocol name when locked.

To lock a protocol, select it on the protocol list and press the **F3** (Lock) key.

For more details on opening a protocol, refer to "Selecting a protocol" on page 38.

For instructions on how to start, create and save protocols, refer to Chapter 4: "Running Wash Protocols" and "Creating a protocol" on page 49.

△ **Caution** If the wash head format of the protocol that you want to open is different from the wash head format that is currently installed in the instrument, all the protocol parameters are reset to their default values. ▲

△ **Caution** Change the wash head format to match the one used in the protocol before opening such a protocol to avoid resetting the protocol parameters. ▲

Creating a protocol   To create a protocol:
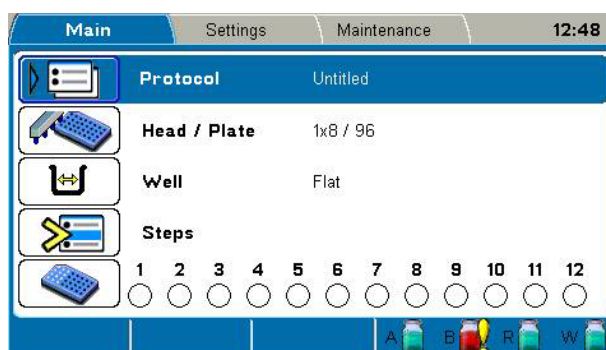
File   1. Press the **FILE** key in the **Main** menu to create a new protocol. Refer to "Protocol" on page 48.

OK

2. Select *New* and press the **OK** key.

OK

3. Select the **Head / Plate** row using the **Down** arrow key and press the **OK** key. The wash head/plate list box appears. Refer to "Head / Plate" on page 57.

OK
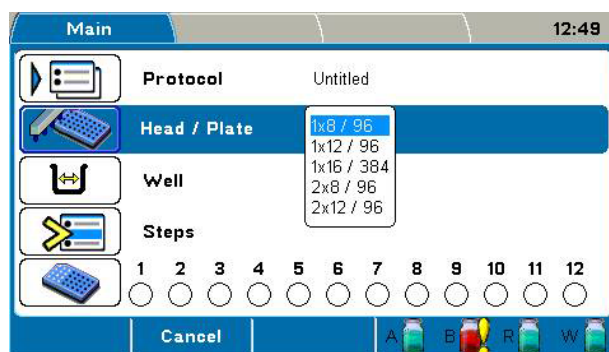
4. Select the wash head and plate with the **Down** arrow key and/or press the **OK** key to accept the selection.

   If the selected wash head is different from the one that is set in the **Settings** menu, you must change the wash head in the **Settings** menu. Refer to "Wash head configuration" on page 70.

OK
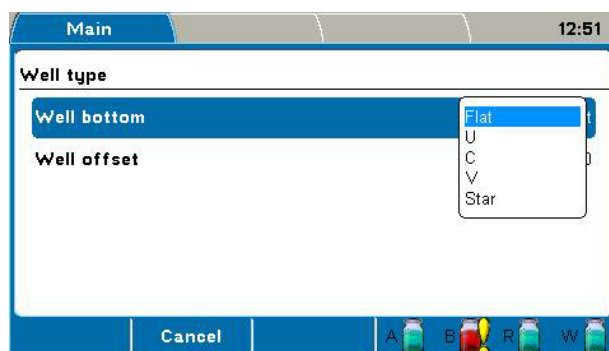
5. Select the **Well** row and press the **OK** key. The **Well type** window opens. Refer to "Well" on page 58.

OK

6. Select the well bottom shape of the plate or strips with the **Down** arrow key and/or press the **OK** key to accept the selection.

7. Adjust the well offset value with the **Down** or **Up** arrow key. Press the **OK** key to accept the selection. For more information on the Preview function, refer to "Well" on page 58.

8. Select the **Steps** row in the **Main** menu using the **Down** arrow key and press the **OK** key. Refer to "Steps" on page 60.
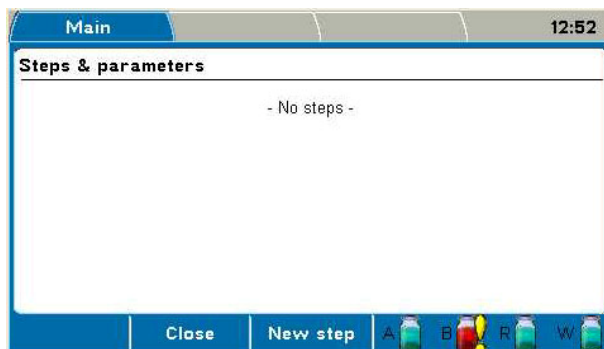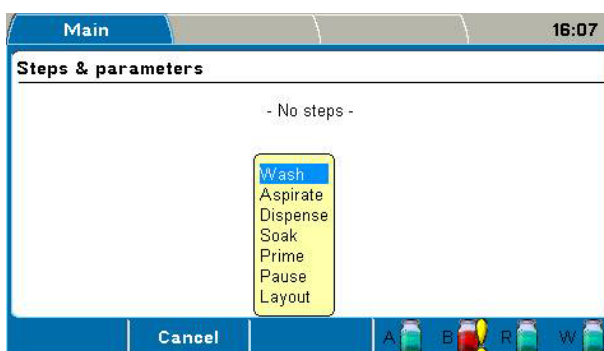
Main			12:52

Steps & parameters

- No steps -

Close | New step

9. Press the **F3** (New step) key to open the step list box.

Main			16:07

Steps & parameters

- No steps -

Wash
Aspirate
Dispense
Soak
Prime
Pause
Layout

Cancel

10. Select the step with the **Down** arrow key and/or press the **OK** key.

Main			12:27

Steps & parameters

1: Wash   A / 300µl / 3 cyc / 00:00

Delete | Close | New step
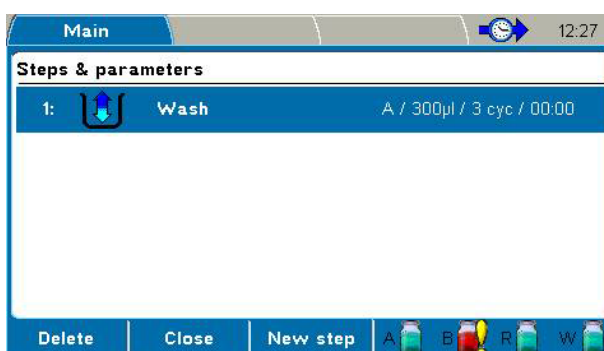
Steps are listed and numbered in the order of execution. It is possible to create several steps in the step list and process the steps in the defined

sequence. Steps can be used several times in the user-defined order. In a majority of applications the protocol has only a wash step.

Main	Settings	Maintenance	11:37
Protocol		Untitled	
Head / Plate		1x8 / 96	
Well		Flat	
Steps		Wash: A / 300µl / 3 cyc / 00:00	
1 2 3 4 5 6 7 8 9 10 11 12			

For more information on the step parameters, refer to "Steps" on page 60.

11. Select the strips to be processed by using the number keys. Refer to "Strip selection with the number keys" on page 41.
OR
Use the **Down** arrow key to select the **Layout** row in the **Main** menu and press the **OK** key. Refer to "Strip selection with the Layout row" on page 42).

12. Once the processed area is selected, save the new protocol. Press the **FILE** key in the **Main** menu. Note that the processed area is not saved with the protocol. Use the layout step if you want to save the processed area.

13. Select *Save As* using the **Down** arrow key and press the **OK** key. The *Save Protocol As* dialog opens.

14. Enter the protocol name, for example, *Test1*, by using the number and letter keys, and then press the **OK** key. The protocol is now created.

Note You cannot use the protocol name "*Untitled*".

Main	Settings	Maintenance	12:56
Protocol		Untitled	
	Save Protocol As		
	Protocol: Test1		
	OK:Save F2:Cancel		11 12
Cancel			A B R W
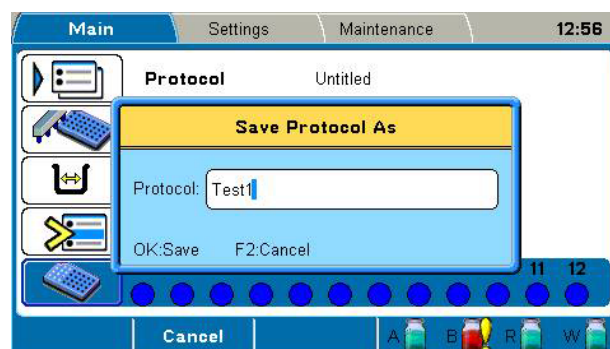
Creating a protocol in an optional way

An optional way to create a protocol is to use the **Protocol** window:

1. Select the **Protocol** row in the **Main** menu using the **Up** or **Down** arrow key and press the **OK** key.

2. Select the **Create a new protocol** row and press the **OK** key.

3. Enter a name for the protocol and press the **OK** key.
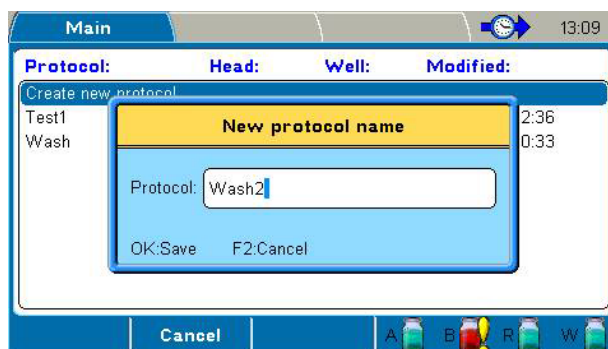
4. In the **Main** menu, set the desired protocol parameters and steps.

5. When ready, press the **File** key and select *Save* to save your protocol.

Adding new steps to protocols

To add a new step to a protocol:

1. Select the **Steps** row in the **Main** menu using the **Down** arrow key and press the **OK** key.
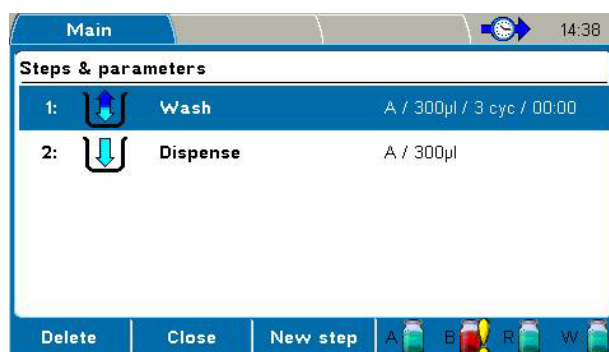
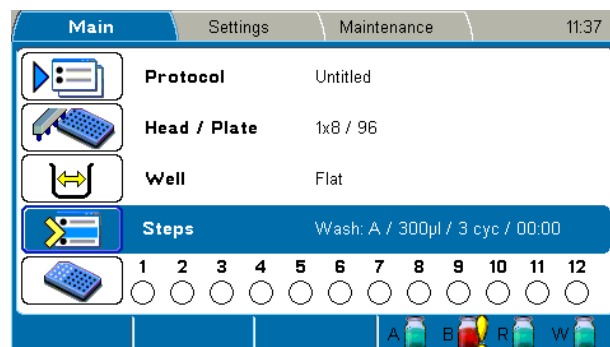2. Press the **F3** (New step) key to open the step list box.

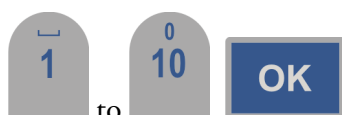3. Select the step with the **Down** arrow key and/or press the **OK** key.

4. A flashing insert bar with the selected step appears. Select the position where you want to insert the step by using the **Up** or **Down** arrow key. Press the **F3** (Insert) key.

OK
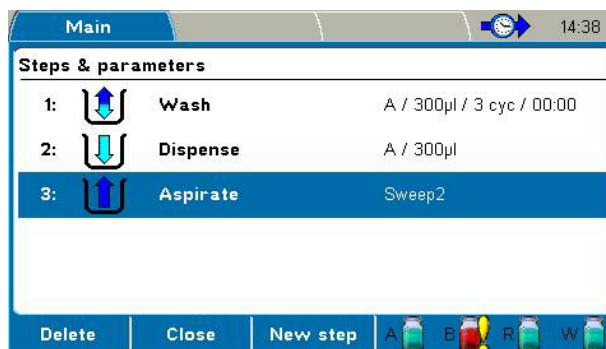
5. Press the **OK** key to edit the aspirate step. For more details on the *Aspirate* step, refer to "Aspirate" on page 63.
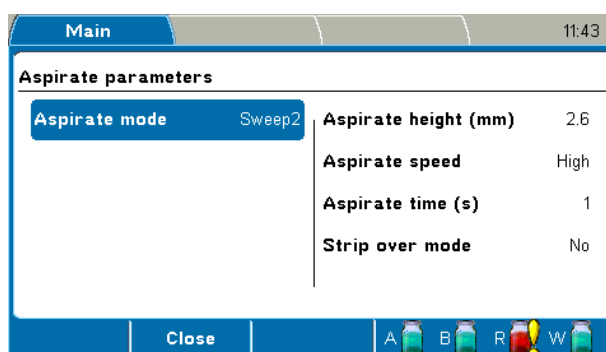
6. Save the changes you make in each step.

F3

7. Press the **F3** (New step) key to add further new steps to the protocol.

OK

8. Select a new step with the **Down** arrow key and press the **OK** key to add the step to the protocol.

You can continue in the same manner as above, adding the desired steps to your protocol.

When there are more steps present than the display can show, **blue** arrows appear at the bottom and/or at the top of the display.

9. Use the **Up** and **Down** arrow keys to navigate in the protocol.

Deleting steps from protocols

To delete a step from a protocol:

1. Use the **Up** and **Down** arrow keys to go to the step you want to delete and press the **F1** (Delete) key.

2. Press the **OK** key to confirm the deletion.

Head / Plate   You can select the wash head and plate format on the **Head / Plate** row in the **Main** menu.

If you change the wash head and plate, check the step parameters afterwards.
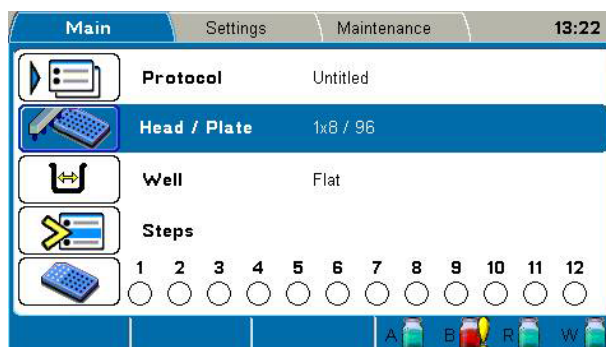
OK   When you press the **OK** key, the wash head/plate list box appears.
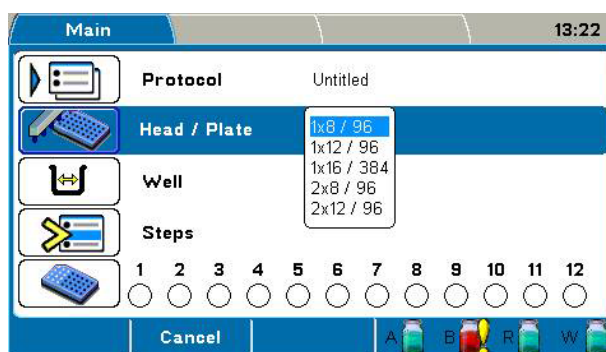
The default wash head setting is *2 x 8* for Wellwash Versa. When a one-column wash head (1 x 8 or 1 x 12) is used, the blank wash head should always be on the left of the wash arm (viewed from the front).

OK   Press the **OK** key to accept the selected wash head and plate.

Well   You can select the well shape and well offset on the **Well** row in the **Main** menu.

If you change the well shape, check the step parameters afterwards.

OK   When you press the **OK** key, the **Well type** window appears.
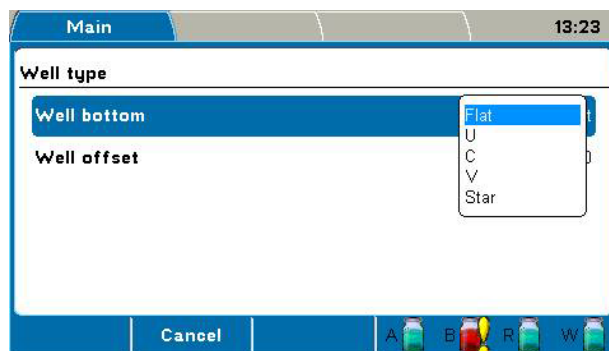
The following settings are available:

● **Well bottom** – Select the well shape.

Different well shapes of strips and plates available are shown in Figure 5–24. V is typically V shaped and differs distinctly from U and C wells. The default well shape format is *Flat*.

Note If a 384-well plate is selected, you can select only the *Flat* well shape. ▲

Note The well shape has an effect on the aspiration height and aspiration mode. ▲

| Flat | C | U | V | Star A | Star B |
| Flat bottom | Flat bottom with curved edges | Round bottom | V bottom | Flat bottom with curved edges and 8 ribs | Showing the orientation of the 8 ribs |

Figure 5–24. Well shapes

● **Well offset** – Adjust the X offset of a plate. Adjustment is required primarily with a 384-well plate. The offset value ranges from -1.5 mm to 1.5 mm in increments of 0.1 mm.

Caution With 384-well plates, check that the offset limit is not too big to prevent dispensing outside the wells. ▲

Use the up and down arrow keys to adjust the value.

Press the **F3** (Preview) key to move the plate carrier and align the wash head over the first column of a plate. Then press the left or right arrow key to move the plate carrier in steps of 0.1 mm.

Caution Well offset has an effect on the residual volume in the well. ▲

Press **OK** to accept the value and/or **F2** to close the window.

Microplate requirements
Both 96- and 384-well format microplates can be used with the Wellwash Versa (Table 5–4).

Note Use only plates manufactured according to ANSI/SBS standard dimensions. ▲

Table 5–4. Microplate requirements

Well plate	Default plate code	Default plate designation	Bottom shape	Bottom height	Dimension name	Plate dimensions
96 wells	439454	Nunc solid F96	Flat	3.1 mm	Max. overall plate height	14.5 mm ± 0.2 mm
	449824	Nunc U96	U	4.2 mm		14.5 mm ± 0.1 mm
	430341	Nunc C96	C	3.4 mm		14.0 mm ± 0.3 mm
	249662	Nunc V96	V	4.1 mm		14.5 mm ± 0.1 mm
	441653	Nunc starwell strip plate	Star	3.6 mm		
					Footprint	9.0 mm
					Pitch size (center to center)	9.0 mm
384 wells	464718	Nunc F384	Flat	2.7 mm	Max. overall plate height	14.4 mm ± 0.25 mm
					Footprint	4.5 mm
					Pitch size (center to center)	4.5 mm

Steps

You can create or edit the wash protocol in the **Main** menu.

Steps are listed and numbered in the order of execution. It is possible to create several steps in the step list and process the steps in the defined sequence. Steps can be used several times in the user-defined order. In the majority of applications the protocol has only a wash step. A protocol can have a maximum of 99 steps.

If there is more than one step in the protocol, the step parameters are not shown on the **Steps** row due to lack of space.

Refer to "Adding new steps to protocols" on page 54 and "Deleting steps from protocols" on page 56.

The following steps are available:

- Wash
- Aspirate
- Dispense
- Soak
- Prime
- Pause
- Layout

Wash

Liquid is aspirated and liquid is dispensed into the well. Simultaneous dispensing and aspiration is possible with greater volume or lower dispensing height for increased washing efficiency. Wells can be left empty or full at the end of the wash step. The wash step is the most commonly used step in wash protocols. It is often the only step in wash protocols and, therefore, has more parameters than the other steps.
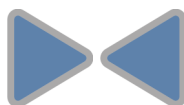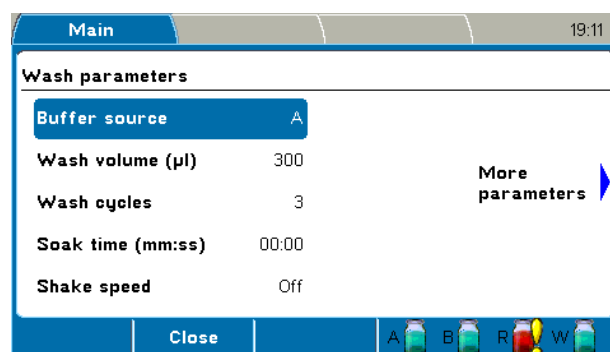
The wash parameters are grouped into two windows. Use the **Right** and **Left** arrow keys to move from one window to another.
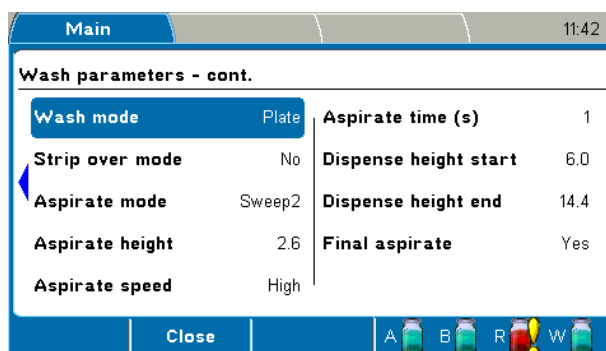
The *Wash* step has the following parameters:

- **Buffer source** – You can define the reagent source channel A, B or Rinse. The default is *A*.

- **Wash volume (µl)** – Volume of the wash buffer used in microplate washing. For a 96-well plate, the wash volume range is 50 µl to 1000 µl in 10 µl increments and the default value is *300 µl*.

  For a 384-well plate, the wash volume range is 20 µl to 300 µl in 10 µl increments and the default value is *100 µl*.

  It is possible to dispense more than the well volume and the excess liquid is aspirated. If a so-called overflow volume is selected where the dispensing volume is greater than the well volume, the dispensing height is affected. That is, it is not possible to lift the wash head too high without aspirating the excess liquid.

- **Wash cycles** – You can define the number of wash cycles that will be performed, from 1 to 10. The default value is *3*.

- **Soak time (mm:ss)** – The soak time is the time period between wash cycles in the wash step. The default value is *00:00* (= no soak). The minimum value is 1 s and the maximum value 60 min in increments of 1 s.

- **Shake speed** – You can define the shake speed Off, Low, Medium, or High. The default is *Off*. The shake speed setting is effective only when the soak time is > 00:00.

⚠ **Caution** Ensure that the liquid does not spill at the shake speed and volume settings that you use. ▲

- **Wash mode** – You can define the wash mode. The default is *Plate mode*.

  - **Plate** – All selected strips are processed before the next cycle.

  - **Strip** – Each selected strip is processed the number of cycles defined before moving to the next strip.

- **Strip over mode** – You can define the strip over function. The default is *No*.

  - **No** – All selected strips are processed as fast as possible.

- **Yes** – Unused strips are processed dry. The time parameters are measured during the first protocol run. The wash head stays above unused strips for as long as it takes to process each selected strip.

- **Aspirate mode** – You can define the aspiration mode Normal, Sweep 2 or Sweep 3. Sweep is allowed for 96-well plates with flat or C-shaped wells. The default value depends on the wash head type or well shape.

  - **Normal** – There is one aspiration position in the center of the well.

  - **Sweep2** – Aspirates in two different positions across the bottom of the well.

  - **Sweep3** – Aspirates in three different positions across the bottom of the well.

- **Aspirate height** – The aspirate height ranges from 0 mm to 14 mm in 0.1 mm increments. The default aspirate height varies according to the plate type and well shape (Table 5–5). The zero height from which the aspirate height is defined is the lowest level of a plate when the plate is properly placed on the plate carrier.

Table 5–5. Plate and well shape vs. default aspirate height

Plate / Well shape	Default aspirate height	
96 / Flat	2.6 mm	
96 / C	2.9 mm	Default aspirate heights are defined so that the wash heads float above the bottom. For example, 0.5 mm above the bottom with flat bottom plates.
96 / U	4.2 mm	
96 / V	5.4 mm	
96 / Star	3.1 mm	
384 / Flat	2.2 mm	

- **Aspirate speed** – You can define the aspiration rate Low, Medium or High. The default is *High*.

- **Aspirate time (s)** – The aspiration time ranges from 0 s to 10 s in 1 s increments. The default is *1 s*.

Note Because aspiration is on during dispensing, the residual volume in the wells depends on the dispensing height. ▲

- **Dispense height start** – The dispense height start ranges from 0 mm to 17 mm in 0.1 mm increments. The default is *6.0 mm*. Ensure that the value fits the plate in use. Because dispensing starts from a lower level in a well and ends at a higher level, the start height should be lower than or equal to the end height.

- **Dispense height end** – The dispense height end ranges from 0 mm to 17 mm in 0.1 mm increments. The default is *14.4 mm*.

- **Final aspirate** – The wells are emptied in the end of the step. The default is *Yes* which leaves wells empty. *No* leaves the wells wet.

Aspirate

An aspirate step removes liquid from the wells. The aspirate step can be used in a protocol together with other steps.

Main			11:43
Aspirate parameters			
Aspirate mode	Sweep2	Aspirate height (mm)	2.6
		Aspirate speed	High
		Aspirate time (s)	1
		Strip over mode	No
	Close	A B R W	
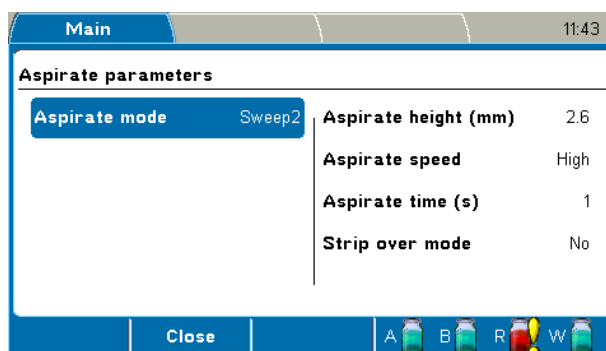
The *Aspirate* step has the following parameters:

- **Aspirate mode** – You can define the aspiration mode Normal, Sweep 2 or Sweep 3. The default is *Normal*. Sweep is allowed for 96-well plates with flat or C-shaped wells.

    - **Normal** – There is one aspiration position in the center of the well.

    - **Sweep2** – Aspirates in two different positions across the bottom of the well.

    - **Sweep3** – Aspirates in three different positions across the bottom of the well.

- **Aspirate height (mm)** – The aspiration height ranges from 0 mm to 14 mm in 0.1 mm increments. The aspiration height varies according to the plate type and well shape (see Table 5–5 on page 62). The default is *2.6 mm*.

Note The aspiration height defines the amount of residual volume in the wells. If you want the wells completely empty, move the tips all the way to the well bottom. ▲

- **Aspirate speed** – You can define the aspiration rate as Low, Medium or High. The default is *High* in 96-well format and *Low* with 384-well format.

- **Aspirate time (s)** – The aspiration time ranges from 0 s to 10 s in 1 s increments. The default is *1 s*.

- **Strip over mode** – You can define the strip over function. The default is *No*.

    - **No** – All selected strips are processed as fast as possible.

    - **Yes** – If Yes is selected, unused strips are processed dry. The time parameters are measured during the first protocol run.

The wash head stays above unused strips for as long as it takes to process each selected strip.

Dispense

A dispense step fills the wells with liquid. The dispense step can be used in a protocol together with other steps.
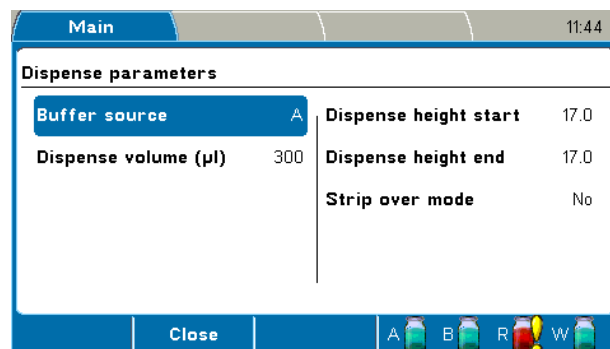
The *Dispense* step has the following parameters:

- **Buffer source** – You can define the reagent source channel A, B, or Rinse. The default is *A*.

- **Dispense volume (µl)** – For a 96-well plate, the dispense volume range is 50 µl to 400 µl in 10 µl increments and the default value *300 µl*.

  For a 384-well plate, the wash volume range is 20 µl to 120 µl in 10 µl increments and the default value *100 µl*.

Note Because aspiration is on during dispensing, the residual volume in the wells depends on the dispensing height. ▲

- **Dispense height start** – The dispense height start ranges from 0 mm to 20 mm in 0.1 mm increments. The default is *17.0 mm*. Ensure that the value fits the plate in use. Because dispensing starts from a lower level in a well and ends at a higher level, the start height should be lower than or equal to the end height.

- **Dispense height end** – The dispense height end ranges from 0 mm to 20 mm in 0.1 mm increments. The default is *17.0 mm*.

- **Strip over mode** – You can define the strip over function. The default is *No*.

  - **No** – All selected strips are processed as fast as possible.

  - **Yes** – If Yes is selected, unused strips are processed dry. The time parameters are measured during the first protocol run. The wash head stays above unused strips for as long as it takes to process each selected strip.

Soak

During a soak step the liquid remains in the wells for the set time with or without shaking of the plate or strips. The soak step can be used in a protocol together with other steps.
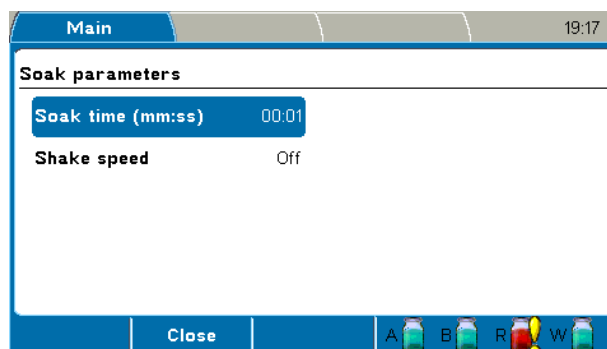
The *Soak* step has the following parameters:

- **Soak time (mm:ss)** – The soak time is the time period between a wash cycle in microplate wash protocols. The minimum value is 00:00 s and the maximum value 60:00 min in increments of 1 s. The default value is *00:01*.

- **Shake speed** –You can define the shake speed Off, Low, Medium or High. The default is *Off*. The shake speed setting is effective only when the soak time is > *00:00*.

Caution Ensure that the liquid does not spill at the shake speed and volume settings that you use. ▲

Prime

Priming is performed to fill the liquid system of the instrument with liquid and to remove all air from the tubes. A priming step must also be performed when switching between buffers.

A protocol should have prime steps for the proper channels to ensure that the tubing is filled correctly with the desired liquid before performing any wash or dispense steps. The tubing volume should be at least 15 ml to fill the line all the way from the intake port to the wash head. A prime function is requested before a protocol is started and it can be accepted or rejected.

The prime step can be used in a protocol together with other steps.

If the instrument will be left to stand for a longer time, priming must be performed with air to remove all liquid from the system. Raise the tube from the liquid to allow air to enter the tube.

Note Avoid unnecessary priming with air. ▲
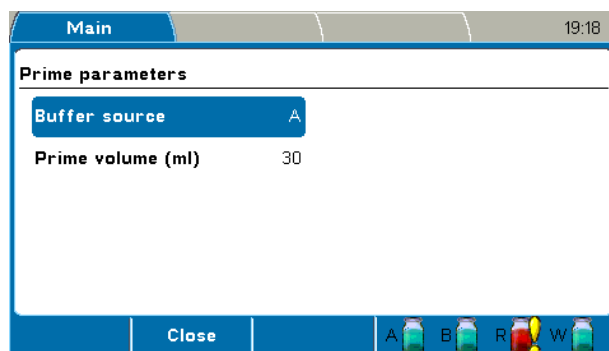
The *Prime* step has the following parameter:

- **Buffer source** – You can define the reagent source channel A, B, or Rinse. The default is *A*.
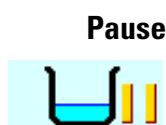
- **Prime volume (ml)** – The prime volume ranges from 5 ml to 100 ml in 5 ml increments. The default is *30 ml*.

Priming is carried out in the priming position. Aspiration is on while priming. At the end, the priming vessel is aspirated empty and the wash head is driven to the home position.

Pause

You can stop a protocol momentarily and then start the protocol again. The *Pause* step can be used in the protocol together with other steps.
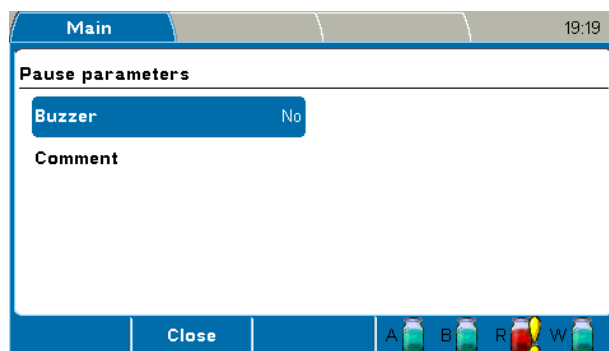
The *Pause* step has the following parameters:

- **Buzzer** – You can set the buzzer ON (= Yes) or OFF (= No). There is a beep when the *Pause* step starts. The default is *No*.

- **Comment** – You can add text, such as instructions. There is space for 256 characters.

To end the pause step, press the **OK** key to continue the protocol execution. A three second alarm is sounded.

Layout

The *Layout* step lets you select strips on the plate. This step determines the area on which the next steps are processed.

The layout is landscape when a 1 x 8, 2 x 8 or 1 x 16 wash head is selected and portrait when a 1 x 12 or 2 x 12 wash head is selected. The strips are numbered 1-12 if an n x 8 wash head is used. The strips are

marked A–H if an n x 12 wash head is used. The strips are numbered 1–24 if a 1 x 16 wash head is used.

If there is no *Layout* step in the protocol, the processed area is according to the Main > **Layout** row selection.

Note Only the strips that are selected to the *Layout* step are saved with the protocol. Strips selected using the **Layout** row or the number keys are not saved. ▲
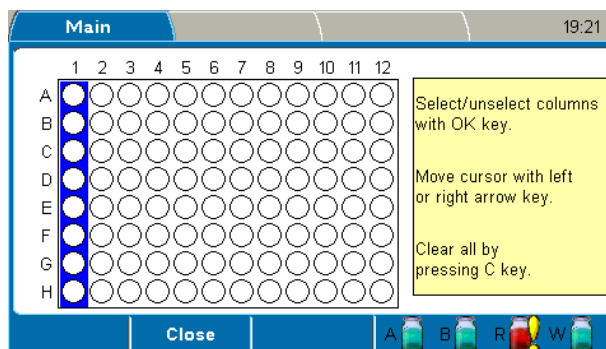
Strips 1–12 are edited if an 8-way wash head is used or strips A–H if a 12-way wash head is used.

The selected strips are highlighted with red color.
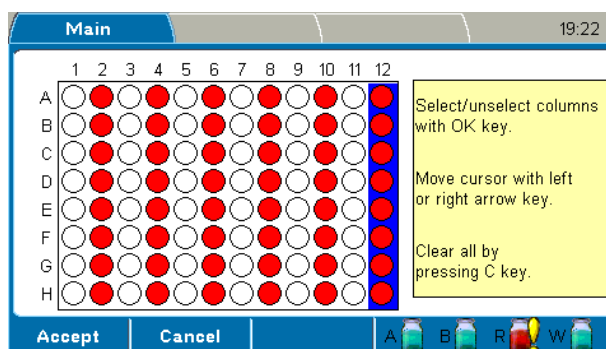
If the Layout step is the first step in the protocol, the selected wells are shown in blue color on the **Layout** row in the **Main** menu. The **Layout** row is also locked.

If the Layout step is not the first step in the protocol, the **Layout** row is not locked but enabled. You can select strips using the row until the first layout step in the protocol is encountered.

Layout row

There are two ways to select strips in the **Main** menu. The first is by selecting the **Layout** row and the second is by using the number keys.

Refer to "Strip selection with the Layout row" on page 42 and to "Strip selection with the number keys" on page 41.

Settings menu

You can specify the instrument settings in the **Settings** menu.

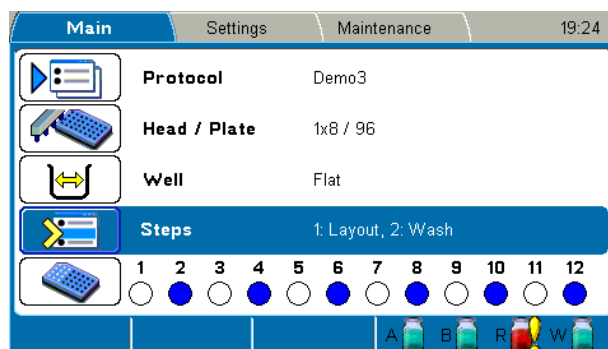The **Settings** menu contains the **Prime & rinse parameters**, **Sensors**, **Wash head configuration**, **System** and **Reports** parameters.
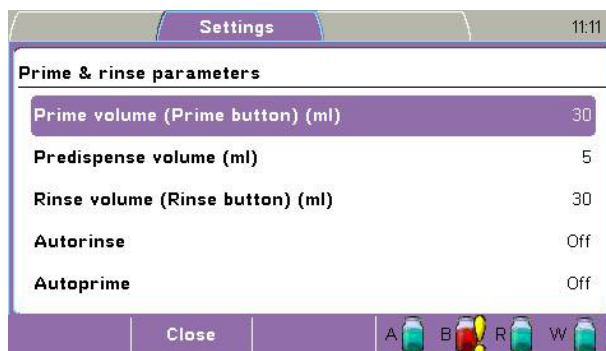

Prime & rinse parameters

The prime and rinse parameters can be set in the **Prime & rinse parameters** window.

OK

Go to the **Prime & rinse parameters** row in the **Settings** menu and press the **OK** key.

Warning If you activate the **Autorinse** or **Autoprime** parameter, ensure that the wash heads are firmly attached. ▲

The **Prime & rinse parameters** window has the following parameters:

- **Prime volume (Prime button) (ml)** – The prime volume ranges from 5 ml to 100 ml in 1 ml increments. The default is *30 ml*.

- **Predispense volume (ml)** – The predispense volume ranges from 1 ml to 20 ml in 1 ml increments or it can be set OFF. The default is *5 ml*.

- **Rinse volume (Rinse button) (ml)** – The rinse volume ranges from 5 ml to 100 ml in 1 ml increments. The default is *30 ml*.

- **Autorinse** – The washer can be programmed to rinse the system automatically using the rinse liquid with a selected volume. At the end of the run, the software starts to count down the selected time. 30 seconds before the autorinse starts, the buzzer gives an audible sound and the remaining time is shown on the display. When the time reaches zero, rinsing starts.

  - **Volume (ml)** – The autorinse volume ranges from 5 ml to 100 ml in 1 ml increments. The default is *30 ml*.

  - **Time (hh:mm)** – The times range is from 00:00 (= Off) to 12:00 in increments of 1 h or 1 min. The default is *Off*.

- **Autoprime** – Periodically primes the instrument at a set interval to ensure that the instrument stays primed and ready to be used at all times. Autoprime is not recommended for long time intervals (overnight), instead, use the soak wash head function. Refer to "Soak wash head" on page 78.

  - **Volume (ml)** – The autoprime volume ranges from 1 μl to 30 μl in 1 μl increments. The default is *5 μl*.

  - **Time (hh:mm)** – The time ranges from 0:00 (= Off) to 9:00 in increments of 15 min. The default is *Off*.

Sensors

Liquid level sensors are built into the caps of all containers to avoid overflow of the waste container and to warn the user when the liquid containers are almost empty.

The different reagent sensors and the waste sensor can be enabled or disabled in the **Sensors** window.

OK

Go to the **Sensors** row in the **Settings** menu and press the **OK** key.

The **Sensors** window has the following parameters:

- **Buffer A sensor** – You can disable or enable the buffer A sensor. The default is *Enabled*.

- **Buffer B sensor** – You can disable or enable the buffer B sensor. The default is *Enabled*.

- **Buffer Rinse sensor** – You can disable or enable the buffer Rinse sensor. The default is *Enabled*.

- **Buffer Waste sensor** – You can disable or enable the buffer Waste sensor. The default is *Enabled*.

- **Plate sensor** – You can disable or enable the plate sensor. The default is *Enabled*. When enabled, the instrument checks whether there is a plate on the plate carrier at the beginning of the protocol run.

Wash head configuration

You must always set the wash head configuration to correspond to the physically installed wash head. Refer to "Head / Plate" on page 57.

OK

Go to the **Wash head configuration** row in the **Settings** menu and press the **OK** key.

The **Wash head configuration** window has the following parameters:

- **Wash head** – You have to ensure that the installed wash head is the same as set in the **Wash head configuration** window. The default is *2x8 / 96*. Press **OK** to select the correct wash head from the list:

  - **1x8 / 96**

  - **1x12 /96**

  - **1x16 / 384**

  - **2x8 / 96**

  - **2x12 / 96**

Warning An incorrect wash head configuration can cause liquid spillage. ▲

System

The system parameters are set in the **System** window.

OK

Go to the **System** row in the **Settings** menu and press the **OK** key.
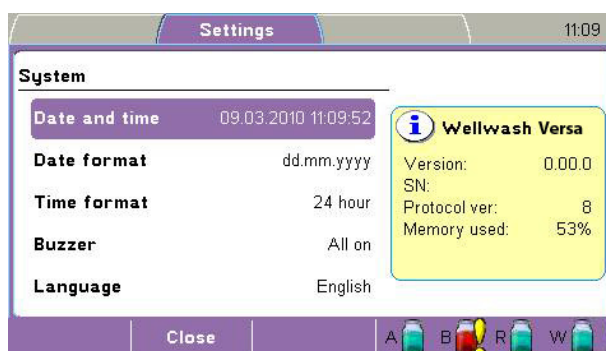
The **System** window has the following parameters:

- **Date and time** – The date and time is set in the *dd.mm.yyyy hh:mm:ss* format.

- **Date format** – You can select the date format dd-mm-yyyy, dd/mm/yyyy, dd.mm.yyyy, yyyy-mm-dd, or mm/dd/yyyy. The default is *dd.mm.yyyy*.

- **Time format** – You can select the time format 12 hour or 24 hour. The default is *24 hour*.

- **Buzzer** – You can disable or enable the buzzer. The default is *Enabled.*

- **Language** – You can set the preferred user interface language. The language covers all parts of the software and the displayed language on the instrument: user interface, Help, errors and warnings, log files, and exported data. The default is *English*. NOTE! Languages other than English are not yet available.

  - **English**
  - **中文** (= Chinese)
  - **Français** (= French)
  - **Deutsch** (= German)
  - **日本語** (= Japanese)
  - **Português** (= Portuguese)
 - **Русский** (= Russian)
  - Español (= Spanish)

The following information related to the instrument is also visible in the **System** window:

- **Version**: – Version of the internal software

- **SN**: – Serial number of the instrument

- **Protocol ver**: – Version of the protocol parameter set. The version can change with a new internal software version. For the best compatibility, ensure that the protocols are of the same version.

- **Memory used**: – The amount of protocol memory that is in use as a percentage of total memory.

Reports You can export the available reports to a USB memory stick for viewing, printing or saving them.

To export a report, attach a USB memory stick to the USB memory stick port in the instrument, select the desired report and press the **OK** key. The selected report is exported to the USB memory stick under an automatically created folder named "Wellwash".
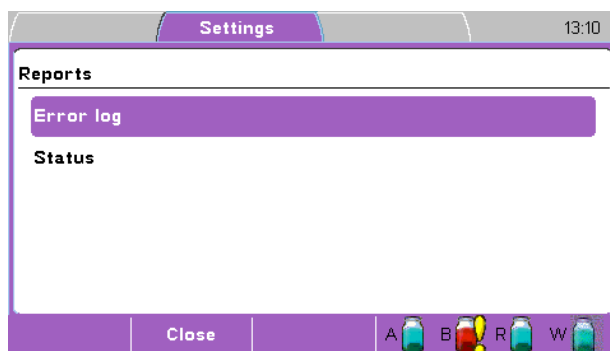
The reports available are:

● **Error log** – The error log shows the date and time of the error and the error(s).

● **Status report** – The status report shows the following parameters: report name, date and time, instrument name, version and serial number, current protocol, prime and rinse parameters, sensor settings and status, wash head configuration, system settings, calibration parameters for all wash heads, offset values, and pump usage hours.

Maintenance menu

You can specify the maintenance procedures in the **Maintenance** menu.

The **Maintenance** menu contains the **Clean**, **Calibration** and **Service** parameters.
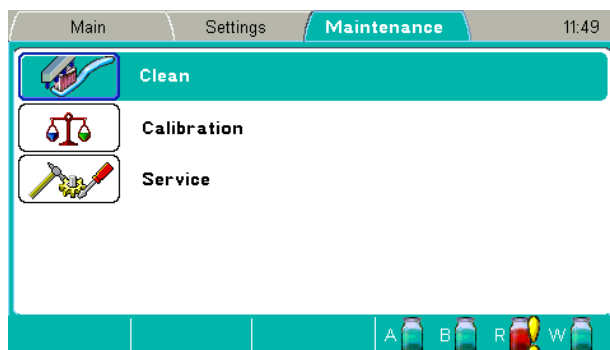
Clean

Cleaning and disinfection procedures are set in the **Clean** window.

The **Clean** window has the following parameters:

- **Cleaning/Disinfection procedure** (see "Cleaning/Disinfection procedure" on page 74)

- **Clean wash head** (see "Clean wash head" on page 76)

- **Soak wash head** (see "Soak wash head" on page 78)

- **Move wash head** (see "Move wash head" on page 80)

- **Empty priming vessel** (see "Empty priming vessel" on page 81)

Cleaning/Disinfection procedure

Cleans or disinfects the instrument according to a set of actions. Refer to Chapter 10: "*Maintenance*", particularly "Decontamination procedure" on page 102.

To clean or disinfect the instrument:

OK

1. Press the **OK** key on the **Cleaning/Disinfection procedure** row.

OK
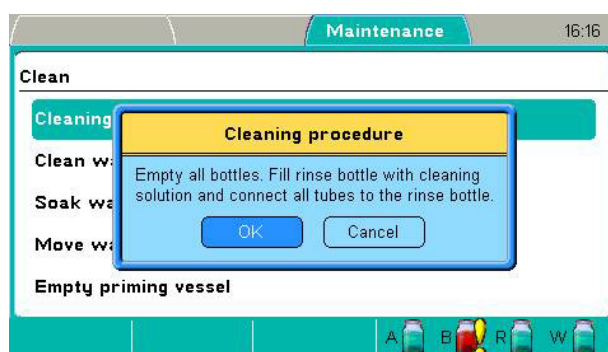
2. Empty all containers and fill the rinse container with cleaning reagent and connect all tubes to the rinse container. Press the **OK** key.
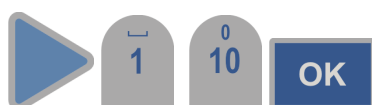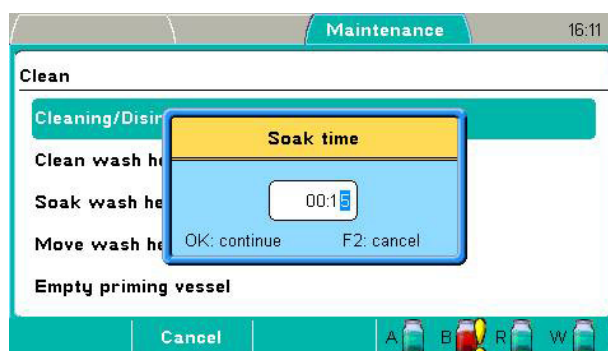
3. Select the soak time using the **Right** arrow key and number keys. The default is *15 min*. Press the **OK** key.
   Priming, preparing the soak and soaking take place.

4. Press the **F2** key to abort the soaking if you want a shorter soak time than the set soak time and to continue the procedure. Priming is then carried out.
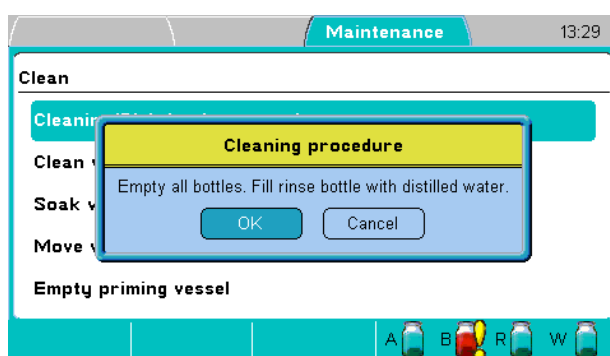
5. Empty all containers and fill the rinse container with distilled water. Press the **OK** key.
   Priming, preparing the soak and soaking take place. The default soak time is *2 s*. Finally the priming vessel is emptied.

OK
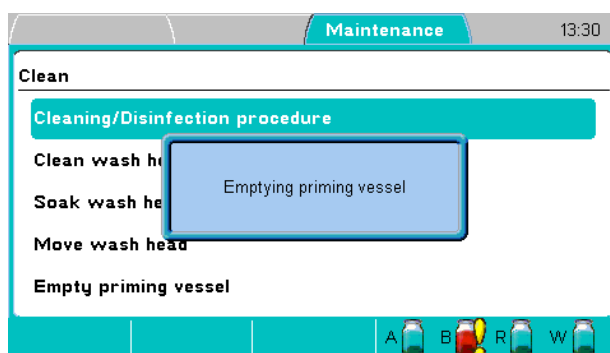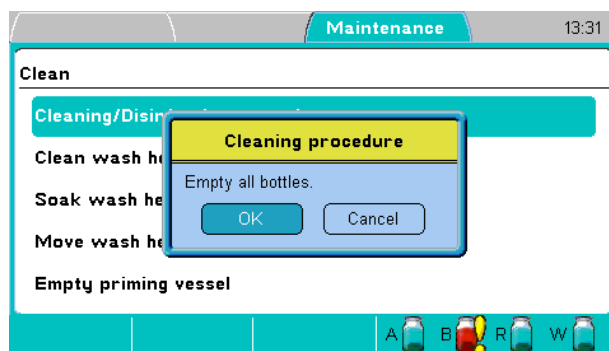
6. Empty all containers and press the **OK** key. Priming is then carried out.

OK

7. Press the **OK** key when the procedure is ready.

Clean wash head

The procedure cleans the wash head according to a set of actions when necessary. Carry out this procedure if the wash heads are dirty or clogged.

The instrument fills the priming vessel with a selected liquid and soaks the wash head for a selected period of time.

Note Use a suitable cleaning agent and repeat the procedure with distilled water. ▲

To clean the wash head:

OK

1. Select the **Clean wash head** row using the **Down** arrow key and press the **OK** key.
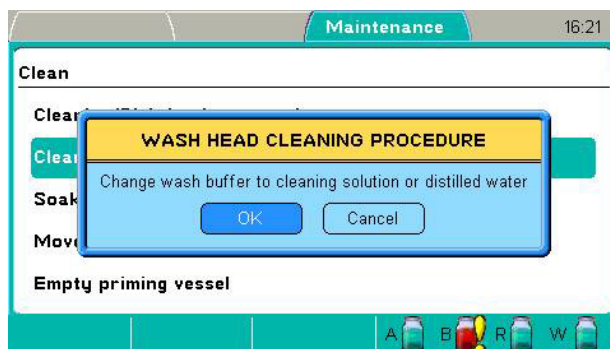
2. Change the wash buffer to cleaning agent or distilled water. Press the **OK** key.
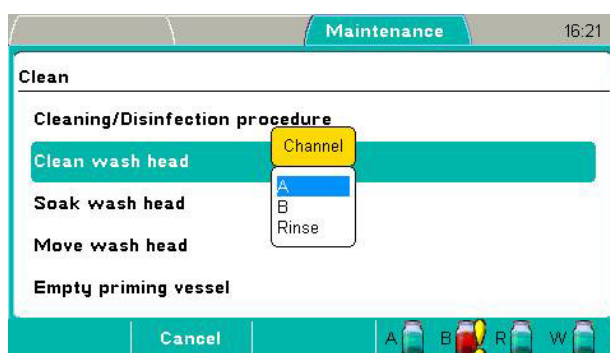
3. Select the priming channel using the **Down** arrow key and/or press the **OK** key.
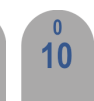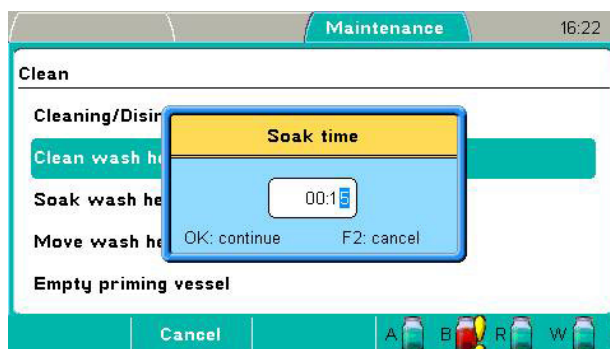
4. Select the soak time using the **Right** arrow key and number keys. The default is *15 min*. Press the **OK** key.
Priming, preparing the soak and soaking take place.
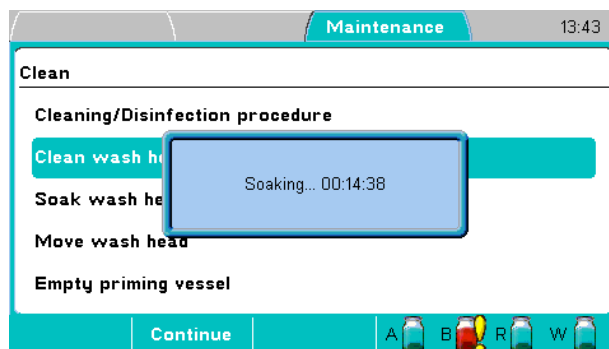
5. Press the **F2** key to stop the soaking if you want a shorter soak time than than the set soak time and to continue the procedure. Priming is then carried out.
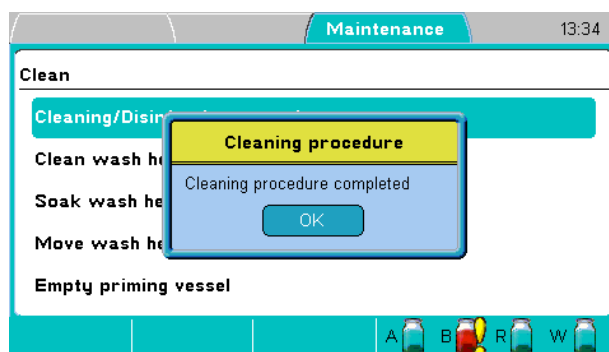

6. Press the **OK** key when the procedure is ready.
   Repeat the wash head cleaning procedure with distilled water if cleaning agent has been used.

Soak wash head   Soaks the wash head according to a set of actions if necessary. The wash head is soaked in liquid (standby) to prevent clogging. The instrument fills the priming vessel with a selected liquid and leaves the wash head immersed in the solution. This procedure can be used for a shorter period of time between washes using a wash buffer or to soak for an extended period, for example, overnight, using distilled water (Rinse channel).

To soak the wash head:

1. Select the **Soak wash head** row using the **Down** arrow key and press the **OK** key.
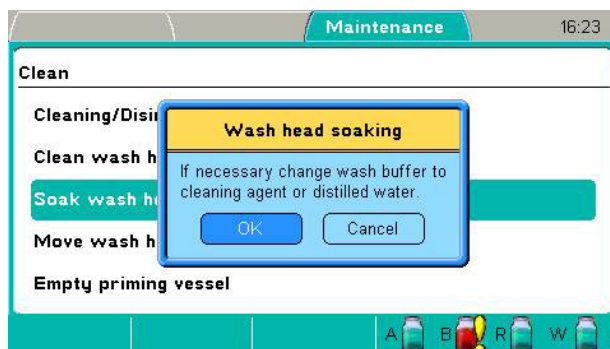
2. Change the wash buffer to cleaning agent or distilled water if necessary. Press the **OK** key.
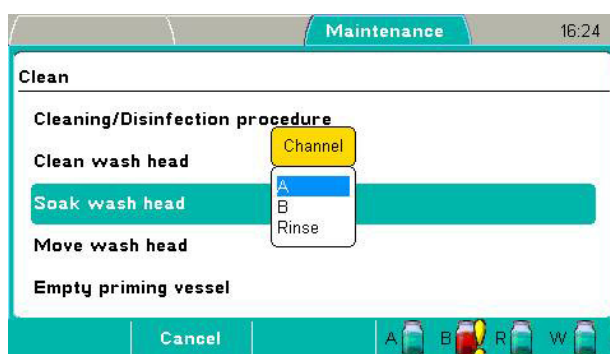
3. Select the priming channel using the **Down** arrow key and/or press the **OK** key.
Priming, preparing the soak and soaking take place.
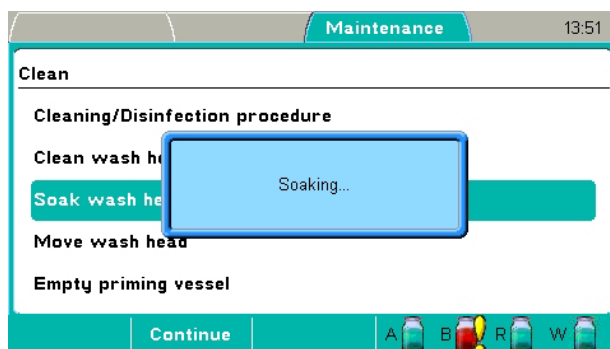
4. Press the **F2** key to abort the soaking and to continue the procedure. The priming vessel is emptied.

OK
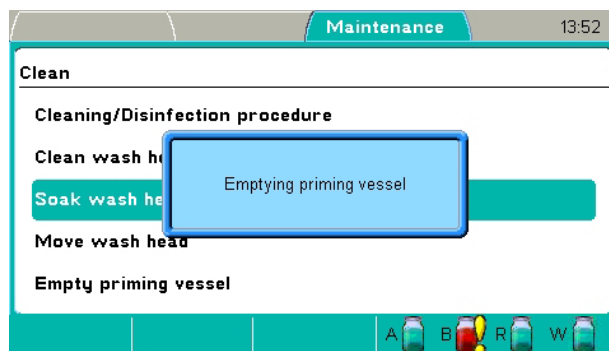
5. Press the **OK** key when the procedure is ready.
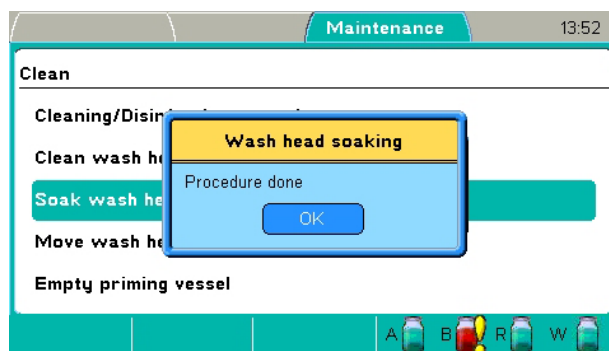
Move wash head — The procedure moves the wash head down into the priming vessel to the soak position. You must add distilled water or a suitable cleaning agent manually into the priming vessel.

This procedure can be used to leave the wash head in liquid (standby) or when a clogged wash head is cleaned and the instrument pump cannot be used to fill the priming vessel.

To move the wash head:

OK

1. Select the **Move wash head** row using the **Down** arrow key and press the **OK** key.

OK
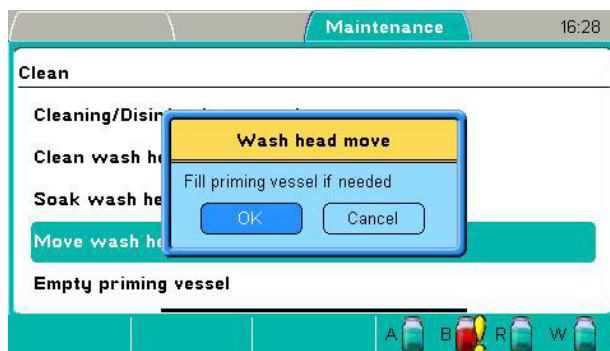
2. Fill the priming vessel manually if necessary. Press the **OK** key. Preparing to soak and soaking take place.

F2
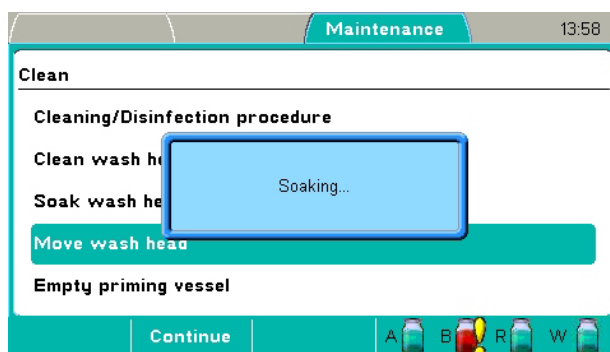
3. Press the **F2** key to abort the soaking and to continue the procedure.

OK

4. Press the **OK** key when the procedure is ready.

Empty priming vessel   The procedure empties the priming vessel of liquid. The procedure can be carried out, for example, after the *Move wash head* procedure. Refer to "Move wash head" on page 80.

To empty the priming vessel:

OK

1. Select the **Empty priming vessel** row using the **Down** arrow key and press the **OK** key.

OK
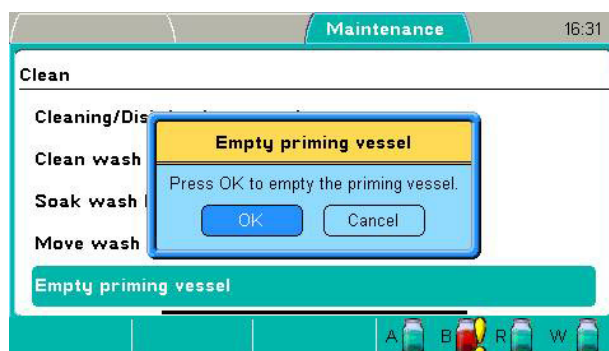
2. Press the **OK** key to empty the priming vessel
   The priming vessel is emptied.

OK

3. Press the **OK** key when the procedure is done.

Calibration

All the calibration procedures are set in the **Calibration** window.
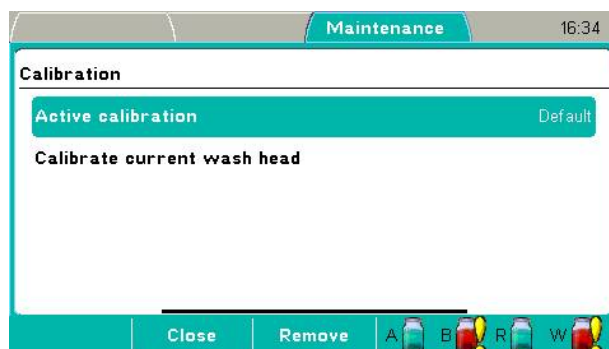
The following calibrations are available:

● **Active calibration** (see "Active calibration" on page 82)

● **Calibrate current wash head** (see "Calibrate current wash head" on page 83)

Active calibration

You can select either Factory or User.

● **Factory** – Factory default calibration for the wash head selected in the **Settings.**

● **User** – An actual calibration of the wash head performed by a user. The date of the last user-defined calibration is shown. This may have also been performed at the factory.

Calibrate current wash head

The gravimetric calibration is performed in the **Calibrate current wash head** window. It is recommended to calibrate the wash head when the dispensed volume is incorrect or when needed.

Calibration principle:

- Gravimetric 2-point linear regression curve at 100 µl and 300 µl. The valve times in the calibration are based on the factory default values of the wash head.

- Two plates are filled with 100 µl and other two with 300 µl. The tare weighed mass of each plate is entered in the display.

- Whenever a mass is entered, the mean volume per well and accuracy % is calculated.

- All wash head configurations have their own calibration curves done at the factory.

- Calibration is only done to the active wash head defined in the **Settings** menu.

- The calibration is performed with the original factory values.

To carry out the gravimetric calibration:

1. Select the **Calibrate current wash head** row using the **Down** arrow key and press the **OK** key.
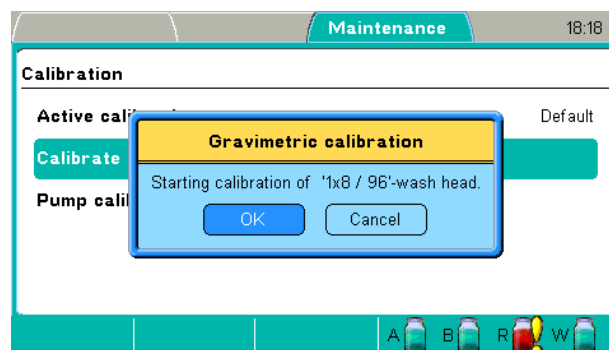
2. Press the **OK** key to start the calibration of the wash head.

3. Select the used channel using the **Up** arrow key and/or press the **OK** key.

4. Insert the first tare weighed plate onto the plate carrier and press the **F1** key to continue.
   Dispensing is carried out.

5. Weigh the dispensed plate and enter the mass of the dispensed liquid using the number keys. Press the **OK** key when ready.

6. Insert the second tare weighed plate onto the plate carrier and press the **F1** key to continue.
   Dispensing is carried out.
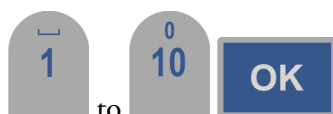
7. Weigh the dispensed plate and enter the mass of the dispensed liquid using the number keys. Press the **OK** key when ready.

8. Press the **F1** key to continue the calibration
   OR
   Press the **F2** key to cancel the calibration
   OR
   Press the **F3** key to repeat the calibration if the calibration accuracy is not good enough. The accuracy of the first plate must be ± 50% and that of the second plate must be ± 5%.

9. Continue dispensing and weighing the third and fourth plate in the similar way.
   At the end, you should have the mass of both plates entered and their accuracy calculated.

10. Press the **F1** key to continue the calibration
    OR
    Press the **F2** key to cancel the calibration
    OR
    Press the **F3** key to repeat the calibration if the calibration accuracy is not good enough. The accuracy must be 2.5–3.5 x that of 100 µl.

11. Calibration is now ready. Press the **F1** key to accept the new calibration.
    The calibration for the wash head is saved and it becomes the active calibration.

OK   12. Press the **OK** key when the procedure is done.

Note The accuracy indicates how much the current performance differs from the original factory default values. ▲

After the calibration, verify the new performance by dispensing a plate, for example, with 300 µl. Weigh the plate to determine the accuracy.

Service   All the relevant service procedures are set in the **Service** window.

	Maintenance	10:14
Service		
Dispense speed calibration		
	Close	A B R W
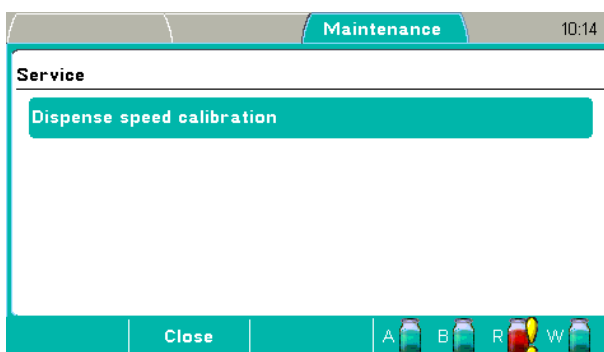
The **Service** window has the following parameters:

Dispense speed calibration – Calibrates the dispensing pump speed.

Calibrate dispensing pump speed   The dispensing pump speed calibration is performed in the **Service** window.

Principle:

- Dispensing pump speeds over the required operating range are automatically calibrated using the liquid in the buffer A bottle.
- Calibration is always performed with the 2 x 8 wash heads.
- Dispense speed calibration should be performed if the gravimetric calibration fails or after every 10,000 dispensed plates.

To calibrate the dispensing pump speed:

OK   1. Select the **Dispense speed calibration** row using the **Down** arrow key and press the **OK** key.
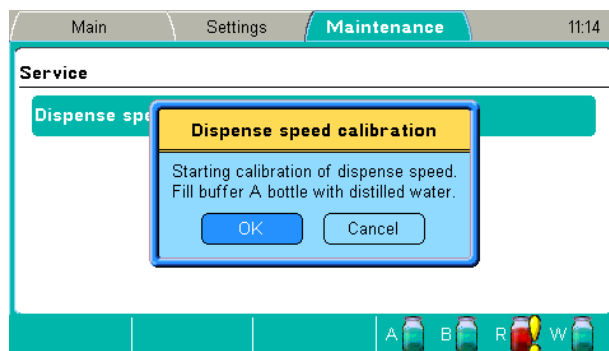
OK   2. Fill the buffer A bottle with distilled water and press the **OK** key. Dispensing pump speed is calibrated.
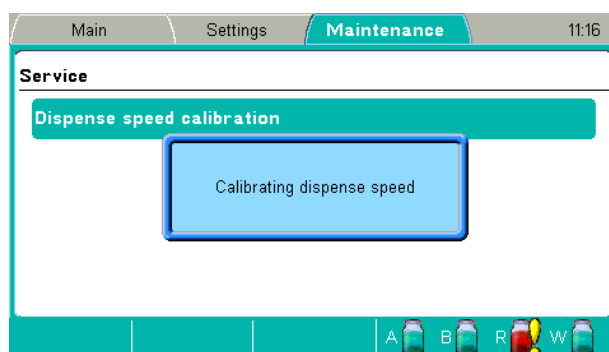
Chapter 6
Exporting and Importing

This section describes how to export or import wash protocols from one instrument to another.

Exporting a protocol

To export a protocol from the instrument to a USB memory stick:

1. Insert the USB memory stick (Figure 6–25).

Figure 6–25. USB memory stick inserted

OK

2. Go to the **Protocol** row in the **Main** menu and press the **OK** key. The list of protocols appears.

3. Select the protocol you want to export with the **Down** arrow key.

> **OK**

4. Press the **FILE** key to open the **File** menu.

> **OK**
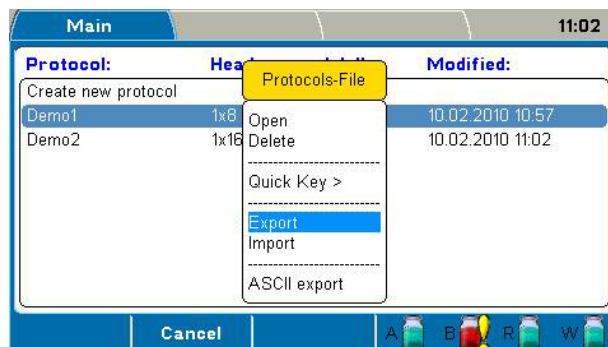
5. Select **Export** with the **Down** arrow key and press the **OK** key.

The protocol is exported to the USB memory stick under an automatically created folder named *Wellwash*. The file extension of an exported protocol is *.PRO*. The file is in binary format. You can export protocols one at a time.

Importing a protocol

To import a protocol from a USB memory stick to the instrument:

1. Insert the USB memory stick (Figure 6–25).

> **OK**

2. Go to the **Protocol** row in the **Main** menu and press the **OK** key. The list of protocols appears.

> **OK**
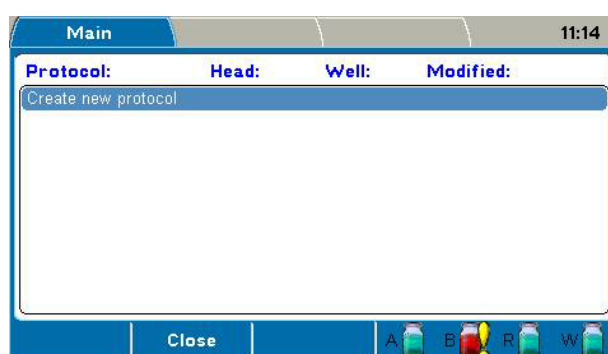
3. Press the **FILE** key to open the **File** menu.
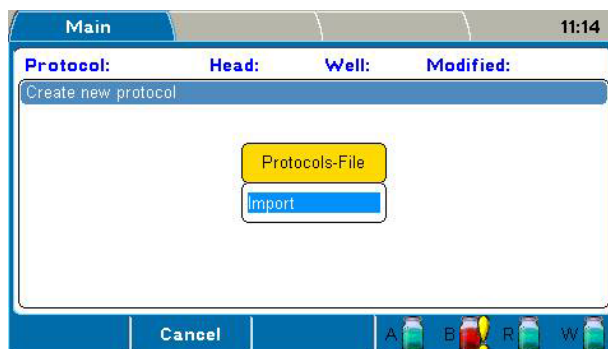
4. Select **Import** with the **Down** arrow key and press the **OK** key. A list of protocols stored on the USB memory stick opens.

5. Select the protocol you want to import with the **Down** arrow key and press the **OK** key. You can import protocols one at a time.

The protocol is imported to the instrument and it is available on the list of protocols. It is possible to import protocols also from the Wellwash instrument.

Exporting a protocol as text file

You can export a protocol as a text file to a USB memory stick. The text file has information about the procol, such as the name, the steps and their parameters, modification date, wash head, well type and well offset.

To export a protocol as a text file:

1. Insert the USB memory stick (Figure 6–25).

2. Go to the **Protocol** row in the **Main** menu and press the **OK** key. The list of protocols appears.

3. Select the protocol you want to export with the **Down** arrow key.

4. Press the **FILE** key to open the **File** menu.
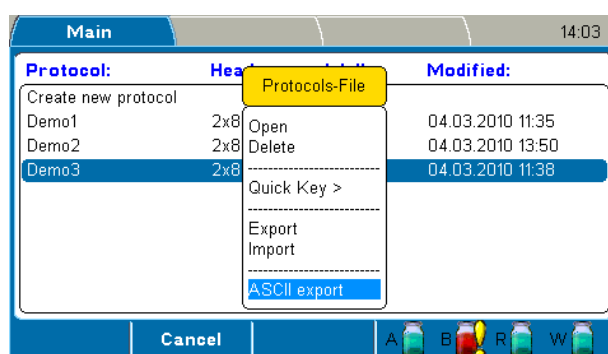
5. Select **ASCII export** with the **Down** arrow key and press the **OK** key.

The protocol is exported to the USB memory stick. You can open the file with a text editor, print it or save it.

Chapter 7
Shutdown

Shutting down To shut down the Wellwash Versa:

1. Remove any plates still in the instrument.

2. Rinse the liquid system with distilled water to remove any buffer solution from the liquid lines and wash head. The rinsing procedure should be performed if the instrument is left to stand or is switched off at the end of operation.

   If the instrument will be left to stand for a short time during the same day, the wash head can be immersed in wash buffer or distilled water. Refer to "Soak wash head" on page 78 and "Move wash head" on page 80.

   Caution If the wash head is not rinsed, the tips may become clogged. If this occurs, the wash head will need repairs or may have to be replaced. ▲

3. If the instrument will be left to stand for a longer time, priming must be performed to remove all liquid from the system. For this purpose, remove all tubes from the liquid containers. Prime the instrument without liquid to empty all liquid from the system.

4. Switch OFF the instrument.

5. If you have spilt infectious agents on the instrument, disinfect with 70% ethanol or another disinfectant (see "Decontamination procedure" on page 102).

   Warning The wash heads and priming vessel may be infectious after the instrument has been used. ▲

   Warning When handling waste containers, it is advisable to adhere to applicable safety precautions, including the wearing of powder-free gloves, safety glasses and protective clothing, to avoid potential infectious disease contamination. ▲

Shutdown
Shutting down

Chapter 8
Emergency Situations

Handling emergency situations

In case there is any abnormal situation during operation, such as fluids spilling inside the instrument:

1. Switch OFF the instrument (Figure 2–4 on page 16).

2. Unplug the instrument immediately from the power supply (Figure 2–3 on page 16).

3. Carry out appropriate corrective measures. However, do not disassemble the instrument.

4. If the corrective measures taken do not help, contact authorized technical service or your local Thermo Fisher Scientific representative.

Emergency Situations
Handling emergency situations

Chapter 9
Maintenance

Regular and preventative maintenance

Contact local authorized technical service or your local Thermo Fisher Scientific representative for assistance, if necessary.

Maintenance checklist

This chapter contains an outline of the points mentioned in the checklist below (Table 9–6).

Table 9–6. Maintenance checklist

Item	Daily	Weekly	Monthly	Yearly	If needed
Rinse the instrument with deionized distilled water after use. See "Instrument care" on page 98.	✓				
Keep the instrument free of dust. See "Instrument care" on page 98.	✓				
Wipe away spilled saline solutions, solvents, acids or alkaline solutions from outer surfaces immediately to prevent damage, and wipe with deionized distilled water. See "Cleaning the instrument" on page 98.	✓				
If any surfaces have been contaminated with biohazardous material, disinfect with a mild sterilizing solution. See "Instrument care" on page 98.	✓				
Clean the case of the instrument periodically. See "Cleaning the instrument" on page 98.		✓			
Clean the plate carrier when necessary. See "Cleaning the plate carrier" on page 99.		✓			
Clean the liquid containers regularly. See "Cleaning liquid containers" on page 100.	✓	✓			
Replace the wash head when necessary. See "Replacing the wash head(s)" on page 101.					✓
Ensure proper shutdown. See Chapter 8: "*Shutdown*".	✓	✓			
Decontaminate the instrument when relocating the instrument or sending it for service. See "Decontamination procedure" on page 102.					✓
Service the instrument regularly. See "Cleaning the instrument" on page 98 and "Maintaining a system log" on page 105.				✓	

✓ = depending on the laboratory conditions and the use and configuration of the instrument

Instrument care

Routine and service procedures must be performed by the user to prevent unnecessary wear or hazards and are described below at the frequency with which they should be applied.

Always ensure that the electrical supply in the laboratory conforms to that specified on the type label of the instrument.

To guarantee the continuous reliability and accuracy of the Wellwash Versa:

● Rinse the instrument with deionized distilled water after use.

● Prevent any liquid from entering the instrument.

● Keep the instrument free of dust and other foreign matter.

● Perform the operational check regularly (see "Performing the operational check" on page 35).

In the event of any damage, contact your local Thermo Fisher Scientific representative for service.

Abrasive cleaning agents are not recommended, because they are likely to damage the paint finish.

It is recommended that you clean the case of the instrument periodically to maintain its good appearance (see "Cleaning the instrument" on page 98).

Clean the keypad surface with a mild laboratory detergent.

Plastic covers and surfaces can be cleaned with a mild laboratory detergent or alcohol.

Warning If any surfaces have been contaminated with biohazardous material, a mild sterilizing solution should be used. ▲

Caution Do not use the instrument to aspirate or dispense any acidic solutions as this could damage the instrument. ▲

Caution Never use acetone as it will damage the covers. ▲

Caution Do not autoclave any part of this instrument apart from the liquid containers, tubes and tube connectors. However, the liquid level sensors or the liquid filters cannot be autoclaved. ▲

Cleaning the instrument

Clean the instrument regularly as stated below.

Caution Although the Wellwash Versa is constructed from high-quality materials, you must immediately wipe away spilled saline solutions, solvents, acids or alkaline solutions from the outer surfaces to prevent damage and wipe them with deionized distilled water. ▲

Caution Painted surfaces can be cleaned with most laboratory detergents. Dilute the cleaning agent as recommended by the manufacturer. Do not expose painted surfaces to concentrated acids or alcohols for prolonged periods as damage may occur. ▲

1. Turn the power OFF and unplug the instrument.

2. Use disposable powder-free gloves.

3. Clean the instrument outside and the plate carrier with a soft cloth dampened with water or mild detergent.

4. If you have spilt infectious agents on the instrument, decontaminate the instrument. Refer to "Decontamination procedure" on page 102.

Caution Do not use any solutions containing hypochlorite, such as bleach, on any of the stainless steel surfaces, as this may cause permanent damage to the finish. ▲

Salt deposit Depending on the concentration of the wash buffers, crystallization may occur around the dispense tips and container necks. Therefore, regular cleaning of these parts is essential. Refer to "Cleaning liquid containers" on page 100 and "Clean wash head" on page 76.

Cleaning the plate carrier

To clean the plate carrier:

Caution Do not disassemble the plate carrier. ▲

1. Turn the power OFF and unplug the instrument.

2. Use disposable powder-free gloves.

3. If spillages have occurred, move the plate carrier by pushing it to the left (Figure 9–26). This makes it easier for you to clean the area under the plate carrier.

4. Wipe both the plate carrier and the area surrounding it with a mild detergent.

5. Clean the plate carrier immediately when spillages have occurred onto or around the plate carrier. Be particularly careful of the area close to the plate clamp!

Figure 9–26. Cleaning the plate carrier and the surrounding area

6. Move the plate carrier back to its normal position once it has been cleaned.

Cleaning liquid containers

Before cleaning the waste container, empty it according to disposal regulations (see "Disposal of materials" on page 101).

The containers must be cleaned regularly depending on the applications, using a mild detergent.

The liquid containers, tubes and tube connectors can be autoclaved some five to ten times. The liquid level sensors or the liquid filters cannot be autoclaved.
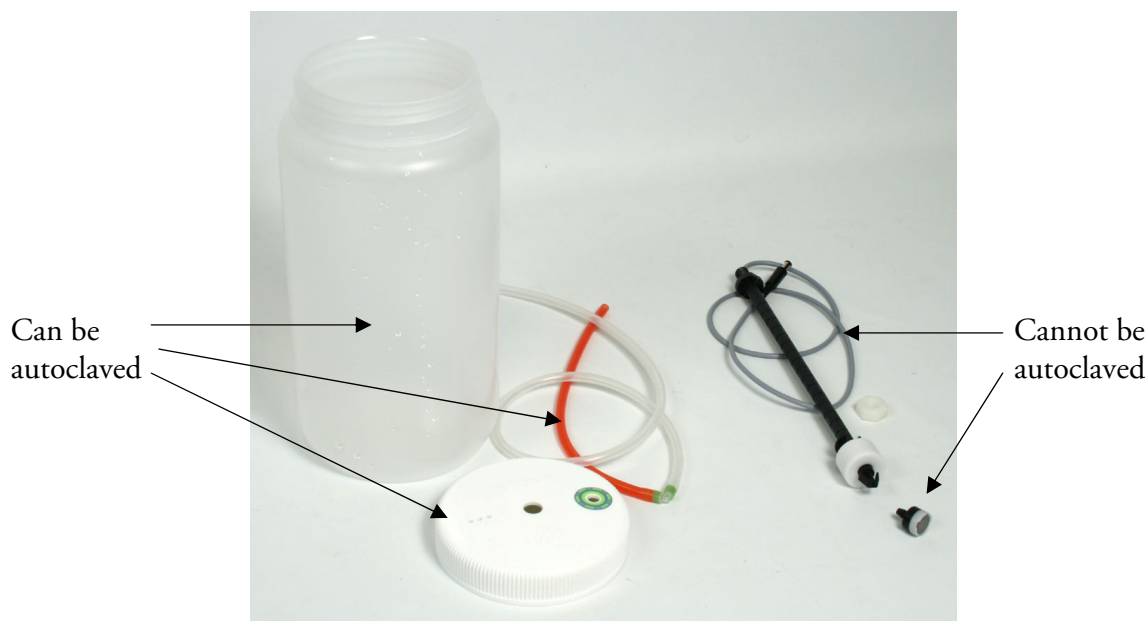
Can be autoclaved

Cannot be autoclaved

⚠️ **Warning** When handling the waste container, it is advisable to adhere to applicable safety precautions, including the wearing of powder-free gloves, safety glasses and protective clothing, to avoid potential infectious disease contamination. ▲

Replacing the wash head(s)

To replace the wash head(s), refer to "Installing the wash head(s)" on page 24.

⚠️ **Warning** The wash heads may be infectious after the instrument has been used. ▲

⚠️ **Warning** Disinfect the wash heads thoroughly before you remove them. ▲

⚠️ **Warning** Prime the instrument without liquid to empty all liquid from the system before removing the wash heads. ▲

⚠️ **Warning** When handling the waste container, it is advisable to adhere to applicable safety precautions, including the wearing of powder-free gloves, safety glasses and protective clothing, to avoid potential infectious disease contamination. ▲

Disposal of materials

Follow laboratory and country-specific procedures for biohazardous or radioactive waste disposal. Refer to local regulations for the disposal of infectious material.

Warning The samples can be potentially infectious. Dispose of all used plates, disposable gloves, syringes, disposable tips, and so on as biohazardous waste. Be cautious and always use gloves. ▲

Warning Treat the used microplate, waste container, priming vessel on the plate carrier, disposables and all substances used in accordance with good laboratory practice (GLP) guidelines. ▲

Warning Inquire about appropriate collecting points and approved methods of disposal in your country, state or region. ▲

Decontamination procedure

If you have spilt infectious agents, carry out the decontamination procedure.

Warning The decontamination procedure should be performed by authorized trained personnel in a well-ventilated room wearing disposable gloves, protective glasses and clothing. ▲

Decontamination should be performed in accordance with normal laboratory procedures. Any decontamination instructions provided with the reagents used should be followed.

It is strongly recommended to perform the complete decontamination procedure before relocating the instrument from one laboratory to another.

Example of decontaminants:

● Ethanol 70%

● Virkon solution 1 – 3%

● Glutaraldehyde solution 4%

● Chloramine T

● Microcide SQ 1:64

● Decon 90 min. 4%

Caution If local or laboratory regulations prescribe regular decontamination, it is not advisable to use formaldehyde, since even small traces of formaldehyde negatively affect the enzyme being used in EIA tests resulting in bad test results. ▲

To decontaminate the instrument:

7. Prepare the decontaminant.

8. Run the Maintenance > **Cleaning/Disinfection procedure** using the prepared decontaminant. Refer to "Cleaning/Disinfection procedure" on page 74.

9. If needed, autoclave the liquid containers, tubes and liquid connectors. However, the liquid level sensors or the liquid filters cannot be autoclaved.

10. Empty the plate carrier. Ensure that you are wearing disposable powder-free gloves.

11. Switch OFF the power and disconnect the power supply cable.

12. Disinfect the outside of the instrument using a cloth dampened with 70% ethanol.

13. Place the instrument in a large plastic bag.

14. Place a cloth soaked in the prepared decontaminant solution into the bag. Ensure that the cloth does not come into contact with the instrument.

15. Close the bag firmly and leave the instrument in the bag for at least 24 hours.

16. Remove the instrument from the bag.

17. After decontamination, clean the instrument using a mild detergent.

18. After performing this decontamination procedure, enclose a signed and dated Certificate of Decontamination both inside the transport package and attached to the outside of the package.

Refitting the transport lock

When you relocate the instrument or ship it for service, make sure that you refit the transport lock.

To refit the transport lock:

1. Align the wash head arm and the plate carrier in order to refit the transport lock screw (Figure 9–27).

Figure 9–27. Aligning the plate carrier and wash head arm

2. Screw on the transport lock screw and the transport lock tag with the supplied Allen key (Figure 9–28).

Figure 9–28. Fastening the transport lock

3. Place small plactic bags around the tubes to protect them during transport.

4. Insert the padded packing material around the plate carrier and wash head arm for protection after the transport lock is refitted (Figure 9–29).

Figure 9–29. Transport lock and tag fitted

Maintaining a system log

A system log, which includes a short summary of the use, maintenance procedures, error messages and other information about the use of the system can be very useful in properly maintaining the system. Refer to Appendix A: "System Log. Copy the table as many times as necessary, but leave the blank original inside the user manual.

Packing for service

To pack the Wellwash Versa for service, follow the instructions presented below:

- Inform Thermo Fisher Scientific about the use of hazardous materials.

- Remove any microplate before decontamination. Decontaminate the instrument. Remove the liquid containers and wash heads.

- Refit the transport lock. Refer to "Refitting the transport lock" on page 103.

- Pack the instrument according to the packing instructions.

- Use the original packaging for shipping.

- Enclose a dated and signed "*Certificate of Decontamination*" (see Appendix B) both inside and attached to the outside of the package, in which you return your instrument (or other items).

- Enclose the return authorization number (RGA) given by your local Thermo Fisher Scientific representative.

- Indicate the fault after you have been in touch with your local Thermo Fisher Scientific representative or the Thermo Fisher Scientific technical service department.

Disposal of the instrument

If the Wellwash Versa is exposed to potentially infectious chemical samples, toxic or corrosive chemicals or radioactive chemicals, waste

management of the complete instrument must be carried out to ensure that there is no risk of contamination.

Warning Decontaminate the instrument before disposal. Refer to "Decontamination procedure" on page 102. ▲

Caution Observe all federal, state and local environmental regulations. ▲

Follow laboratory and country-specific procedures for biohazardous or radioactive waste disposal.

Warning The used lithium (Li) battery is regulated waste and must be disposed of according to strict EPA (Environmental Protection Agency) requirements. The Li battery has to be changed by an authorized service technician only. Instructions for changing the Li battery are described in the service manual. ▲

Dispose of the instrument according to the legislation stipulated by the local authorities concerning take-back of electronic equipment and waste. The proposals for the procedures vary by country.

Pollution degree	2 (see "Safety specifications" on page 109)
Method of disposal	Electronic waste Contaminated waste (Infectious waste)

WEEE symbol Do not treat electrical and electronic equipment as unsorted waste. Collect waste from electrical and electronic equipment separately. ▲

WEEE symbol Thermo Fisher Scientific has contracted with one or more recycling/disposal companies in each EU Member State (European Country), and this product should be disposed of or recycled through them. Further information on Thermo Fisher Scientific's compliance with these Directives, the recyclers in your country, and information on Thermo Scientific products which may assist the detection of substances subject to the RoHS Directive are available at www.thermo.com/WEEERoHS. ▲

Regarding the original packaging and packing materials, use the recycling operators known to you.

For more information, contact your local Thermo Fisher Scientific representative.

Chapter 10
Technical Specifications

General specifications

Thermo Fisher Scientific reserves the right to change any specifications without prior notice as part of our continuous product development program (Table 10–7 and Table 10–8).

Table 10–7. General specifications

General specifications	
Overall dimensions	ca. 345 mm (W) x 385 mm (D) x 240 mm (H) [13.6″ (W) x 15.2″ (D) x 9.4″ (H)]
Weight	9 kg [19.8 lbs.]
Operating conditions	+10°C to +40°C; maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C Indoor use only
Transportation conditions	-40°C to +70°C, packed in transport packaging
Storage conditions	-25°C to +50°C, packed in transport packaging
Mains power supply	100–240 Vac, 50/60 Hz, nominal
Power consumption	100 VA max.
Heat dissipation	341 BTU max.
Display	High-contrast color display with 480 x 272 dots
Keypad	Four arrow keys; **OK** key; three function keys **F1-F3**; **FILE** and **HELP** keys; **0-12** number keys; **a-z** letters, **+ -** and **space** with the number keys; **C** key; **START**, **STOP, PRIME** and **RINSE** keys
User interface	Graphical user interface
Computer interface	USB 1.1 (2.0 compatible) , RS 232
Plate types	96- and 384-well plates
Shaker	Linear shaking, 3 speeds: Low (5 Hz, 2.5 mm), Medium (10 Hz, 1.5 mm) and High (15 Hz, 1 mm)
Number of buffers	2 buffers and 1 rinse buffer

Performance specifications

This section provides the performance specifications for the instrument capabilities.

Table 10–8. Performance specifications

Performance specifications	
Wash volume	50–1000 µl in 50 µl increments (96-well plate)
	20–120 µl in 10 µl increments (384-well plate)
Wash cycles	1–10
Residual volume	< 1.5 µl per well with sweep aspirate mode and with high aspirate speed at room temperature (flat-bottom 96-well plate)
Aspiration height	Adjustable, 0–14 mm in 0.1 mm increments
Dispense volume	50–400 µl in 50 µl increments (96-well plate)
	20–120 µl in 10 µl increments (384-well plate)
Dispense accuracy	± 10% @ 300 µl at room temperature, with 2 x 8 wash head
Dispense precision	CV 3% @ 300 µl (96-well plate)
Soak time	1 s – 60 min in increments of 1 s/min
Rinse time	1–150 s in increments of 1 s
Rinse volume	5–100 ml in 5 ml increments
Prime volume	5–100 ml in 5 ml increments
Memory	99 protocols
Linear shaker	Amplitude 2.5 mm; 5 Hz
	Amplitude 1.5 mm; 10 Hz
	Amplitude 1 mm; 15 Hz

Safety specifications
In conformity with the requirements

This section describes the safety specifications for the Wellwash Versa instrument.

Wellwash Versa bears the following markings:
Type 888
100–240 Vac, 50/60 Hz, 100 VA max., Class I
CE mark

Wellwash Versa conforms to the following requirements:
2006/42/EC (Machinery Directive)
2006/95/EC (Low Voltage Directive)
2004/108/EC (Electromagnetic Compatibility Directive, EMC)
FCC Part 15, Subpart B/Class B
2002/96/EC (Waste of Electrical and Electronic Equipment)

Safety performance:
IEC 61010-1:2001 (Ed. 2), with US and CA National differences
IEC 61010-2-101:2002 (Ed. 1) Particular Requirements for In Vitro Diagnostic (IVD) Medical Equipment

The safety specifications are also met under the following environmental conditions in addition to or in excess of those stated in the operating conditions:	
Altitude	Up to 2000 m
Temperature	+5°C to +40°C
Humidity	Maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C
Mains supply fluctuations	± 10% from nominal
Installation category (overvoltage category)	II according to IEC 60664-1 (see **Note** 1)
Pollution degree	2 according to IEC 60664-1 (see **Note** 2)

Note 1) The *installation category* (overvoltage category) defines the level of transient overvoltage which the instrument is designed to withstand safely. It depends on the nature of the electricity supply and its overvoltage protection means. For example, in CAT II which is the category used for instruments in installations supplied from a supply comparable to public mains, such as hospital and research laboratories and most industrial laboratories, the expected transient overvoltage is 2500 V for a 230 V supply and 1500 V for a 120 V supply.

2) The *pollution degree* describes the amount of conductive pollution present in the operating environment. Pollution degree 2 assumes that normally only nonconductive pollution, such as dust, occurs with the exception of occasional conductivity caused by condensation. ▲

EMC performance:	
EN 61000-6-3:2007	Generic standards – Emission standard for residential, commercial and light-industrial environments
EN 61000-6-1:2007	Generic standards – Immunity standard for residential, commercial and light-industrial environments
EN 61326-1:2006	Product family standard – Electrical equipment for measurement, control and laboratory use
EN 61326-2-6:2006	Product family standard – Electrical equipment for measurement, control and laboratory use; in vitro diagnostic (IVD) medical equipment

Test standards	Performance limits
EN 55011:2007	Class B, 150 kHz – 1 GHz
EN 61000-3-2: 2006	Class A
EN 61000-3-3:1995 + A1:2001 + A2:2005	
ANSI C63.4:2003	Class B, 450 kHz – 1 GHz
EN 61000-4-2:1995 + A1:1998 + A2:2001	4 kV CD, 8 kV AD, Criteria B
EN 61000-4-3:2002 + A1:2002	3 V/m, 80 MHz – 2,7 GHz, Criteria A
EN 61000-4-4:2004	1 kV, Criteria B
EN 61000-4-5:2006	2 kV line to ground, 1 kV line to line, Criteria B
EN 61000-4-6:2007	3 V_{rms}, 150 kHz – 80 MHz, Criteria A
EN 61000-4-8:1993 + A1:2001	3 A/m, Criteria A
EN 61000-4-11:2004	30%/500 ms, Criteria B 60%/100 ms, Criteria B 100%/10 ms, Criteria C 100%/20 ms, Criteria C 100%/5000 ms, Criteria C

Risk management:
EN ISO 12100-1:2003 + A1:2009
EN ISO 12100-2:2003 + A1:2009 with relation to ISO 14971:2007

Chapter 11
Troubleshooting Guide

Note Do not use the instrument if it appears to be malfunctioning. ▲

Note The instrument does not verify the logic flow of the received commands. ▲

Error and warning codes

When an error is detected, the current operation is terminated. After an error, it is best to abort the current run and restart from the beginning after the problem is fixed. To abort, press the **STOP** key after an error and accept by pressing the **OK** key.

The error (Table 11–9) and warning codes (Table 11–10) are presented below.

Table 11–9. Error codes reported

Code	Explanation	Suggested action
2	Computer command not recognized.	
3	Invalid computer command argument.	
4	Plate position error.	Check the carrier movement. Contact authorized technical service.
5	Head position error.	Check the head movement. Contact authorized technical service.
6	Dispense pump rotation error.	The pump is jammed. Contact authorized technical service.
7	Dispense pump time out.	The pump is jammed. Contact authorized technical service.
8	Plate was not detected.	
9	Plate sensor doesn't work.	
10	Non-volatile parameters lost.	Contact authorized technical service.
11	Attempt to reset the serial number.	
12	No more memory for storing user data.	Memory is full, delete unused protocols.
13	Error(s) during startup.	Contact authorized technical service.
20	USBwiz error.	Contact authorized technical service.
21	No firmware on the USBwiz chip.	Contact authorized technical service.
22	XY offset adjustment failed.	

Code	Explanation	Suggested action
23	More than one command has the same hash value.	
25	Parameter memory not found.	Contact authorized technical service.
26	Parameter memory erase failure.	Contact authorized technical service.
27	Parameter memory write failure.	Contact authorized technical service
50	File open error. File not found	
53	The file already exists.	Use a different file name.
54	The file does not exist.	
55	The media is full.	
56	End of file.	
57	Other file error (none of the previous).	
58	Firmware update aborted by user.	
59	File read failed.	
60	File not found.	
61	USB memory stick not present.	Insert a USB memory stick.
62	File write failed.	
70	No enough memory.	
71	Adding the step not successful.	
80	Invalid step parameter(s).	
81	Too many step parameters.	
82	At least one of the step parameters is missing.	
83	Step list is not empty.	
84	Creating a new step list failed.	
85	No strips are selected.	
86	Invalid SOF parameter.	
91	USB device timeout.	

Table 11–10. Warning codes reported

Code	Explanation	Suggested action
101	WAI timer already timed out.	

Troubleshooting guide

The problems covered below are considered faults that require repair or corrective work. If problems orrur or reoccur, contact authorized technical service immediately.

Symptom	Description	Suggested action
Dispensing volume is too low or residual volume is too high.	Tubing is old or clogged.	Clean or replace the tubing.
	Tips are blocked.	Clean the tips.
Dispensing volume is too low.	Filter is blocked.	Clean the inlet filters in the containers.
	The selector valve is not functioning properly.	Component failure. Contact authorized technical service.
Volume is too low.	Tips are deformed.	Change the wash head.
	Leakage in tubing.	Clean or replace the tubing.
Wrong volume is dispensed.	Dispensing valve is leaking when closed.	Component failure. Contact authorized technical service.
	Wash head is incorrectly aligned.	Check that the wash head is properly fitted.
	Improper liquid calibration.	Calibrate the wash head.
	Underpressure in the bottle.	Do not cover the venting holes in the container caps.
	Too low maximum well volume has been defined.	Check the step parameter and adjust it.
	Pump characteristics have changed.	Calibrate the dispensing pump speed. Component failure or wear. Contact authorized technical service.
	Ambient temperature is too high or too low.	Check the ambient temperature.
Wrong volume is aspirated.	Overpressure in the bottle.	Do not cover the venting holes in the container caps.
	Pump characteristics have changed.	Contact authorized technical service
	Wrong parameters are used.	Check the parameters.
Plate is processed incorrectly. Reagents are mixed	A non-active valve is leaking.	Component failure. Contact authorized technical service.
Keys of the keypad do not function.	Keypad is broken.	Contact authorized technical service.
Display does not show all the information or anything at all.	Display is broken.	Contact authorized technical service.

Liquid is dispensed onto the plate carrier.	The plate orientation is incorrect.	Check the layout and place the plate in the correct orientation required by the wash head configuration.
	The installed wash head is incorrect.	Check the wash head and replace the correct wash head required by the layout and the protocol.
Liquid is spilled during operation.	Well volume or shake speed is too high.	Decrease the well volume or shake speed.

Chapter 12
Ordering Information

Contact your local Thermo Fisher Scientific representative for ordering and service information (Table 12–11 through Table 12–13).

Wellwash Versa

Table 12–11. Instrument catalog number

Code	Item
5165010	Wellwash Versa
5165030	Wellwash Versa (Fisher Scientific)

List of spare parts and accessories

Table 12–12. Codes for spare parts and accessories

Code	Item	Quantity
N11166	*Wellwash Versa User Manual, CD*	1
N11167	*Wellwash Versa User Manual, Printed*	1
N11165	*Wellwash Versa Quick Reference Guide*	1
N09541	Priming vessel SW smooth blue	1
N10800	1x8 wash head	1
N10801	1x12 wash head	1
N10803	1x16 wash head, Wellwash Versa	1
N10804	Blank wash head, Wellwash Versa	1
N10807	2 liter wash bottle A, Wellwash Versa	1
N10808	2 liter wash bottle B, Wellwash Versa	1
N10809	2 liter rinse bottle, Wellwash Versa	1
N10810	4 liter waste bottle square	1
N10811	4 liter wash bottle A, round	1
N10812	4 liter wash bottle B, round, Wellwash Versa	1
N10813	4 liter rinse bottle, round, Wellwash Versa	1
N10814	9 liter waste bottle, rectangular, Wellwash Versa	1
N10816	Aerosol cover, Wellwash Versa	1
N10818	Bottle stand 2x2 configuration (3x2 l bottles, 1x4 l bottle (square)), Wellwash Versa	1
N10819	Bottle stand 1x4 configuration (3x2 l bottles, 1x4 l bottle (square)), Wellwash Versa	1

Code	Item	Quantity
N10820	Small bottle stand for own bottles	1
N10821	Spare bottle 2 l	1
N10822	Spare bottle 4 l (round)	1
N04001	USB A-B device cable *	1
2305290	Serial cable F9/F25	1

* longer USB cables available from PC stores

List of Thermo Scientific plates

Table 12–13. Codes for plates

Code	Item
439454	Nunc solid F96
464718	Nunc F384
430341	Nunc C96
449824	Nunc U96
249662	Nunc V96
441653	Nunc Starwell strip plate

Appendix A
System Log

Instrument name/number:

User	Date	Comments

PHOTOCOPIABLE

System Log

Appendix B
Certificate of Decontamination

Name: _____

Address: _____

Tel./Fax: _____

Instrument Name: _____ Serial no.: _____

A) I confirm that the returned items have not been contaminated by body fluids, toxic, carcinogenic or radioactive materials or any other hazardous materials.

B) I confirm that the returned items have been decontaminated and can be handled without exposing the personnel to health hazards.

Materials used in the unit: Chemicals +   Biological •   Radioactive *)

Specific information on contaminants: _____

_____

Decontamination procedure[1]: _____

_____

Date and place: _____

Signature: _____

Name (block capitals): _____

*) The signature of a Radiation Safety Officer is also required when the unit has been used with radioactive materials.

This unit is certified by the undersigned to be free of radioactive contamination.

Date and place: _____

Signature: _____

Name (block capitals): _____

PHOTOCOPIABLE

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[1] Please include decontaminating solution used.

Certificate of Decontamination

Glossary

decontamination Removal or neutralization of radiologic, bacteriological, chemical or other contamination.

disinfection The destruction of pathogenic bacteria, usually with an antiseptic chemical or disinfectant.

EIA Enzyme immunoassay. An immunoassay using a color-changing enzyme-substrate system for indicating results. A diagnostic test method to measure or detect a substance using antibody-antigen reactions.

ELISA Abbreviation for enzyme-linked immunosorbent assay.

remote control Running mode allowing a remote computer to operate the washer.

wash head Interchangeable twin-strip 2 x 8-way, 2 x 12-way or 1 x blanking heads allowing either 1 x 8, 2 x 8, 1 x 12 or 2 x 12 processing. A single 1 x 16-way wash head allows processing of a 384-well plate.

USB Universal serial bus.

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