Zoom Washer

User's Manual

Zoom Washer-e-2016-10

Contents

1. Preface

1.1 Contact information

Berthold Detection Systems GmbH
Bleichstraße 56-68
D-75173 Pforzheim
Germany

Sales and Customer Support

Web: www.titertek-berthold.com
Phone: +49 (0)7231-9206-0
Fax: +49 (0)7231-9206-50
e-mail sales@titertek-berthold.com

Technical Service

Phone: +49 (0) 7231-9206-25
Fax: +49 (0)7231-9206-50
e-mail: techservice@titertek-berthold.com

1.2 Typographical Conventions

These icons appear on the instrument:

Icon	Description
	General warning Risk of danger to person or damage to equipment Caution – risk of personal injury to the operator or a safety hazard to the surrounding area.
	Caution – risk of electric shock
	This instrument bears the CE mark, based on Conformity to current legislation
	Dispose the instrument according to Directive 2002/96/EC, “on waste electrical and electronic equipment (WEEE)”

This manual uses the following icons

Icon	Description
❒	Actions are symbolized by
x) or •	Enumeration is symbolized by numbers or point symbol
	Important information
	General warning, caution, risk of danger.
	Caution – risk of electric shock
	This instrument bears the CE mark, based on Conformity to current legislation
	Dispose the instrument according to Directive 2002/96/EC, “on waste electrical and electronic equipment (WEEE)”

1.3 Reserved rights and Restriction

As part of our continual product improvement program, we reserve the right to change our products or services at any time. Information contained in this User's Guide is subject to change and does not represent a commitment by Berthold Detection Systems.

Product improvements that affect the information contained in this User's Guide will be documented in new revisions of this publication. This User's Guide supersedes all previous revisions.

A great deal of effort has gone into ensuring the information contained in this User's Guide is complete and accurate. Berthold Detection Systems assumes no liability for any errors or omissions in this document, or for any damages from the application or use of this information.

1.4 Intended Purpose

Description of Zoom and Zoom HT Washer

The **Zoom Washer** is a microplate washing system equipped with a 96 channel wash head assembly that provides washing for 96 well or 384 well microplates using an internal pump. The Zoom is available with one buffer inlet, and as versions which can automatically switch between two or four inlets, to provide sequential washing with different buffers.

The wash liquid is delivered to the wells by an internal pump and aspirated from the wells by an external Pump/Trap Discharge System using a vacuum pump.

In addition to the Zoom Washer capabilities the **Zoom HT Washer** model is equipped with a built-in microplate-handling device (stacker) that will automatically feed up to 30 standard size microplates for processing when turned on. When the stacker is turned off, the system will operate in manual mode: Presenting the carriage for loading and unloading of microplates and prompting the user before running a cycle.

An optional reagent **Dispense Module** can be paired with the Zoom or the Zoom HT Washer for dispensing up to two reagents, making it a useful tool in life sciences applications

Illustration 1.0: Zoom Washer

Illustration 1.1: Zoom HT Washer with built-in stacker

Illustration 1.2: Zoom HT Washer paired with optional reagent Dispense Module

Intended Purpose

The exceptional flexibility of the Zoom / Zoom HT Washer makes it an ideal tool for applications such as:

Microplate coating (Zoom HT)

Life Science Applications, e.g. ELISA processing or Cell based assays

Constraints

Zoom and Zoom HT Washers must not be used for in-vitro diagnostic.

1.5 Certifications

Zoom Units bear the CE Mark, based on conformity to the following EU Directives.

2006/96/EC – Low Voltage Directive.

2004/108/EEC – EMC Directive (Product Family Standard for Electrical Equipment for Measurement, Control, and Laboratory Use – EMC Requirements.)

2002/96/EC Waste electrical and Electronic Equipment (WEEE)

2011/65/EU ROHS

EN61010-1: 2001 – Safety Directive (Safety requirements for Electronic Equipment for Measurement, Control, and Laboratory use.)

These units comply with EMC Requirement EN61326-1 2006 and Safety Standard EN61010-1 2001.

1.6 Safety instructions and important information

Please adhere to the following information, cautions and warnings before and during operation of the instrument or placing the instrument into service:

1. **Information – Manufacturer guarantee:** The instruments have been tested by the manufacturer and are supplied in a condition that allows safe and reliable operation. The manufacturer guarantees safe operation of the equipment, both electrically and mechanically, if the user follows the instructions set forth in this manual. When it is correctly installed, operated and maintained there are no hazards present to the user of this instrument.
2. **Caution – Modification:** Modification of this equipment is not allowed. However, if the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be compromised.

3. **Caution – Distributor:** The person responsible for bringing the instrument to market has to assure that the safety instructions and precautions in this manual are communicated to the user.
4. **Caution – Personnel:** Only qualified, trained personnel may operate the instrument.
5. **Information – Accompanying documents:** It is strongly recommended that all users read this manual and the accompanying documents prior to use. These documents include information and warnings that have to be observed by the user to ensure safe operation of the instrument.
6. **Caution – Local legislation:** It is the operator's responsibility to adhere to regulations on the installation and/or operation of liquid handling systems that are required by local legislation in the country of its installation.
7. **Caution – Installation:** The instruments should be setup and mounted by a trained and authorized service technician. If this is impossible or undesirable, the user must ensure that the instruments are set up and installed in such a way that their function is not impaired. Please refer to the installation description.
8. **Caution – Accessories:** Only accessories supplied with the instrument or delivered by Berthold Detection Systems for work with this instrument may be used for operation.
9. **Warning - Electrical Grounding:** This instrument has a power cord with a three-prong plug that is required to ground metal parts. It is the responsibility of the user to connect it to a properly grounded electrical outlet. Seek professional assistance before using an adapter or extension cord; these devices could interrupt the grounding circuit.
10. **Warning – Power Rating:** The power supply must be connected to a wall outlet complying with local regulations of the country of its installation and providing voltage and current according to the specified rating for the system. Use of incompatible power receptacle may provide electrical shock and fire hazards.

    Do not connect the power cord near liquids to avoid electric shock and burning. The power cord must never become wet!
11. **Warning – Internal voltage:** The instrument is safe to operate with the covers fitted and these must not be removed during operation. Observe the warnings on the data plate and the interior labels if any covers are to be removed. Exposed connections or interior wiring may carry line voltage and high voltage DC. The covers protect the user from live parts and they should only be removed after switching the instrument off and disconnecting from the external power source.

12. **Caution – Handling: Berthold Detection Systems** assumes no liability for any damages, including those to third parties, caused by improper installation, use or handling of the device. The instruments are live and improper handling may cause damage.
    If you think that the instrument has become unsafe to use, switch it off and disconnect it from the power supply.
13. **Caution – Intended Purpose:** The instrument may only be used for the designated application. Please refer to the Intended Purpose Statement and the Constraints.
14. **Caution – Plate Transport:** The plate transport on the Zoom Washer is a free-moving mechanical device controlled by the instrument and not directly by the operator. It was designed for “hands-off” operation and should be used as such. Never reach into the workspace while the Zoom is performing a plate transfer. Ensure the plate transport path is free of obstructions.
15. **Caution - Lifter motors:** Heed the warnings on the stacker. Keep fingers clear of the lifter motor area. Disconnect the instrument from the external power source before working near the lifter motor area.
16. **Caution – Magazines:** Exercise caution when inserting or removing any loaded magazine. Because of the weight involved when they are fully loaded, you might require assistance.
17. **Caution – Potential (bio) chemical hazard:** Some assays, assay components or specimen may pose a biohazard, a risk for infection or other kinds of danger for the user. Always refer to the assay`s product insert for adequate safety precautions and recommendations for assay performance and temperature range. Wear appropriate protective equipment such as laboratory coats or chemically resistant rubber gloves and act carefully to avoid chemical burn, contamination and potential infection. Avoid spilling liquids on the instrument and decontaminate the surfaces in cases of biohazard spilled liquids.
18. **Warning – Liquids:** Avoid spilling liquids on the instrument. Wipe up all spills immediately. If liquid gets inside the instrument, disconnect the power cord immediately. Do not operate the instrument if internal components have been exposed to liquids, since they create a potential for electric shock and burning. Have the instrument cleaned by an authorized service center.
19. **Caution – Pump Functionality:** Never flush the Zoom Washer liquid pathway with municipal tap water or spring water. Use distilled water when performing a water flush on the Zoom. Failure to adhere to this caution can result in compromised dispensing precision or permanent pump failure.
20. **Caution – Maintenance:** The user may only perform the maintenance work described in this manual. See chapter Maintenance for details.

21. **Caution – Decontamination:** The instrument must be decontaminated before repair work or service to avoid contact of the service personnel with potential biohazard material.
22. **Caution – Sodium Hypochlorite:** Do not expose any part of the Zoom to, or keep the liquid pathways filled with Sodium Hypochlorite solution (bleach) for more than 30 minutes. Prolonged contact may damage the instrument. Be certain to flush the Zoom liquid pathway, and thoroughly wipe all surfaces with distilled water after using Sodium Hypochlorite.
23. **Caution – Regular Safety Inspection:** It is advisable to have this product inspected on a regular basis for worker safety and to ensure that the instrument continues to function correctly. Regulatory guidelines for your area must be observed. Contact our Service Department for information regarding on-site inspection.
24. **Caution – Service:** There are no user serviceable parts inside the instrument. Service to this instrument should only be performed by authorized service personnel. For servicing use only parts qualified by Berthold Detection Systems. Always disconnect the power cord before opening the instrument. Before continued use, reassemble and check the instrument according to instructions in the service manual.

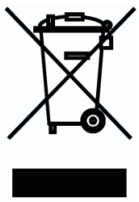
Quality control

To ensure proper operation of the system, it is recommended to operate Qualification Procedures at defined time intervals and to use high quality equipment. Use the preset performance check programs No. 90-92 together with the 96-well test plate supplied with the washer. Additionally Berthold Detection Systems offers an IQ/OQ/PQ Qualification Package. **A failure in the performance of quality control checks could result in erroneous test data.**

Return shipment

If the instrument has to be returned to Berthold Detection Systems for servicing or inspection, we recommend that you use the original packing. Using other forms of commercially available packing material is not recommended and doing so will void the instrument warranty. Always decontaminate the instrument according to the description in the decontamination form in chapter 11. Fill out this decontamination form before return shipment. Berthold Detection Systems will not accept instruments without filled out decontamination forms.

Disposal



Decontaminate the instrument before disposal! The Zoom contains electronic parts. To prevent environmental pollution please dispose of the instrument and the corresponding accessories according to local legislation. Within the EC dispose of the instrument and accessories according to the directive 2002/96/EC or contact our local representative.

Disposal of potential biohazard and chemical waste

Please dispose chemical or potential biohazard waste carefully and according to local legislation. It is recommended to treat potential biohazard waste by autoclaving.

2. Hardware Setup

This manual is a combined manual for all Zoom Washer models. The term **Zoom Washer** is used for both Zoom and Zoom HT Washer (unless otherwise indicated).

It is strongly recommended that all Zoom Washer models, the Pump/Trap Discharge System and the optional Dispenser Module are installed by a trained and authorized Service Technician. The System is complex and fails in installation may cause impaired functionality.

Zoom Installation Checklist

	2.1 Unpack the Zoom Washer
❒	Inspect the shipping package for any possible transport damage.
❒	Prepare an area and surface for Zoom installation and setup.
❒	Carefully unpack the Zoom Washer and its accessories.
❒	Ensure all items are removed from the packing material.
❒	Keep the original packaging and packing material for future transportation.
	2.2 Install the Zoom Washer Pump/Trap Discharge System
	-Use the already prepared hoses provided in labeled bags-
❒	Install the hose FOR DRAIN at the port “DRAIN” and set up the waste container.
❒	Connect the 96-Channel Aspirate Head to the Trap port “TO ASPIRATE HEAD” using the vacuum hose labeled TRAP TO ASPIRATE HEAD.
❒	Ensure the vacuum hose connection to the 96-Channel Aspirate Head has slack.
❒	Connect the Vacuum Pump outlet to the Trap port “TO FILTERCONNECTION”, using the pre-assembled parts labeled TRAP TO VACUUM REGULATOR (→Filter→VACUUM PUMP)
❒	Make a connection between the Vacuum Pump Controller port “TO TRAP” and the side inlet “TO PERISTALTIC PUMP” of the Trap, using the hose labeled PERISTALTIC PUMP TO TRAP SIDE PORT.
❒	Connect the hose labeled PERISTALTIC PUMP TO WASTE to the Vacuum Pump Controller port “To Waste Container”.

❒	Compare the completed Pump/Trap Discharge System installation to Illustration 2.1.
	2.3 Install the Zoom Washer's power and communication cables
❒	Connect the +24V DC POWER ADAPTOR with the port labeled "POWER +24V DC" on the rear on the washer.
❒	Plug the POWER CORD of the +24V DC Power Adaptor into the +24V DC Power Adaptor.
❒	Connect the EXTERNAL VACUUM CONTROL CABLE with the "VACUUM PUMP CONTROL" labeled port on the rear panel of the washer and connect the other end of the cable with the "Vacuum Pump Control" labeled port of the Vacuum Pump Controller.
❒	Plug the VACUUM PUMP'S POWER CORD into the Vacuum Pump Controller port labeled "VACUUM PUMP 230V~" (or 115V~).
❒	Connect POWER CORD to the Vacuum Pump Controller and plug into its own power receptacle.
❒	Plug power cord of the +24V DC Power adaptor into a power outlet .
❒	Connect POWER CORD to the Zoom Washer and plug into a power outlet.
	2.4 Complete the Zoom Washer installation
❒	Connect the hoses FOR WASH FLUID to the ports labeled "WASH FLUID" on back of the Zoom Washer. Place the other end into a wash fluid reservoir.
❒	Power on the Zoom Washer.
	2.5 Optional Dispense Module installation
❒	Position the Dispense Module.
❒	Use cable #51151 to link the "AUX PORT" on the rear of the Dispense Module with the port labeled "TITERTEK ACCESSORIES" on the rear panel of the Zoom Washer.
❒	Connect the POWER CORD to the Dispense Module and plug into a power receptacle.
❒	Power on the Dispense Module.

2.1 Unpack the Zoom Washer

- **Inspect the shipping package for any possible transport damage**. If the crate has been damaged in transit, it is particularly important that you retain it for inspection by the carrier in case there has also been damage to the instrument.

  Neither the manufacturer nor its agents can be held responsible for any damage incurred in transit, but the manufacturer will make every effort to help obtain restitution from the carrier. Upon receipt of the carrier's inspection report, arrangements will be made for repair or replacement.

- **Prepare an area and surface for Zoom installation and setup.** The Zoom Washer must be placed onto a solid, flat level surface. Use a spirit level to ensure the surface is level.

- **Carefully unpack the Zoom Washer and its accessories**. Ensure the arrows on the shipping crate are pointing upwards while removing the side and front.

- **Ensure all items are removed from the packing material**. Contact Berthold Detection Systems or your local representative if any parts are damaged or missing.

- **Keep the original packaging and packing material for future transportation.**

2.2 Install the System

Installation Overview for Zoom Washer (recommendation):

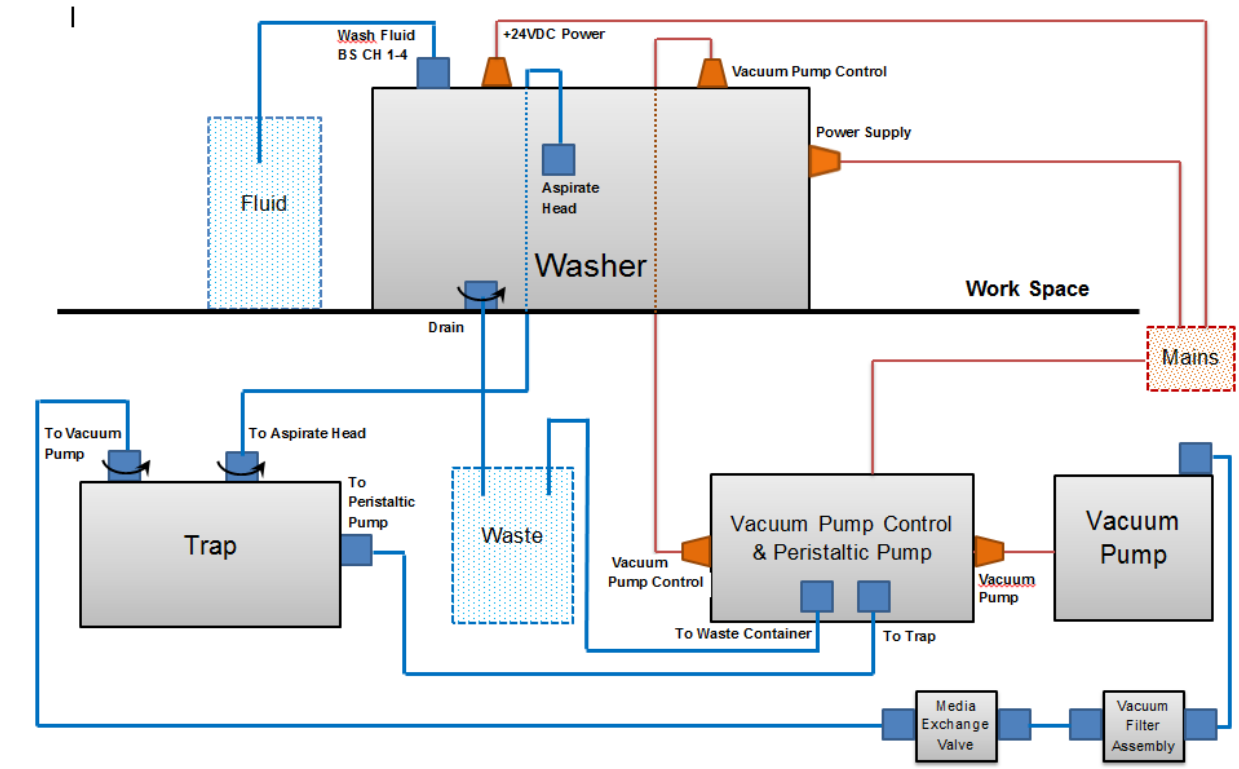


Illustration 2.1: Overview

Setup and installation of the system:

- ❑ The washer must be setup on a level work space. Trap, Vacuum Pump Control with Peristaltic Pump and Vacuum Pump may be placed on the same level or below the work space. Due to space restrictions it is recommended to place them below the workspace as shown in the overview. The Waste Container must always be placed below the work space.

Use the already prepared hoses and cables provided in labeled bags for installation. Connect all parts according to the overview scheme.

- ❑ **Install the drain hose and set up the waste container**. Run the drain hose to a waste container located below the washer.

  The drain hose must be placed above the liquid level in the waste container and must be straight. Failure to do this will overflow the drain during a priming to drain operation**.**

- ❑ **Connect the 96-Channel Aspirate Head to the Trap with the vacuum hose.** insert the end of the hose without the bulkhead connector into the top of the 96-Channel Aspirate Head and the other end to the Trap port labeled “To Aspirate head”.

- ❑ **Ensure the vacuum tubing connection to the 96-Channel Aspirate Head has slack.** A configuration consisting of two cable ties and an adhered cable guide on the back side of the washer assist in securing a proper amount of vacuum hose slack for free movement of the 96-Channel Aspirate Head. See Illustration 2.5.

Illustration 2.2:
The proper amount of vacuum tubing slack provided for free movement of the 96-Channel Aspirate Head during aspiration function.

Failure to provide vacuum hose slack to the 96-Channel Aspirate Head will result in restricted movement, incomplete microplate aspiration, and/or damage to the washer.

- ❑ **Connect the Vacuum Filter Assembly and the Media Exchange Valve to the respective Trap** port.
- ❑ **Make a connection between the Vacuum Pump Controller ("to Trap") and the side inlet of the Trap ("To peristaltic pump")** using the hose labeled "Peristaltic pump to trap side port".
- ❑ **Connect the 6ft hose labeled "Peristaltic pump to waste" to the Vacuum Pump Controller ("to Waste container")** and insert the other end into the waste container

The waste liquid flow from the Vacuum Pump Controller to the waste container is driven by a peristaltic pump thus avoiding liquid becoming trapped in the hose.

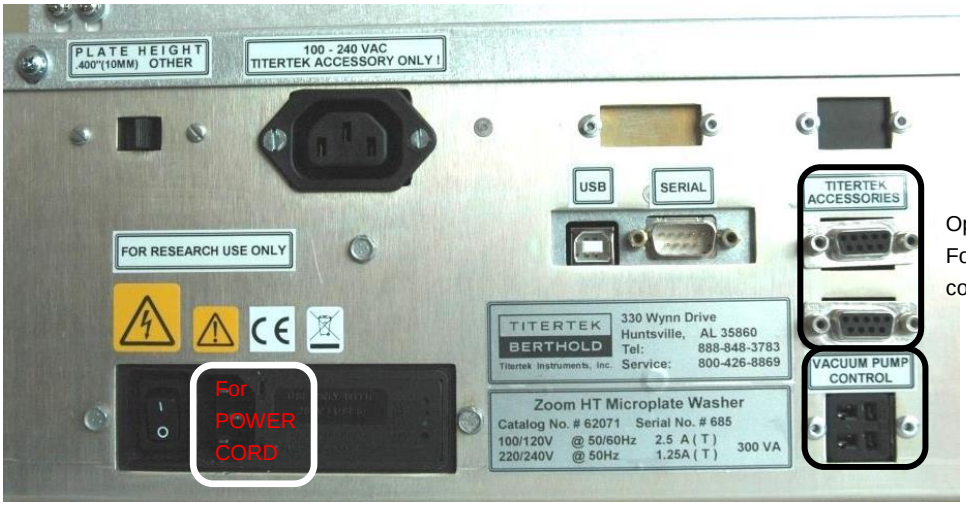
- ❑ **Compare the completed Pump/Trap Discharge System installation to Illustration Overview**
- ❑ Install the "Bleach or antifoam inlet tubing for trap" only if necessary.

2.3 Install the power and communication cables

See Illustration 2.3 and 2.4 below for connection of power and communication cables

Illustration 2.3: POWER +24V DC port

- ❑ **Connect the +24V DC Power adaptor with the port labeled POWER +24V DC.**
- ❑ **Plug the power cord of the +24V DC Power Adaptor into the Power Adaptor.**



Optional:
For DISPENSER connection

Illustration 2.4: Cable connection ports on Zoom HT rear panel (respective ports are also available on the Zoom washer rear panel)

- ❑ **Connect the EXTERNAL VACUUM CONTROL CABLE to the "VACUUM PUMP CONTROL" labeled port on the rear panel of the washer and connect the other end of the cable with the "VACUUM PUMP CONTROL" labeled port of the Vacuum Pump Controller.**
- ❑ **Plug the VACUUM PUMP'S POWER CORD into the Vacuum Pump Controller port labeled "VACUUM PUMP 230V~" (or 115V~).**
- ❑ **Connect POWER CORD to the Vacuum Pump Controller and plug into its own power receptacle.**

Caution! Do not plug the Vacuum Pump Controller into a multiple socket to avoid electrical overloading. The Vacuum Pump Controller must be plugged into its own AC receptacle.

- ❑ **Plug POWER CORD of the +24 V DC POWER ADAPTOR into a power outlet.**
- ❑ **Connect POWER CORD to the Zoom Washer and plug into a power outlet.**

2.4 Complete Buffer Selection

- ❑ The Zoom Washer may be equipped with up to 4 ports for wash fluids (BS-1/2/3/4). **Connect the hoses to the ports labeled "WASH FLUID" on back of the Zoom Washer. Place the other end into a wash fluid reservoir.**

Cavitation: To prevent cavitation of liquids during pump filling, the tubing that descends into the reagent container should be cut at an angle.

Illustration 2.5: Buffer Selection (BS-4)

- ❑ **Power on the Zoom Washer.** The power switch is located on the rear of the Zoom Washer. The Zoom washer is now ready for use.
- ❑ See the next section for using the Zoom Washer, or continue with hardware setup if a Dispense Module will be installed.

2.5 Dispense Module installation

- ❑ **Position the Dispense Module.** If you are using the Zoom Washer position the Dispense Module as pictured in illustration 2.6. If you are using the Zoom HT Washer with the built-in microplate stacker position the Dispense Module behind the microplate magazines on top of the Zoom HT Washer.

Illustration 2.6:
Zoom Washer with Dispense Module

- ❑ **Use cable #51151 to link the "AUX PORT" on the rear of the Dispense Module with the port labeled "TITERTEK ACCESSORIES" on the rear panel of the Zoom Washer.** Select any of the two available Titertek Accessories ports to complete the connection. Ensure the cable's connector pins are flush with the connection port and that each of the cable's heads are secured and/or tightened with the flat head screws. See Illustration 2.4.
- ❑ **Connect the POWER CORD to the Dispense Module and plug into a power receptacle.**
- ❑ **Power on the Dispense Module.** Do this by flipping the power switch on the side of the Dispense Module to the on position.

The Dispense Module must be powered on before the Zoom Washer is powered on. If the Dispense Module has been installed but will not be used, power it off.

After the Dispense Module and the Zoom Washer have been powered on in the correct sequence, the Zoom Washer will display the main menu. See Illustration 2.7.

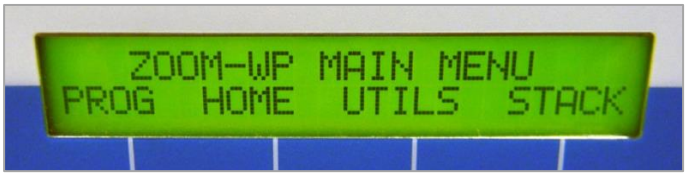


Illustration 2.7:
Zoom Washer main menu

- ❑ 10ml syringes are shipped with Valve/Syringes pre-installed. **Attach tubing to the 10 ml syringes**. Pre-bent tubing (#51629) and pre-formed elbows (#51773) are provided with the Dispense Module accessories. If necessary, cut the tubing.
- ❑ Insert the tapered end of the provided tubing expanding tool (#25870) into one end of this tubing

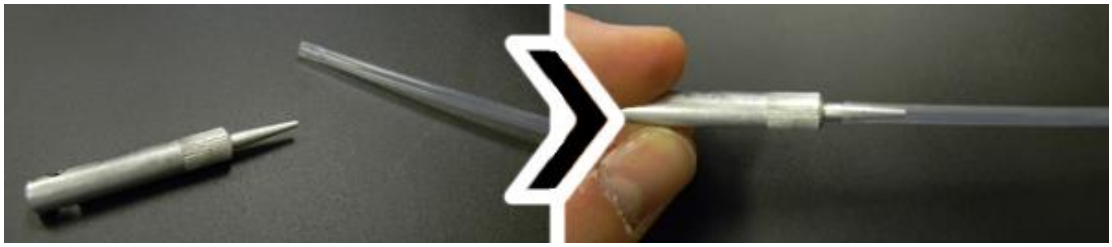


Illustration 2.8: Using the tubing expander tool.

- ❑ Attach this end to Port 1 of the syringe valve. See illustration 2.9 below for proper port identification.

Port 1 on both valves point outside.
Port 2 on both valves point forward.
Port 3 on both valves point inside.

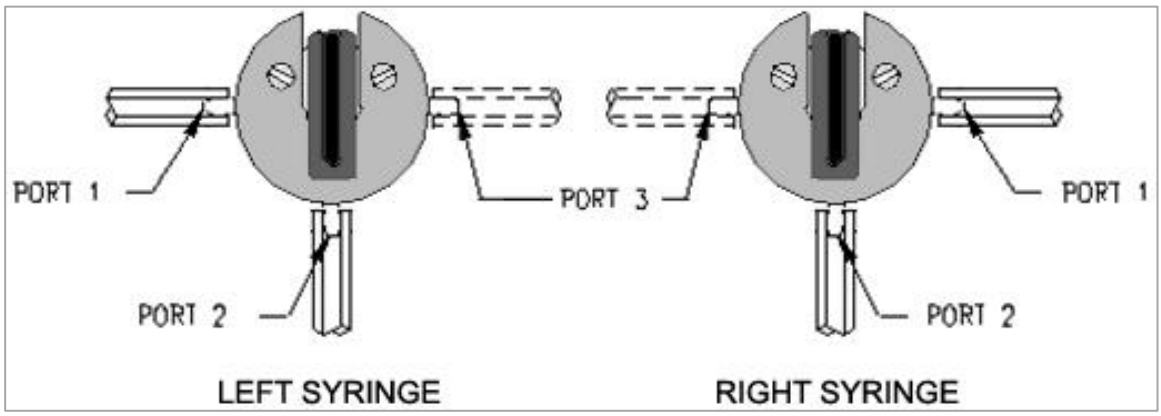


Illustration 2.9: 3-port valves

It is especially important to expand the tubing with the tubing expander tool before attempting to attach it to the valve ports. Failure to take this precaution can result in port breakage.

It helps to use a small piece of sand paper or Parafilm to grip the Teflon tubing as it is placed over the valve's port, or to wear lab gloves. See illustration 2.21 below.

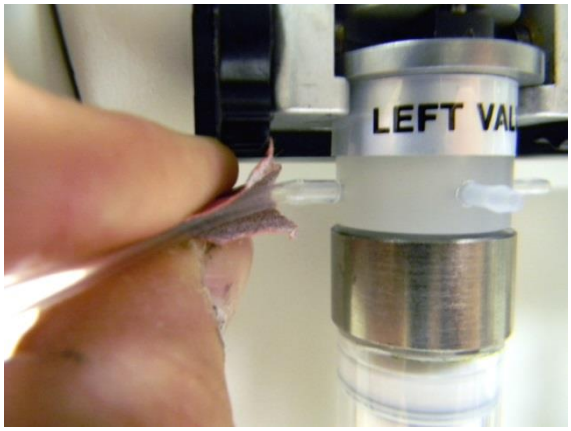


Illustration 2.10:
Inserting inlet tubing onto port 1 of the LEFT syringe valve while using a small piece of sandpaper to help grip the tubing. Wearing lab gloves will also work.

- ❑ Cut an angle on the end of the tubing that will be placed into the reagent reservoir.

Illustration 2.11:
Angled cut inlet tubing to be placed in reagent reservoir.

Cavitation: To prevent cavitation of liquids during syringe filling, the inlet tubing that descends into the reagent container should be cut at an angle. See Illustration 2.11 above.

- ❑ Pre-formed elbows are provided to help direct the tubing to the desired position. The tubing is simply slipped inside the elbow. See illustration 2.12.

Illustration 2.12:
Pre-formed elbows for directing tubing.

For the greatest dispensing precision, set the reservoirs of liquid as close to the unit as possible, preferably at a height equal to the Dispense Module's syringe.

- ❑ Install the Dispensing Manifolds using the provided Allen key. Insert your microplate, press:

  EDIT → **PROF** →**AUX** → **10ml**

  and adjust the manifolds manually.

- ❑ In the next step take pre-bent tubing and make a connection between Syringe port 2 and its dispensing manifold.

- ❑ The Syringes are labelled. Syringe 1 is the right and Syringe 2 is the left Syringe.

  Syringe 1 corresponds to the RIGHT-SIDE manifold.
  Syringe 2 corresponds to the LEFT-SIDE manifold.

2.6 Loading / Unloading Microplate Magazines (Zoom HT)

If you are using the Zoom HT Washer with built-in stacker, you may insert a magazine loaded with microplates into the stacker after the unit has been powered on.

It is highly recommended to insert *loaded* magazines into the stacker only after the unit has been powered on to prevent possible plate dropping upon power up.

- ❑ To load a magazine, stack the microplates on a work surface with two extra plates at the bottom of the stack. (see Illustration 2.13 A)

- ❑ Take care to orient the plates in the same direction with well A1 positioned so that it is in the left rear corner of the magazine. Carefully lower the empty magazine over the stack of plates. The magazine will latch to the stack of plates as the magazine is lifted.

The magazine's latch mechanism will not pick up the first and second plate of a stack.

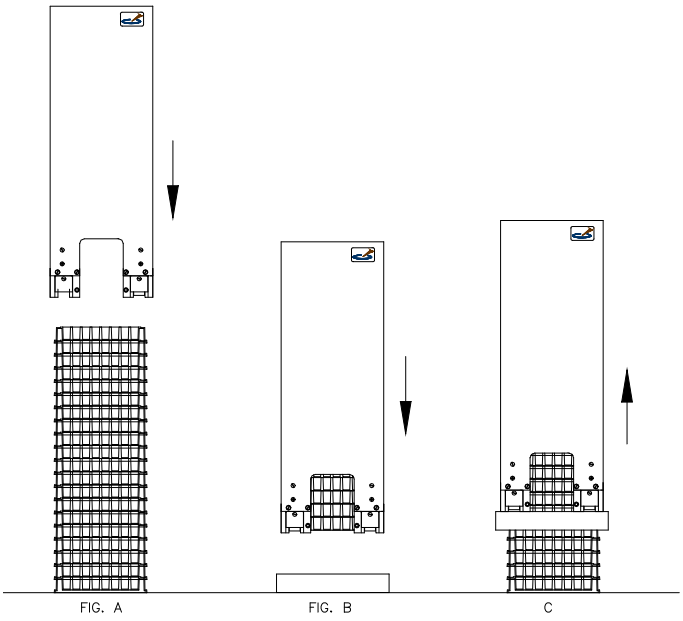


Illustration 2.13: Inserting (A) and Unloading (B, C) Magazine Microplates.

- To release the microplates from the magazine, put the plate release adapter on a clean work surface over a microplate. Next, insert the loaded magazine into the release adapter on top of this microplate. The magazine should *click,* indicating the latch mechanism has been disengaged. Finally, lift the magazine up using the plate release adapter handles. See Illustration 2.13 B and C, and Illustration 2.14.

Exercise caution when inserting or removing loaded magazines. Assistance may be required to prevent a tower of microplates from toppling or well contents from splashing. An alternative would be to partially unload the magazine by using the stack or restack commands.

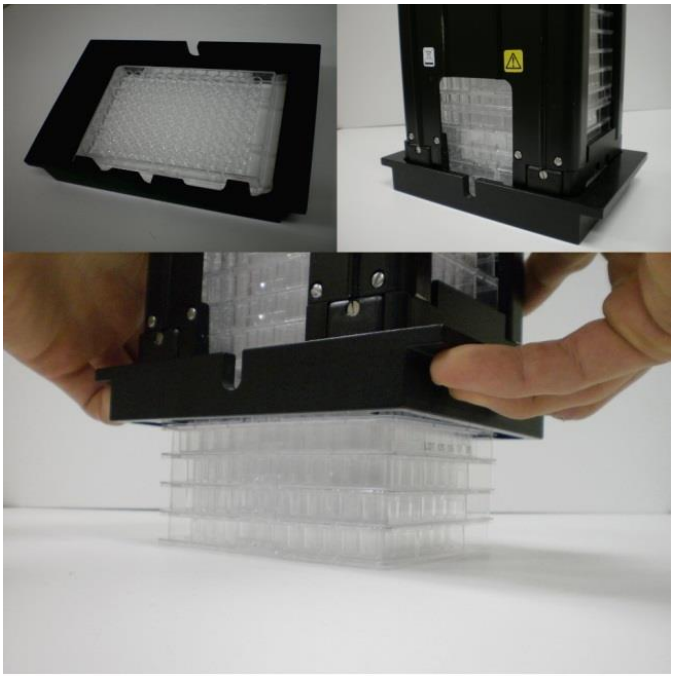


Illustration 2.14: Using the plate release adapter.

- The Plate Height Selector Switch is mounted on the rear panel of the stacker. (Refer to Illustration 2.15). Normally the Selector Switch is set to the “Other” position. If you wish to process “thin plates” (plate height 10 mm) set the switch to .400 (10 mm position)

Illustration 2.15: Plate Height Selector Switch

3. Using the Zoom Washer

3.1 Operating conditions

Operating temperature: +10°C to 40°C / 50°F to 104°F
System performance may be adversely affected if temperatures fluctuate above or below this range. Storage temperature limits are broader.

Please refer to the safety instructions and important information in chapter 1.6 before getting started!

3.2 Getting started

- ❑ Switch on the Zoom washer. It first displays the **software version** and then automatically switches to the **MAIN MENU**.
- ❑ To review the software version installed on your Zoom Washer, press the soft-key **EXIT** while the **MAIN MENU** is displayed.

3.2.1 Keypad operation

The Zoom Washer is controlled via **soft-keys**. Soft-keys are used for:

- Numerical entries
- Profiling of plate carriage and aspirate head → see Zoom Washer Profile Guide in chapter 4.2
- Menu item selction: by pressing the soft key numeral underneath the corresponding option.

Please note:

- For clarity we simplified the commands for item selection in this manual in the following way (example):

Press soft-key 1 underneath PROG → Press PROG

- During program editing, **stored parameter values** are indicated by brackets: **<VALUE>.**
- Pressing the **ENTER** key will select the stored value. This allows necessary program changes to be made quickly.
- Pressing **EXIT** will leave the menu without changes.

3.2.2 Menu navigation

The Zoom Washer's **MAIN MENU** contains four options:

ZOOM MAIN MENU			
PROG	**HOME**	**UTILS**	**STACK**

PROGRAM MENU:

Pressing **PROG** will display the following **PROGRAM MENU**:

PROGRAM			
RUN	**LIST**	**EDIT**	**MORE**

RUN: run any stored programs
LIST: identifies a program's function and parameters
EDIT: create and edit programs
MORE: manage stored programs

When **MORE** is selected the following menu options become available:

COPY: duplicate a stored program by copying it into another program number
DELETE: delete a stored program

HOME:

HOME will return the Zoom Washer's motors to their reference positions. This option is only used when the plate carriage or aspirate head have been manually moved.

UTILITY MENU

UTILS opens the **UTILITY MENU**: The utility menu contains the **INSYR** function, which allows the user to remove/replace syringes on a Dispense Module.

STACKER MENU (Zoom HT only)

The following menu options **only** become available if you are using the **Zoom HT** Washer, which has a built-in microplate stacker.

STK=ON/OFF: indicates the stacker is activated / inactivated.

RESTK: moves plates from the **left** microplate magazine to the **right** microplate magazine. (output magazine → input magazine)

STACK: moves plates from the **right** magazine to the **left** magazine. (input magazine → output magazine)

When the stacker is **OFF**, the user will be prompted to load a microplate into the carriage by hand. Turning the stacker **OFF** can cause some of your created programs to no longer work.

4. Set up Single Programs

4.1 General information

The Zoom Washer can store 99 programs.

The Zoom washer is delivered with a number of **preset programs (No.1-6 and 90-92)** which are especially useful for a quick start and performance testing after installation. The protocols and their settings are listed in the chapter Technical Data.

Do not use these program numbers for your individual programs!

Do not change these programs! They are not permanently stored and parameters can be overwritten.

Profile parameter

Every washer program contains information about the plate type and plate specific parameters for Aspiration, Dispense, Supervac and Superwash functions. These profile parameters are set, changed and stored in the submenu **PLATE** and **PROF** of a program. Dispense Module Manifold Profiling parameters are set, changed and stored independently from a special protocol in the submenu **AUX-D**.

Process parameter

Additionally assay specific process parameters for prime, wash or dispense can be stored in a program. These process parameters are set and changed in the submenu **COMMAND** of a program.

Programs may be defined for single actions, as described in this chapter.

Linking cycles within programs or linking programs allows combining several functions in complex programs.

Linking cycles within a program allows you to do multiple processing steps to one plate before moving onto each successive plate in a plate series.➔ See chapter 5

Linking programs allows you to run a program on all your plates before running another program starting from the first plate in the series again. ➔See chapter 6

Create a system of records that will allow you to easily identify programs stored in your washer.

4.2 Profile programs

In order to ensure the best performance during the wash, the position of the plate carriage and aspirate head must be set and stored in a program as a plate profile for every new 96 well or 384 well microplate type. Profile parameters are set or changed in the submenu **PLATE** and **PROF** of a program.

The profile accommodates variation in a well's geometry and may be set to reflect specifics of the assay.

Creating programs that have only profile information stored in them can serve as templates for future programs. This allows you to copy these "template" microplate profile programs into new, blank programs so you do not have to set plate profile information for every new wash program you create in the future.

4.2.1 96 well plate profiling

Follow the below instructions to set the plate profile parameters to your requirements:

- ❑ Starting from the **MAIN MENU** press

  PROG → **EDIT** → **SELECT PROGRAM NUMBER** → **ENTER**

  PLATE → **96** →

  PROF → **ASP**

- ❑ Load your microplate and **hit any key** to continue with the Aspirate tubes positioning settings **(ASP).**
- ❑ Adjustment is done using the soft-keys. For details on using soft-keys refer to the Zoom Washer Profile Guide in chapter 10.3.

Adjustment of the aspirate tubes positioning settings (ASP):

The following procedure adjusts vertical (Z-axis) and horizontal (X and Y axis) positioning of aspirate tubes to achieve the desired residual volume.

ASPIRATE (X, Y, Z) PROFILE
X=000 Y=000 Z=000:000

- ❑ For **coarse vertical adjustment in 5 step increments** press

  soft-key **9** repeatedly until aspirate tubes are lowered sufficiently (Z=090:000 is suitable for most plates.).

  Soft-key **1** moves the aspirate tubes 5 steps up.

- ❑ For **fine vertical adjustment in 1-step increments** press

  soft-key **4** to move aspirate tubes one-step up

  soft-key **8** to move aspirate tubes one step down

- ❑ Ensure that the aspirate tubes do not touch the bottom but are sufficiently down.

- ❑ For **fine front to back (Y-axis) and left to right (X-axis) adjustments** press soft-key **5** to move plate left and

  soft-key **7** to move plate right for X-axis adjustments and

  soft-key **0** to move aspirate head away and

  soft-key **2** to move aspirate head forward for Y-axis adjustments.

- ❑ Ensure that the tubes are centered in both X- and Y-directions.

- ❑ Press **Enter** → **SAVE PROFILE** → **HIT ANY KEY** and exit the **ASP** function.

Please Note: After re-selection of the aspirate settings the Z-axis value will be reset to 10.

Adjustment of the SUPERVAC function (SVAC)

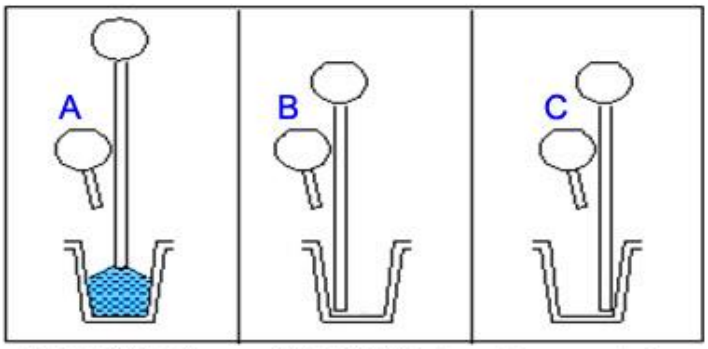
- ❑ Press **SVAC** in the submenu **PROF** and use the soft-keys for adjustment of the SUPERVAC JOG distance.

- ❑ For **Y-axis adjustments** press soft-key **2** and soft-key **0.**

- ❑ For **X-axis adjustments** press soft-key **5** and soft-key **7**.

(For maximum coverage set to x=09 and y=09)

Please Note: When setting **SVAC** the microplate will not be presented underneath the aspirate head. X and Y numeral values correspond to step increments. Y needs about 200% of X for the same movement.



SUPERVAC: A normal ASPIRATE element is executed (A) but, prior to moving the aspirate tubes up out of the wells, the carriage moves the plate side to side (by the SUPERVAC JOG distance) to allow aspiration from the "sides" (B and C).

Illustration 4.1: Description of SUPERVAC

- ❑ Save the function settings and return to the **MAIN MENU** with **ENTER** and **EXIT**.

The Superwash Function (SWASH) and Dispense Function (DISP) usually need no adjustment. Factory settings can be used.

4.2.2 384 well plate profiling

Follow the below instructions to set the plate parameters to your requirements:

- ❑ Starting from the **MAIN MENU** press

PROG → EDIT→ PROGRAM NUMBER →ENTER

PLATE → 384→ yes →

PROF → ASP_P1

- **ASP_P1** and **ASP_O2** have to be defined in that sequence to complete the aspirate tubes positioning settings. Check **DSP_JOG** for the dispense needles (see below).
- Load your microplate and hit any key to continue

Adjustment of ASP_P1 for 384 well plates

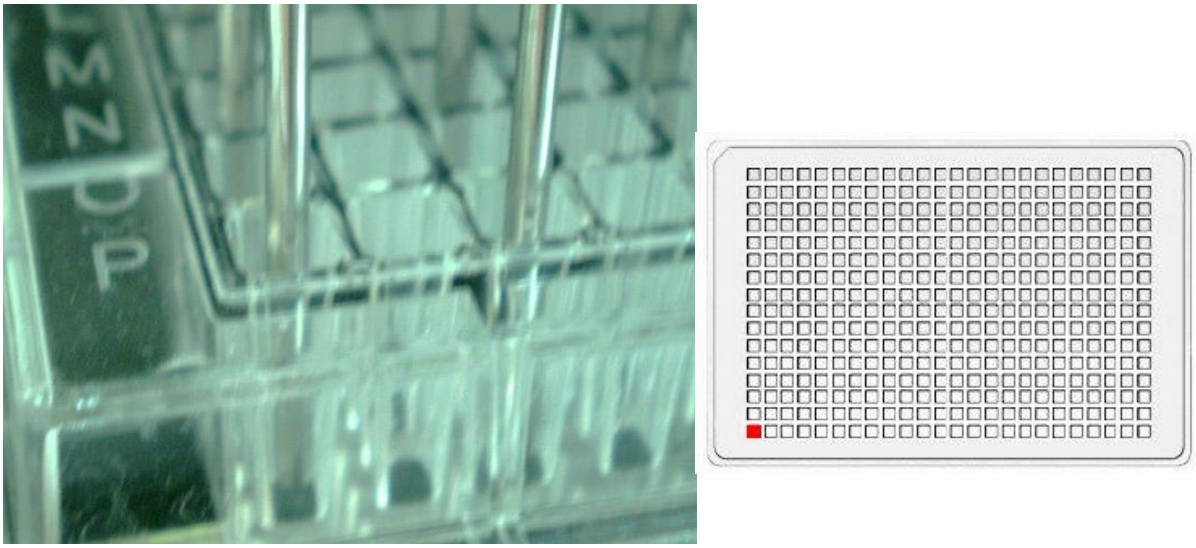


Illustration 4.2: ASP_P1 Correct Aspiration Tip Positioning in well P1

The **ASP_P1** is configured correctly when the position of the aspiration tips look as pictured in Illustration 4.2, when the last aspiration tip in column 1 of the aspiration head is sitting in the 384 well microplate's P1 well. Use the soft touch keypad instructions below to position the aspiration tips.

The following procedure adjusts vertical (Z-axis) and horizontal (X and Y axis) positioning of aspirate tubes to achieve the desired residual volume.

ASP-384-P1 (X, Y, Z) PROF
X=000 Y=000 Z=000:000

.

- ❑ For **coarse vertical adjustment in 5 step increments** press

  soft-key **9** repeatedly until aspirate tubes are lowered sufficiently (Z=090:000 is suitable for most plates.).

- ❑ For **fine vertical adjustment in 1-step increments** press

  soft-key **4** to move aspirate tubes one-step up

  soft-key **8** to move aspirate tubes one step down

- ❑ Ensure that the aspirate tubes do not touch the bottom but are sufficiently down.
- ❑ For **fine front to back (Y-axis) and left to right (X-axis) adjustments** press soft-key **5** to move plate left and

  soft-key **7** to move plate right for X-axis adjustments and

  soft-key **0** to move aspirate head away and

  soft-key **2** to move aspirate head forward for Y-axis adjustments.

- ❑ Ensure that the tubes are centered in both X- and Y-directions.
- ❑ Press **Enter**

Adjustment of ASP_O2 for 384 well plates

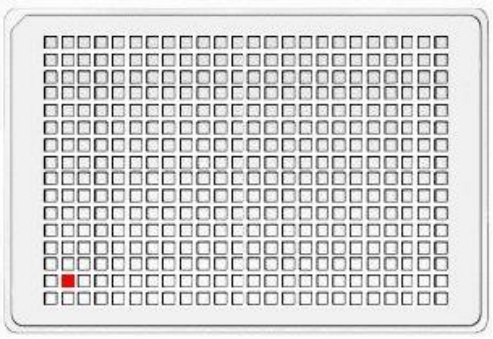


Illustration 4.3: ASP_O2 Correct Aspiration Tip Positioning in well O2

The ASP_O2 is configured correctly when the position of the last aspiration tip in column 1 of the aspiration head is sitting in the 384 well microplate's P1 well. Use the soft touch keypad instructions above to position the aspiration tips.

Please note:
It's not necessary to set the Z depth because it's saved in the P1 setting.

DSP_JOG

The **DSP_JOG** setting determines how far the dispense needles move along the X-Axis when dispensing in a 384 well plate.

It is recommended to leave this setting at its default of X=08.

If the 384 Dispense X-Jog is increased, the dispense needles will be further to the right resulting in a dispense aimed higher on well walls.

If it is decreased, the dispense will aim more toward the bottom of the wells.

Maladjustment of the 384 Dispense X-Jog will result in the dispense missing the target wells.

❑ → **SAVE PROFILE** → **HIT ANY KEY** and exit the **ASP** function.

The Superwash Function (SWASH) and Dispense Function (DISP) usually need no adjustment. Factory settings can be used.

4.2.3 Dispense Module Manifold Profiling

Profiling of Dispense Module manifolds is a manual process and the settings are not stored within the software. To setup your Dispense Module manifolds for correct dispensing use the following instructions:

❑ Starting from the **MAIN MENU** press:

PROG → **EDIT** → **SELECT PROGRAM NUMBER** → **ENTER**

(Dispense Module settings are not stored within the software, it does not matter which program number you select)

❑ Within the selected program press:

PLATE → **XXX** → **YES** →

Never change a stored microplate type! In cases of change of the microplate type the whole program with all settings will be cancelled. Press:

AUX-D

The Zoom washer will present the carriage and prompt you to load the microplate to proceed with the **Auxiliary Dispense Module manifold profiling.**

- ❑ Load your microplate and press **any key**. The Zoom washer will transport the plate underneath the manifold bracket.

Illustration 4.4: Correct Manifold Positioning for the Dispense Module

- ❑ Using a 9/64 allen wrench, manually adjust the manifolds positioning until it is set to dispense into the first column of your microplate. Ensure the manifold's tips are pointing to the left.

When profiling Dispense Module manifolds for 384 well plates, 16 way manifold must be used together with the 10ml syringes.

- Proper position for 16 way manifold 2 is above column 1.
- Proper position for 16 way manifold 1 is above column 3.

4.3 Priming programs

Adequate priming is necessary to fill the lines and to eliminate air from the liquid delivery path. Always prime the washer before running any other program. Priming is critical for accurate and repeatable results.

- ❑ To create or change a priming program starting from the **MAIN MENU** press:

  PROG → EDIT → SELECT PROGRAM NUMBER → ENTER →

- ❑ The following priming parameters are set, changed or stored within the new program XX .Press

  COMMAND→ Prime

4.3.1 Priming the washer

- ❑ Press **Pump** and follow the menu to define the following pump parameter. Confirm your input with **ENTER** if necessary.

Inlet Module Valve:	Depending on your device IM-1 to IM-4
Volume (ml):	The default volume is 50ml. Use the soft-keys for settings.
Cycles:	Minimum total priming volume is 150ml. Set no less than 3 cycles at 50ml.
Select pump speed	Pump speed FAST_to_Slow (1-7); If unsure start with speed #4
Prime to container	A priming container is supplied with the instrument and can be inserted in the plate carriage. Default is priming to drain **(<NO>)**.
Link Another Cycle	Do not link another cycle to a priming program.
Link another program	Yes / No.

- ❑ Return to the **MAIN MENU** with **ENTER** and **EXIT**

4.3.2 Priming the Dispense Module

- Press **10 ml** to select the dispense syringes and follow the menu to define the following Dispense Module parameters. **Do not select 1000µl, as this option is no longer active.** Confirm your input with **ENTER** if necessary.

Select Manifold	Select a single manifold or Man1+2
Select Volume (µl):	The default volume is 5000µl. Use the soft-keys for settings
Select Cycles:	Minimum total volume is 25ml.Set no less than 5 cycles at 5ml.
Inlet Port	Port 1 (Port 3 is disabled for all Zoom series.)
Prime Outlet Port	Port 2
Select Disp Speed	Select between Fast, Med and Slow
Prime to Container	A priming container is supplied with the instrument and can be inserted in the plate carriage. Default is priming to drain **(<NO>)**.
Link Another Cycle	Do not link another cycle
Link another program	Yes / No

4.4 Wash programs

4.4.1 Copy the microplate profile

Before adding the wash parameter it is necessary to copy your microplate profile program into the new wash program.

- ❑ To copy a microplate profile starting from the **MAIN MENU** press:

  PROG → **MORE** → **COPY** →

  SELECT PROGRAM NUMBER Enter the number of the new wash program
  SEL PROG DESTINATION NUM Enter your plate profile program number

- ❑ Return to the **Program** menu with **ENTER** and **EXIT**

4.4.2 Wash parameter

- ❑ To enter wash parameter starting from the **PROG MENU** press

  EDIT → **SELECT PROGRAM NUMBER** → **ENTER** →

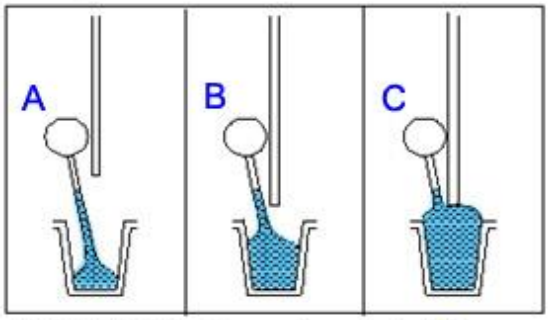
- ❑ The following wash parameter are set, changed and stored within the new program XX. Press

  COMMAND → **Wash**

- ❑ Follow the menu and define the following wash parameter. Confirm your input with **ENTER** if necessary.

Select Volume	Enter the wash volume (5-300µl) per well and cycle.
Select Cycles	Set your number of cycles.
Set Aspirate Time	Set the aspirate time. If the aspirate time is set as 0 (zero), no aspiration will occur.
Select Head Speed	The aspirate head speed determines how fast the aspirate tubes go down into the well. Select between fast, medium and slow.
Select Pump Speed	Fast_to Slow(1-7); Set the dispense speed.
Set Soak Time	Set a soak time 00 - 99s. Usually the default setting is 00.
Set Last Aspirate Time	Set the last aspirate time. If the plate must be filled with buffer after the last wash, select 0 (zero).

Super Wash Select whether the SUPER WASH function will be enabled or not. When the Super Wash parameter is set to yes, the first action the Zoom will take during a wash program is a simultaneously dispense + aspirate (aspirate from the Super Wash profile position). This is different than a normal wash program, which always begins with an aspirate before the first wash buffer dispense.



SUPERWASH: Dispensing starts (A). The aspirate tubes are positioned at the MENISCUS HEIGHT(B). The dispense "overfills" and the excess is removed through the aspirate tubes (C).

For 384 well plates: Super Wash is theoretically possible but usually impractical. Proceed with caution !

Link Another Cycle Select **Yes/ No**
Link Another Program Select **Yes/ No**
Save the program Select **Yes/ No**

- ❑ Exit to the **Program** menu.
- ❑ **Before running a wash program, run a priming program first.**

4.5 Dispense programs

As well as plate washing, the Zoom washer may be used for dispensing. The user may use the 96 well wash head or the optional Dispense Module for dispensing.

4.5.1 Copy the microplate profile

Before adding the dispense parameter it is necessary to copy your microplate profile program into the new dispense program.

- ❑ To copy a microplate profile starting from the **MAIN MENU** press:

  PROG → **MORE** → **COPY** →

SELECT PROGRAM NUMBER	Enter the number of the new dispense program
SEL PROG DESTINATION NUM	Enter your plate profile program number

- ❑ Return to the **Program** menu with **ENTER** and **EXIT**

4.5.2 Pump Dispense Parameter

- ❑ To enter dispense parameter starting from the **PROG MENU** press

  EDIT → **SELECT PROGRAM NUMBER** → **ENTER** →

- ❑ The dispense parameter are set, changed and stored within the new program XX. Press

  COMMAND → **Disp** → **Pump**

- ❑ Follow the menu and define the following dispense parameter. Confirm your input with **ENTER** if necessary.

Select Volume (µl)	Select the required volume for your microplate / well size
Select Pump Speed	Pump speed Fast_to_Slow (1-7); if unsure start with #4
Set Soak Time	Usually set to 00
Set Shake Cycles	Select your number of cycles.
Link Another Cycle	Yes / No
Save Program	Yes / No

- ❑ Return to the **MAIN MENU** with **ENTER** and **EXIT.**

- **Before running a dispense program, run a priming program for the washer first.**

4.5.3 Dispense Module Parameter

- To enter dispense parameter starting from the **PROG MENU** press

  EDIT → **SELECT PROGRAM NUMBER** → **ENTER** →

- The dispense parameter are set, changed and stored within the new program XX. Press

  COMMAND → **Disp** → **10ml**

  Do not select 1000µl, as this option is no longer active!

- Follow the menu and define the following dispense parameter. Confirm your input with **ENTER** if necessary.

Select Volume (µl)	Select the required volume for your microplate / well size
Disp Inlet Port	Select Port 1; Port 3 is disabled for all Zoom series washers.
Select Manifold	Select Man1 / Man 2 / Man 1+2 If Man1+2 are selected, both manifolds will dispense the same reagent simultaneously. This saves time by dispensing a reagent two columns per dispense.
Select Disp Speed	Select Fast / Med / Slow
Set Soak Time	Usually set to 00
Set Shake Cycles	Select your number of cycles.
Link Another Cycle	Yes / No
Save Program	Yes / No

- Return to the **MAIN MENU** with **ENTER** and **EXIT.**

- **Before running a Dispense Module program, run a priming program for the dispenser first.**

5. Linking cycles within a program

Linking cycles within a program allows you to do multiple processing steps to one plate before moving onto each successive plate in a plate series.

To link cycles, the parameter command **Link Another Cycle** within the washer or dispenser program submenu Command must be activated with **Yes.** Links are numbered in the submenu **Command** with: **Prog:XX – Link YY.** The first step in the program is named **Link 01**.

Examples for linking cycles could be:

- ❑ Prime washer followed by prime the Dispenser Module.
- ❑ Wash step followed by a dispense step with the Dispense Module.
- ❑ Dispense with Man 1 followed by dispense with Man 2.
- ❑ **Do not link wash or dispense cycles to a priming program!**

Example for program setup:

Set up a program with a wash step followed by a dispense step with the Dispense Module:

- ❑ Create a profile program for your plate (see section 4.2.1 or 4.2.2).
- ❑ Setup the Dispense Module manifolds for correct dispensing (see section 4.2.3)
- ❑ Copy your plate profile to an empty program and add wash commands into this new program (see section 4.4). The wash commands will be named **Prog:XX – Link 01.**
- ❑ The second to last command is **Link Another Cycles.** →Select **Yes.**
- ❑ The second cycle, named **Prog:XX – Link 02,** starts again at the submenu Command of your program. Select **Disp** and the syringe **10ml**. Define the dispense parameter as described in section 4.5.3
- ❑ Prime your washer and the Dispense Module before running the program.

6. Linking programs

Linking programs allows you to run a program on all your plates before running another program starting from the first plate in the series again.

To link programs, the parameter command **Link Another Program** within a program's submenu **Command** must be activated with **Yes.**

Examples for linking programs:

- ❑ Prime washer followed by a wash program
- ❑ Wash program followed by a dispense program

Please note:

Programs containing several linked cycles can be linked to another program, too.

Example for program setup:

Link a priming program to a wash program. Use existing programs or create new ones as described below:

- ❑ Create a profile program for your plate (see section 4.2)
- ❑ Copy the plate profile to an empty program, add wash parameters (see section 4.4) and store the new wash program.
- ❑ Create a priming program for the washer. Alternatively select an existing priming program, go through the submenu Command and reconfirm the parameters stored for priming as **Link 01** (see section 4.3.1).
- ❑ The last command is

Link Another Program	Select Yes
SELECT PROG TO LINK.	Insert the number of the washer program to be linked. →Prog-link:XX,

- ❑ Save the program and exit.

7. Administrative Lock Feature for Zoom HT

The administrative lock feature protects programs from unauthorized changes. It is available in Zoom HT firmware V6.0 and higher.

In order to ensure that the created programs are secured against accidental or unauthorized changes, the Zoom offers the option to protect the programs through a global pin code.

I.e. it will then require the user to enter a pin code to access the menu items for creating, editing, copying and deleting programs.

Please note: The first entered digit will be the left-most number of the pin. If a fifth digit is entered, the previous entered four digits will be removed and it is possible to retype the pin from the beginning.

7.1 Enabling administrative lock

Follow the instructions below to enable the administrative lock.

- ❑ Starting from the Main menu press:

  UTIL→**PWD**→**PWD=OFF** to **switch on** the administrative lock.

- ❑ When enabling the password, the Zoom will request the initial pin code. **NEW PIN**:_ _ _ _

- ❑ Enter a pin number using the keypad.

- ❑ Press **ENTER** to confirm your entry or press **EXIT** to leave the menu.

- ❑ Retype the previously entered number to confirm the desired PIN then press **ENTER** to confirm or **EXIT** to leave the menu.

In case of mismatch of the two numbers, the display will show an error message for approx. 2 seconds and then return to the password setup menu.

If the check of the numbers succeeded, the Zoom will show a message that confirms that a new pin had been set and returns to the password setup menu.

Please preserve your pin code!

Now, access to the menu entries **EDIT** and **MORE** of the **PROGRAM** menu, as well as the **PWD** sub menu item of the **UTIL** menu, are protected by the newly set pin code. The protection is indicated by a small 'key' sign next to the menu item. → **EDIT**

7.2 Editing programs with administrative lock enabled

If the administrative lock is enabled, the menu items **EDIT** and **MORE** of the **PROGRAM** menu show a key symbol. These items are only accessible after entering the correct pin.

- Starting from the Main menu press

  PROG → EDIT

- The administrative lock will then request the pin before gaining access to the protected sub menu: **ENTER PIN**:_ _ _ _.
- Enter the pin number using the keypad.
- Press **ENTER** to confirm your entry or press **EXIT** to leave the menu.

  When entered the correct pin, the program will move directly to the protected sub menu (e.g. SELECT PROGRAM NUMBER).

  In case of the wrong pin, the Zoom will show an error message and return to the previous menu.

7.3 Changing the pin code

Follow the instructions below to change the current password for the administrative lock:

- ❑ Starting from the **Main menu** press:

  UTILS → **PWD** ⚷

- ❑ The administrative lock will request the pin: **ENTER PIN**:_ _ _ _.
- ❑ Enter the pin number using the keypad.
- ❑ Press **ENTER** to confirm your entry or press **EXIT** to leave the menu.

  In case of the wrong pin, the Zoom will display an error message and return to the previous menu.

  When entered the correct pin, the program will move directly to the **PWD SETUP MENU**.
- ❑ In the **PWD SETUP MENU** press: **CHANGE**
- ❑ When changing the password, the Zoom will request a new initial PIN code: **NEW PIN**:_ _ _ _
- ❑ Enter the pin number using the keypad and press **ENTER** to confirm your entry or **EXIT** to leave the menu.
- ❑ Retype the previously entered number to confirm the desired pin and press **ENTER** to confirm your entry or **EXIT** to leave the menu.

  In case of the mismatch of the two numbers, the display will show an error message for approx. 2 seconds and then return to the **PWD SETUP** top level menu.

  If the check of the numbers succeeded, the Zoom will show a message that confirms that a new pin had been setup and returns to the **PWD SETUP** top level menu.

Please preserve your pin code!

HINT: It is also possible to change the password by disabling administrative lock and enabling it again.

7.4 Disabling administrative lock

- ❑ Starting from the **Main menu** press:

  UTILS → **PWD** ⚷

- ❑ The administrative lock will request the pin: **ENTER PIN**:_ _ _ _.
- ❑ Enter the pin number using the keypad.
- ❑ Press **ENTER** to confirm your entry or press **EXIT** to leave the menu.

  In case of the wrong pin, the Zoom will display an error message and return to the previous menu.

  When entered the correct pin, the program will move directly to the **PWD SETUP MENU**.
- ❑ In the **PWD SETUP MENU** press: **PWD=ON** to turn off the administrative lock.
- ❑ Press **EXIT** to return to the **MAIN MENU**.

PIN Code lost

Please contact technical service in the case the password had been lost or could not be remembered!

8. Maintenance

8.1 Zoom Washer general care

- The frequency of maintenance and cleaning must match the actual frequency of usage to prevent accelerated aging and abrasion. Some or all procedures can be performed more frequently than presented in the maintenance schedule table below.

Recommended Maintenance Schedule: **Tasks for all models**

	Purpose/Frequency			
	Daily/ before/ after use	**Monthly/ As needed**	**Yearly/ As needed**	**Before Storage/ Shipment**
Clean external surface		✓		
Clean washer components		✓		
Run a prime program for your used inlets (or #90 (prime)for inlet 1) using distilled water. Run a dispense program for your inlet (or#91 (dispense)for inlet 1)and visually inspect if dispense is even in all wells	✓			
Run wash program for your used inlet (or #92 (wash)for inlet 1) using distilled water. Verify residual volume is equal to or less than 2 µl. Use the same microplate daily.	✓			
Run a prime program for your used inlet (or program #90 (prime)) with distilled water at end of day	✓			
Decontaminate instrument				✓
Replace PVC hoses			✓	
Replace valve/syringe assembly			✓	

- Clean the external surfaces of the instrument and the plate carrier with a damp cloth or use a mild detergent when necessary.
- Clean the washer components (Dispense Module manifolds, plate carrier, bottles, and tubing) at least monthly. The risk and performance factors associated with your assays may require that cleaning be performed more frequently.
- Flush all lines of the Zoom Washer and the Dispense Module, with distilled or deionized water after every use to prevent the aspirate and dispense tubes from clogging before and between washes.
- **If the system is left idle overnight:** Flush all lines of the Zoom Washer and the Dispense Module, with distilled or deionized water if the washer is left idle overnight.
- **In cases of longer breaks:** Flush all lines of the Zoom Washer and the Dispense Module, with 70% Isopropanol or 70% Ethanol to prevent the aspirate and dispense tubes from growing algae or bacteria. Empty the lines afterwards and dry them by pumping air.
- **Decontamination:** Before storage and shipment the instruments must be decontaminated.

  Set up a cleaning program with dispense/prime and aspiration function for all used inlets of the washer. If the Dispense Module was used, setup a Dispense Module program for the used pumps, too. If sufficient use the predefined programs #90 - #92 (for inlet1 only), alternatively. Place an empty plate on the plate carrier (Zoom) or in the stacker magazine (Zoom HT).

  Place all buffer inlet lines and/or reagent inlet lines of the Dispense Module into DI water. Run the cleaning programs with de-ionized water

  Place all buffer inlet lines and/or reagent inlet lines of the Dispense Module into 70% Isopropanol or Ethanol. Run the cleaning programs with 70% isopropanol or Ethanol. Incubate (wait) for 10 min to decontaminate dispense and aspiration lines properly.

  Run the cleaning programs without liquid to dry all lines.

8.2 Vacuum Pump and Trap care

The vacuum pumps internal parts are very sensitive to moisture; you must use care in preventing moisture from entering the pump.

- ❑ The peristaltic pump is self-emptying. It should not contain an excessive liquid level in the trap while operating. Replace the peristaltic pump tubing if necessary.
- ❑ If the filter collects moisture, damage to the pump or incomplete aspiration may occur. Replace the vacuum filter if moisture is observed.

8.3 Cleaning the 96 Channel Aspirate Head

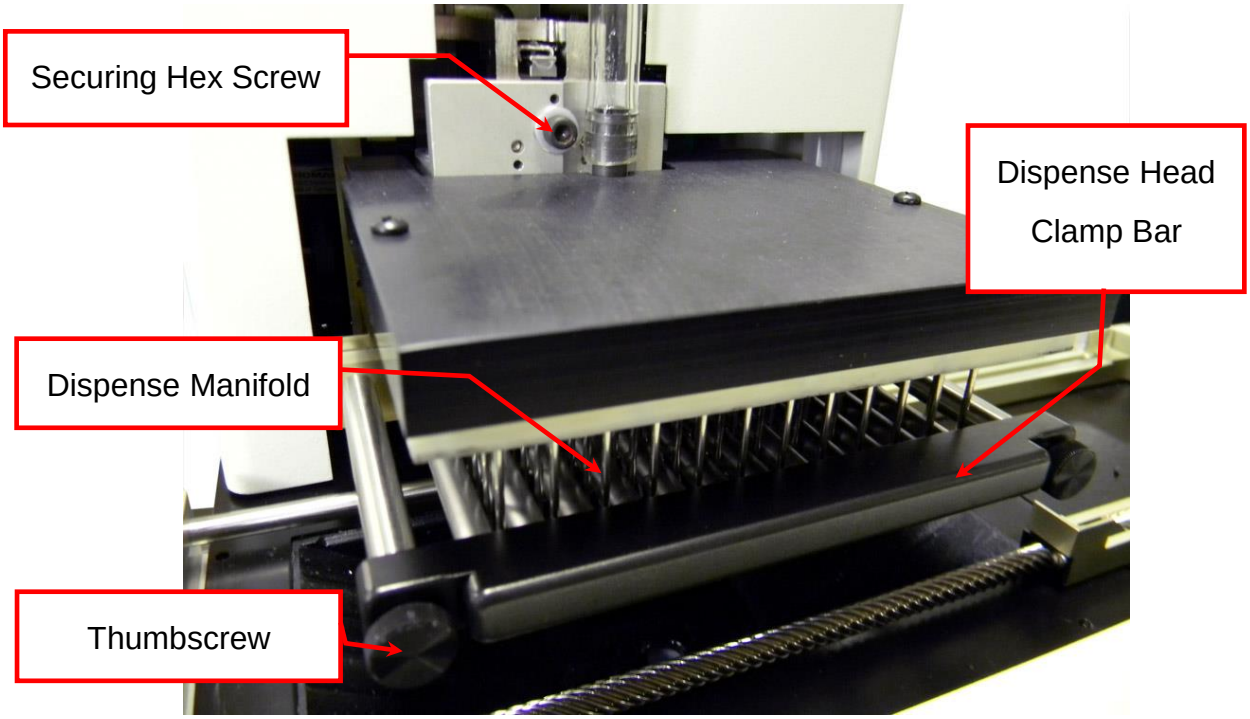


Illustration 8.1:
96 Channel Aspirate head.

The Zoom Washer is virtually maintenance free if the above general care instructions are followed. These cleaning instructions for the 96-Channel Aspirate Head are provided for special circumstances.

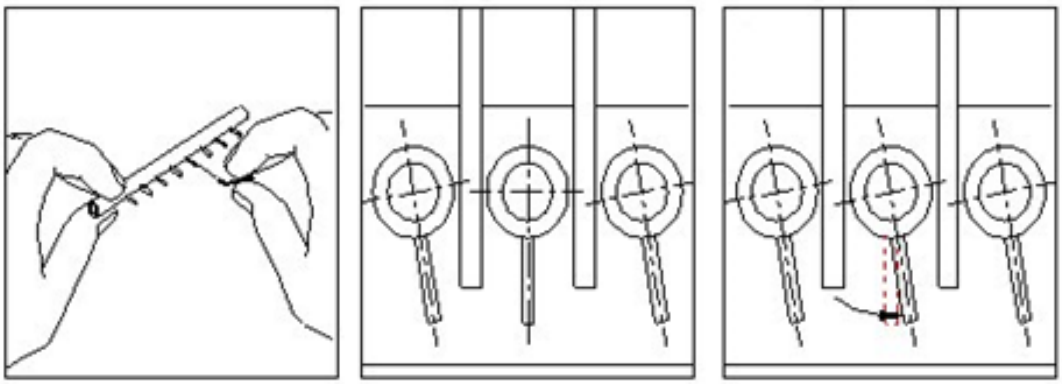
1. Remove the vacuum line from the connector on the top of the 96 channel aspirate head.
2. Undo the thumbscrews securing the dispense head clamp bar.
3. Remove the clamp bar.
4. The 96 Channel Aspirate Head is secured to the “Z” Drive by a hex screw. It can be removed using the provided 5/32” sized Allen key. In order to clean the 96-Channel Aspirate Head, remove the hex screw with the provided Allen key, and lift the head off the “Z” Drive bracket.
5. Slide the head toward the front of the unit until it clears the dispense.
6. Use the Vacuum Tube Cleaning Wire (0.020 ID) to probe the clogged tubes.
7. Once all of the clogged tubes have been cleared, rinse the head in deionized water.

8.4 Cleaning the 96 well Dispense Manifold

The Zoom Washer is virtually maintenance free if the above general care instructions are followed. These cleaning instructions for the Dispense Manifolds are provided for special circumstances.

Refer to illustration 8.1, too.

1. Undo the thumbscrews securing the Dispense Head Clamp Bar.
2. Remove the clamp bar. Gently extract the dispense manifold(s) to be cleaned.



3. Push the Dispense Head Clamp Bar over the Dispense Manifolds. Make sure all the Dispense Manifolds are positioned properly.

4. Check that all Dispense Manifolds are aligned. Secure the Dispense Head Clamp Bar with the thumbscrews.

8.5 Dispense Module maintenance

Restoring a syringe seal

The syringes may leak from the bottom when the seal between the syringe piston and syringe barrel becomes worn through use. When this occurs, the syringe may have to be replaced. Before you order a new syringe, try restoring the seal by following this procedure:

1. Remove the syringe piston from the syringe barrel.
2. Place the syringe piston in hot (not boiling) water for two to five minutes in a vertical position as shown in Illustration 8.2. Do not lay the syringe piston down or allow the seal to contact anything, this may deform the seal**.**

Illustration 8.2: A Syringe piston (seal is the top white part)

3. Remove the piston from the hot water and allow the piston seal to cool; Keep the piston in a vertical position.
4. Replace the syringe piston in the syringe barrel. If the syringe continues to leak, you will have to replace the syringe.

The Teflon® seal expands when heated. This procedure expands the seal's size for a tighter fit in the syringe barrel.

Valve Cone maintenance:

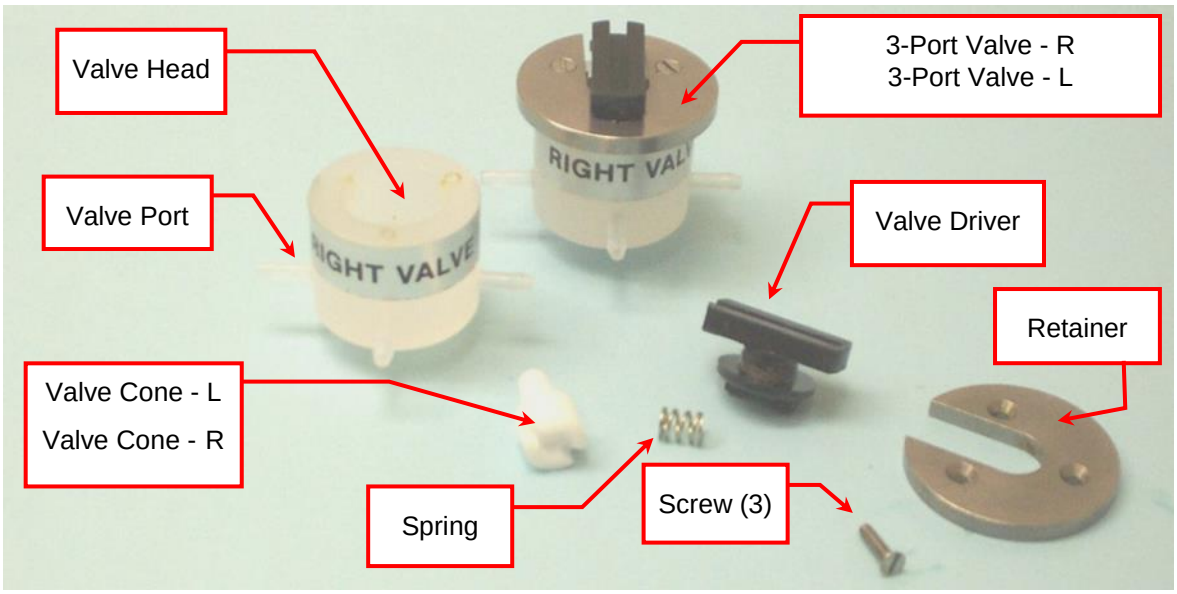


Illustration 8.3: Disassembled 3-Port Valve

Occasionally the valve cone in the 3-port valve may require cleaning or replacement. In either case, the 3-port valve must be disassembled to remove the valve cone. The procedure is the same for both the left and right 3-port valve. **The valve cones are not interchangeable**. A 3-port valve repair kit is available from Titertek-Berthold. If you need to disassemble the 3-port valve, follow these steps:

1. Remove the syringe from the Dispense Module and unscrew the 3-port valve from the syringe.
2. The metal retainer is secured to the valve head by three flat head screws. Remove the head screw from the front of the metal retainer first. You may have to rotate the valve driver to gain access to this screw. After the front screw has been removed, position the open end of the slot on the valve driver so that it faces the rear of the valve head. Remove the two rear screws.
3. Lift off the metal retainer and the valve driver and remove the spring.
4. Carefully remove the Teflon® valve cone from the valve body. You may have to use a pair of needle nose pliers to access the cone for removal.

   Important! Make note of the correct positioning of the Teflon® cone in the valve body before removing.

5. If the valve cone is not damaged or scarred and only needs cleaning, clean the valve cone and the valve head with a cotton-tipped applicator using detergent, distilled water and alcohol, being careful not to scratch the valve face. These parts should be air-dried.

6. Replace the cleaned (or new) Teflon® valve cone into the valve head. The small hole on the tapered portion of the valve cone must be aligned with **port number one** of the valve head.
7. Replace the spring and the valve driver. The open end of the slot on the valve driver should face the rear of the valve head. Make sure the tabs on the bottom of the valve driver are fully engaged with the slots on the valve cone. Replace the metal retainer and the three flat head screws. Check the valve assembly for smooth operation.

Replacing a broken valve port

1. To remove a broken port, cut the port off flush with the valve head.
2. Screw a No. 2 wood screw into the port about three or four times. The screw is included in an available 3-port valve repair kit.
3. Grip the head of the screw with a pair of pliers and pull the broken port straight out of the valve head.
4. To install a new port, insert the formed end of the port into a port assembly tool. The tool is included in the 3-port valve repair kit. Push the free end of the port firmly into the valve body.
5. Support the valve body on a bench and position the port tool vertically.
6. Tap the port tool gently with a small hammer until the port bottom is fully inserted into the valve head.

Cleaning and replacing needles in manifolds

Illustration 8.4: 8 tip manifold with 0.015 ID tips for a 10 ml syringe

Illustration 8.5: 16 tip manifold with 0.015 ID tips for a 10 ml syringe

1. Dispense Module manifolds give the best results when clean. The needles can be cleaned using a tube cleaner. If cleaning the needle does not correct a dispensing problem, the needle may be replaced.
2. Unscrew the defective needles by using a Needle Removal Tool. Use the same tool to insert new needles into the manifold.

The Needle Insertion Tool should position the tip of the needle aligned with the other needles in the manifold. Minor adjustments to the needle may be required to make sure all of the tips aligned.

8.5.1 Replacement of valve/syringe assembly

If Valve/Syringe assembly removal or replacement is necessitated, use the following instructions:

- ❑ Enter install syringe mode by first pushing soft key 3 underneath **UTILS** to enter the utility menu, then push soft key 4 underneath **INSYR** to enter install syringe mode. The piston drive rods will cycle down allowing installation of syringes.

Prepare the valve/syringe assemblies:

- ❑ First, locate the valves, syringe barrels, and syringe pistons. Then, secure the syringe barrel and tighten the valve onto it by turning it clockwise. Leave a small gap between the valve and the metal top of the syringe barrel approximately 0.025” – 0.050” (or 0.6 mm – 1.2 mm). The syringe valve will fit on tight with the optimal gap present. Further tightening is not necessary. See illustrations 8.6 and 8.7.

Illustration 8.6:
Syringe barrel (with piston inside barrel) and Valve prior to assembling.

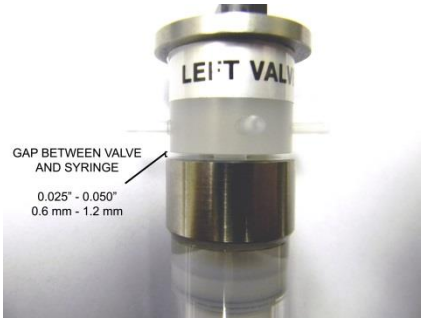


Illustration 8.7:
Syringe/Valve assembly

Install the 10 ml syringes:

Proceed with the instructions on the following pages for installation of the 10 ml syringes:

Illustration 8.8: The piston drive rods before install syringe mode (left) and during install syringe mode (right)

- ❑ Ensure the valve locking knobs are in the unlocked position as shown in Illustration 8.9 before installing the valve/syringe assemblies.

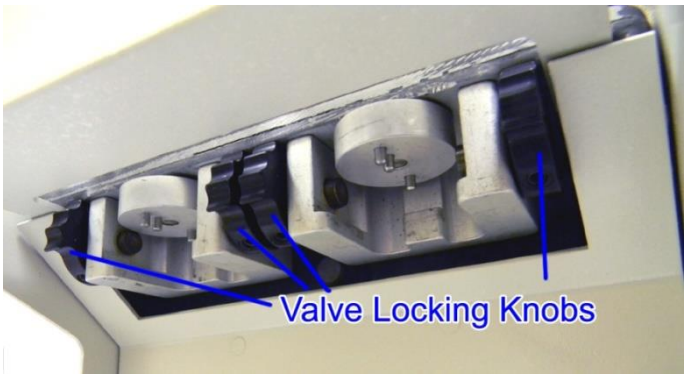


Illustration 8.9:
The Valve Locking Knobs in the unlocked position.

- ❑ Refer to Illustration 8.10 for proper valve drive alignment prior to installing valve/syringe assemblies.

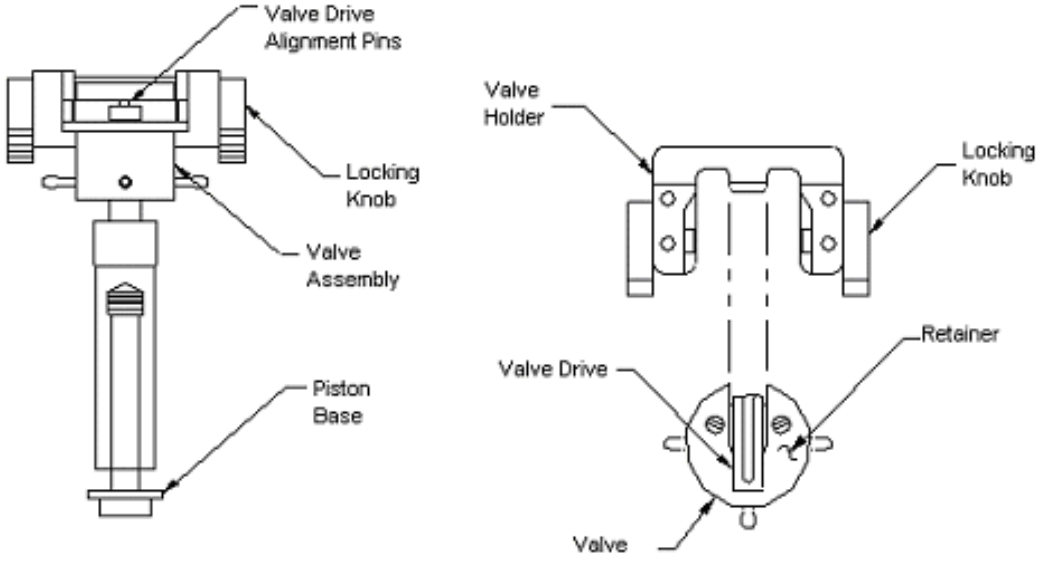


Illustration 8.10: Valve Drive Alignment

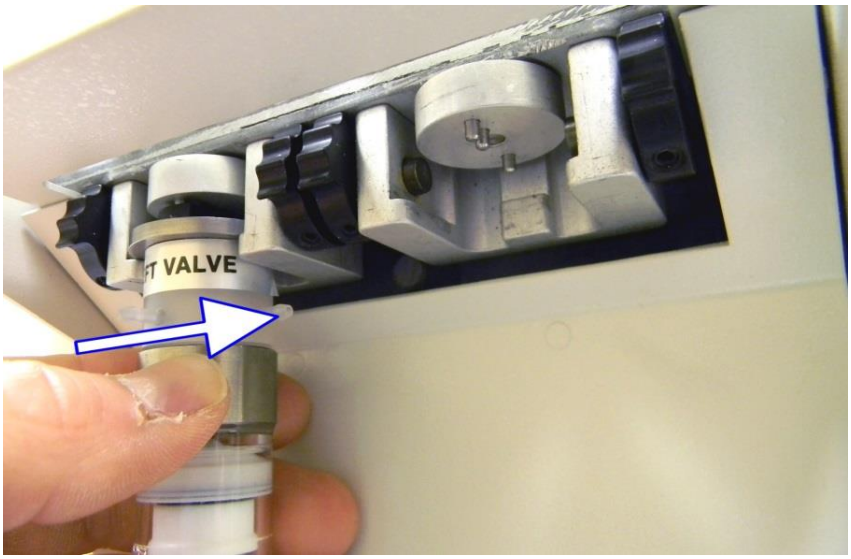


Illustration 8.11: Inserting the valve/ syringe assembly into the Dispense Module's valve holder

- ❑ To install the Valve, the Valve Drive and Retainer should be aligned with the Valve Holder as shown in Illustration 8.11. Make sure the valve is fully inserted into the valve holder. While pushing the valve/syringe assembly into the Valve Holder with one hand, rotate the locking knobs downward to lock the valve into position with your other hand.

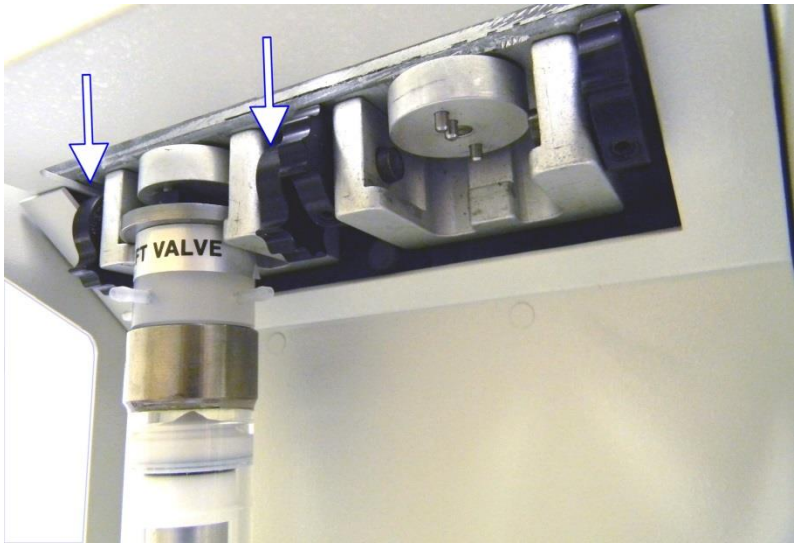


Illustration 8.12: Installed Valve in the locked position.

- ❑ Next, firmly hold the valve/syringe assembly in place with one hand, while pulling the syringe piston down to the piston drive rod. Attach the syringe piston to the piston drive rod by turning the syringe piston base CLOCKWISE. As you turn the syringe piston apply downward force.

- When the syringe piston is secured to the piston drive rod, continue to hold down the secured piston to the piston drive rod. Pull the barrel of the syringe upward and twist the threaded end back into place onto the installed valve by turning the barrel COUNTER CLOCKWISE. Do not over tighten.

Refer to Illustration 8.13.
Ensure both the syringe piston is tightly secured to the piston drive rod, and the syringe barrel is secured to the syringe valve before proceeding.

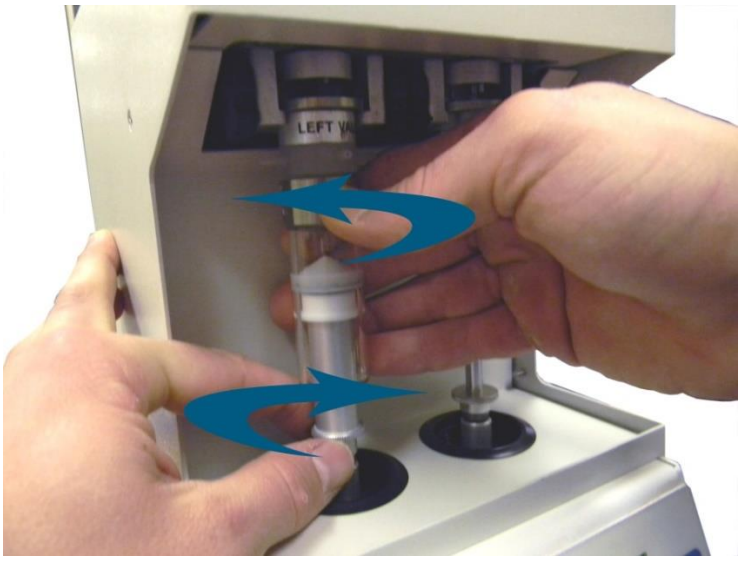


Illustration 8.13: Securing both the syringe piston base to the piston drive rod and the syringe barrel to the syringe valve.

Note: A properly installed syringe piston will have **no** gap between the syringe piston base and the Dispense Module's piston drive rod.

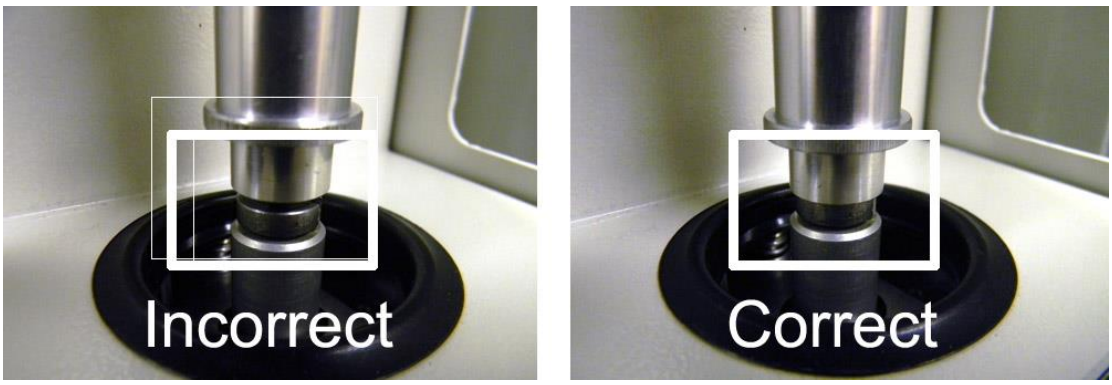


Illustration 8.14: Securing both the syringe piston base to the piston drive rod and the syringe barrel to the syringe valve.

- ❑ When installation of the valve/syringe assemblies is completed, press soft key **ENTER** on the Zoom keypad. The pistons will return to the home position and the size of each syringe will be sensed and displayed on the display.

  Read syringe size → Syringes: 10ml , 10ml

Important! If the Dispense Module is not sensing the syringe sizes correctly, enter Install Syringe Mode again and reinstall the incorrectly sensed valve/syringe assembly. This commonly happens when the syringe valve is not seated fully in the Dispense Module Valve Holder or when the syringe piston is not tightened completely to the Dispense Module piston drive rods.

- ❑ Attach tubing to the 10ml syringes after valve/syringe assemblies are installed. Refer to chapter 2.5 for details.

9. Troubleshooting

9.1 Troubleshooting the Zoom washer

IMPORTANT! Check that all cables and hoses are connected into the correct ports and are secure and/or locked. Check to make sure all power switches are powered “ON”. These are the causes of most problems. Even professionals make these simple mistakes!

PROBLEM	CAUSE/SOLUTION
Plates in magazines drop onto carriage when Zoom Washer is powered on.	This is normal and happens sometimes. Do not power on with plates.
Zoom Washer is frozen up. It won’t do anything.	Re-start the device
Problem with plate not seating correctly on the carriage after dropping down from input magazine.	Plates may not have been nested properly. Try putting plates in output magazine, and then do a restack.
Washing with viscous buffer and aspirate tubes drip buffer after the wash is finished.	Link the following cycles: Wash - as you are doing it now. Aspirate - with aspirate time sufficient to clear the lines.
Plate crashes into aspirate head needles.	Reset plate profile settings. Ensure plate is seated securely in carriage.
Plate carriage stalls.	Check for mechanical obstructions.
96 Well Aspirate Head is not aspirating all of the wells properly. Residual liquid remains after aspiration.	Ensure vacuum tubing from 96 Channel Aspirate Head to Trap is not tight or restricted. Optimize plate profile settings: Aspirate head clearance may be set too high or too low. Also try increasing sweep of Super Vac setting in profile.

PROBLEM	CAUSE/SOLUTION
	Ensure vacuum tubing is not clogged. Ensure aspirate tubes on 96 Channel Aspirate Head are not clogged. See above instructions for cleaning the 96 Channel Aspirate Head. Vacuum tube lengths between pump, trap, and Zoom Washer may be too long; limit the total length to 10 feet. Ensure instrument is placed on a known flat surface. Use a spirit level if doubts exist. Vacuum pump filter might be saturated with moisture, replace it if necessary. If the Vacuum pump is faulty call Titertek Service.
Error (12) – P when trying to run program.	Plate is seen on carriage. Take plate off carriage and try again.

9.2 Troubleshooting the Dispense Module

PROBLEM	CAUSE/SOLUTION
Invalid syringe response or syringe not detected.	The syringe is not properly installed. Ensure the piston base is tight on the piston drive rod and the Valve Drive and Retainer are aligned with the syringe Valve Holder and seated back securely.
Syringes stall.	Check to make sure the inlet or outlet tubing is not pinched. The manifold tips might be blocked, clean them with a tip cleaner. Ensure piston seal is not dirty, clean with a soft cloth. Remove the valve assembly and clean the internal parts with water or alcohol if the valve is not shifting properly. If the syringe piston has driven beyond the home position call Titertek service.
Syringes make grinding noise at top of upstroke.	This is normal. Zoom Washers are shipped with Low Dead Volume Dispense Modules. In order to minimize the residual syringe liquid the Dispense Modules are designed to make a push at the end of the upstroke.
8 or 16 well dispense manifold (non-metallic tips) drip.	Replace the tubing if there is a leak in the outlet port tubing. Ensure outlet port on valve body is not cracked or broken. Check manifold and repair or replace faulty needle if the needle is not properly seated in manifold body. Make sure reagents are placed on the same level as syringes; otherwise gravity may pull reagents through the lines and drip.

10. References

10.1 Technical data

Zoom HT

Configuration	
Wash Head	96 channel wash head for fastest processing of 96 and 384 well microplates
Microplates	96 well plates and strips, 384 well; Dimensions according to ANSI SLAS
Stacker	One-rail design connecting wash, dispense, and storage positions in short distance on one level
Settings (96 channel)	
Dispense Volume	5-300µl
Shaking	Up to 80s, amplitude 1mm, frequency 12Hz
Aspirate Tip Descent Speeds	Slow / Medium / Fast
Soak Time	0-99s
Wash Modes	Regular and Superwash
Number of Programs	1-99
Wash Cycles per Program	1-99
Wash Fluid Selection	1 inlet (standard), 2 or 4 inlet versions
Protocol Protection	Admin mode to prevent unauthorized changes
Performance	
Dispense Accuracy	± 2 % typical @ 50-300µl range
Dispense Precision	≤ 2,5% CV @ 200µl ≤ 3 % CV @ 100µl ≤ 4,5 % CV @ 50µl
Residual Volume	< 2µl / well
Plate Processing Speed	96 well plate, 1 cycle 300µl incl. stack: 14s 96 well plate, 3 cycles 300µl incl. stack: 24s 384 well plate, 3 cycles 75µl incl. stack: 44s
General Specifications	
Dimensions (HxWxD)	61x69x56cm / 24x27x22inch
Weight	29.5 kg / 65lb
Power Consumption	300 VA
Power Requirements	100-120V 50/60Hz; 220-240V 50Hz
Operating temperature	10-40°C
Liquid Path Materials	Stainless steel, Teflon® , PVC, Norprene, Silicone, Polysulfone

Zoom

Performance Specification	
Microplate Type	96 well standard height and low profile
Wash Manifold	96 channel
Dispense Accuracy	± 2 % typical @ 50-300µl range
Dispense Precision	≤ 2,5% CV @ 200µl ≤ 3 % CV @ 100µl
Wash Volume	1-2000µl selectable in 1µl increments
Residual Volume	< 2µl / well
Wash Fluid Flow Rate	1-7(Zoom), 1-8 (Zoom HT)
Aspirate Tip Descent Speeds	Slow / Medium / Fast
Soak Time	0-99s
Wash Modes	Regular and Superwash
Number of Programs	1-99
Wash Cycles per Program	1-99
Wash Fluid Selection	1 inlet (standard), 2 or 4 inlet versions
Protocol Protection	Admin mode to prevent unauthorized changes
Plate Processing Speed	1 cycle, 300µl: 7s 3 cycles, 300µl: each 17s
General Specifications	
Dimensions (HxWxD)	38x56x36cm / 15x22x14inch
Weight	18 kg / 40lb
Power Consumption	80 VA
Power Requirements	115V 60Hz; 230V 50Hz
Operating temperature	10-40°C / 50-104°F

Dispense Module

Configuration	
Dispense Manifolds	8-way and 16-way manifolds available
Dispense Manifold Ports	2 in direct proximity to wash head for immediate dispensing after aspiration
Syringe Size	2x10ml, separate channels
Dispensing Technology	Positive Displacement
Settings	
Dispense Speeds	1-8
Number of Reagents	Up to 2
Dispense Volume	5-300µl

Performance	
Dispense Accuracy	≤ 1 % @ 100µl
Dispense Precision	≤ 1% CV @ 200µl ≤ 3 % CV @ 50µl ≤ 5 % CV @ 10µl
General Specifications	
Dimensions (HxWxD)	17x22x40cm / 6.7x8.7x15.8inch
Weight	212 kg / 26lb
Power Consumption	175 VA
Power Requirements	100-120V 50/60Hz; 220-240V 50Hz
Operating temperature	10-40°C
Liquid Path Materials	Glass, Teflon®, Kel-F

10.2 Accessories

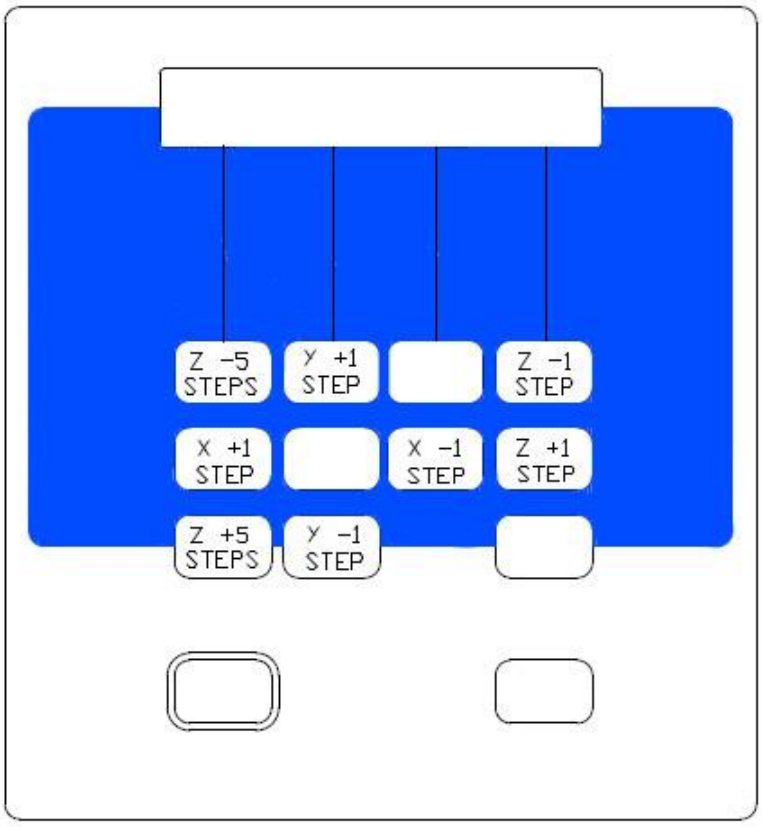
IQ/OQ/PQ Manual for Zoom and Zoom HT Washer**.**

Strip Push-Down Device for Zoom HT Washer. Applicable for strip plates.

30-Plate Magazine

For spare parts:
Please contact your local distributor or techservice@titertek-berthold.com

10.3 Zoom Washer Profile Guide



X +1 STEP	**Soft-key 5**	Moves the plate carriage **ONE** step to the **LEFT**
X -1 STEP	**Soft-key 7**	Moves the plate carriage **ONE** step to the **RIGHT**
Y+1 STEP	**Soft-key 2**	Moves the aspirate head assembly **ONE** step **OUT**
Y -1 STEP	**Soft-key 0**	Moves the aspirate head assembly **ONE** step **IN**
Z +1 STEP	**Soft-key 8**	Moves the aspirate head assembly **ONE** step **DOWN**
Z -1 STEP	**Soft-key 4**	Moves the aspirate head assembly **ONE** step **UP**
Z +5 STEPS	**Soft-key 9**	Moves the aspirate head assembly **FIVE** steps **DOWN**
Z -5 STEPS	**Soft-key 1**	Moves the aspirate head assembly **FIVE** steps **UP**

10.4 Factory Programs for Zoom HT Washer

The Zoom HT Washer is delivered with a number of preset programs for a quick start and performance testing after installation. These programs are not permanently stored and parameters can be overwritten. Aspirate X/Y/Z and dispense X/Y profile settings are unit specific and may be slightly different for your device (if so, typically 1-digit range difference).

Performance check programs using the 96-well test plate

90	Prime 96-head, 5 cycles (Flush internal dispense pump)

Profile Parameter

Asp profile			Disp. Profile		SVac		Swash		
X	Y	Z	X	Y	X	Y	X	Y	Z
1727	100	10	1735	100	7	4	1727	100	15

Prime Parameter

Pump or Syringe	Volume	Cycles	Disp. Speed	Prime to Container	Link to Cycle	Link to Prog
Pump	50 ml	5	1	no	no	no

91	Dispense with 96-head, 300 µl

Profile Parameter

Asp profile			Disp. Profile		SVac		Swash		
X	Y	Z	X	Y	X	Y	X	Y	Z
1727	100	10	1735	100	7	4	1727	100	15

Dispense Parameter

Pump or Syringe	Volume	Disp. Speed	Soak Time	Shake Time	Link to Cycle	Link to Prog
Pump	300 µl	1	0	0	no	no

92	Wash 300 µl, 1 cycle

Profile Parameter

Asp profile			Disp. Profile		SVac		Swash		
X	Y	Z	X	Y	X	Y	X	Y	Z
1727	100	100	1735	100	10	20	1727	100	15

Wash Parameter

Volume	Cycles	Asp Time	Head Speed	Pump Speed	Soak Time	LastAsp Time	Super Wash	Link to Cycle	Link to Prog
300 µl	1	1	fast	1	0	4	no	no	no

Other preset programs

1	**Prime 96-head, 3 cycles**

Profile Parameter

Asp Profile			Disp. Profile		SVac		SWash		
X	Y	Z	X	Y	X	Y	X	Y	Z
1727	100	10	1735	100	7	4	1727	100	15

Prime Parameter

Pump or Syringe	Volume	Cycles	Disp. Speed	Prime to Container	Link to Cycle	Link to Prog
Pump	50 ml	3	1	no	no	no

2	**Wash 300 µl, 3 cycles**

Profile Parameter

Asp profile			Disp. Profile		SVac		SWash		
X	Y	Z	X	Y	X	Y	X	Y	Z
1727	100	100	1735	100	10	20	1727	100	15

Wash Parameter

Volume	Cycles	Asp Time	Head Speed	Pump Speed	Soak Time	LastAsp Time	Super Wash	Link to Cycle	Link to Prog
300 µl	3	1	fast	1	0	2	no	no	no

3	**Wash 70 µl, 3 cycles (384-well plate)**

Profile Parameter

Asp-384-P1			ASP-384-O2		DISP X-JOG
1717	127	100	1737	73	X=08

Wash Parameter

Volume	Cycles	Asp Time	Head Speed	Pump Speed	Soak Time	LastAsp Time	Super Wash	Link to Cycle	Link to Prog
70	3	1	fast	1	0	2	no	no	no

Preset programs for Dispense Module

4	Prime both 8-tip manifolds

Profile Parameter

Asp Profile			Disp. Profile		SVac		SWash		
X	Y	Z	X	Y	X	Y	X	Y	Z
1727	100	10	1735	100	7	4	1727	100	15

Prime Parameter

Pump or Syringe	Volume	Cycles	Inlet/Outlet Port	Select Manifold	Disp. Speed	Prime to Container
10 ml	5000 µl	5	In: 1 Out: 2	Man1+2	Fast	no

5	Dispense with manifold-1

Profile Parameter

Asp Profile			Disp. Profile		SVac		SWash		
X	Y	Z	X	Y	X	Y	X	Y	Z
1727	100	10	1735	100	7	4	1727	100	15

Dispense Parameter

Pump or Syringe	Volume	Inlet/Outlet Port	Select Manifold	Disp. Speed	Soak Time	Shake Time	Link to Cycle	Link to Prog
10 ml	100 µl	In: 1 Out: 2	Man1	Fast	0	0	no	no

6	Dispense with manifold-2

Profile Parameter

Asp Profile			Disp. Profile		SVac		SWash		
X	Y	Z	X	Y	X	Y	X	Y	Z
1727	100	10	1735	100	7	4	1727	100	15

Dispense Parameter

Pump or Syringe	Volume	Inlet/Outlet Port	Select Manifold	Disp. Speed	Soak Time	Shake Time	Link to Cycle	Link to Prog
10 ml	100 µl	In: 1 Out: 2	Man2	Fast	0	0	no	no

10.5 Factory Programs for Zoom Washer

The Zoom HT Washer is delivered with a number of preset programs for a quick start and performance testing after installation. These programs are not permanently stored and parameters can be overwritten.
Aspirate X/Y/Z and dispense X/Y profile settings are unit specific and may be slightly different for your device (if so, typically 1-digit range difference).

Performance check programs using the 96-well test plate

90 Prime 96-head, 5 cycles (Flush internal dispense pump)

Profile Parameter

Asp profile			Disp. Profile		SVac		Swash		
X	Y	Z	X	Y	X	Y	X	Y	Z
567	100	10	574	100	5	4	567	100	10

Prime Parameter

Pump or Syringe	Volume	Cycles	Disp. Speed	Prime to Container	Link to Cycle
Pump	50 ml	5	1	no	no

91 Dispense with 96-head, 300 µl

Profile Parameter

Asp profile			Disp. Profile		SVac		Swash		
X	Y	Z	X	Y	X	Y	X	Y	Z
567	100	10	574	100	5	4	567	100	10

Dispense Parameter

Pump or Syringe	Volume	Disp. Speed	Soak Time	Shake Time	Link to Cycle
Pump	300 µl	1	0	0	no

92 Wash 300 µl, 1 cycle

Profile Parameter

Asp profile			Disp. Profile		SVac		Swash		
X	Y	Z	X	Y	X	Y	X	Y	Z
567	100	100	574	100	10	20	567	100	10

Wash Parameter

Volume	Cycles	Asp Time	Head Speed	Pump Speed	Soak Time	LastAsp Time	Super Wash	Link to Cycle	
300 µl	1	1	fast	1	0	4	no	no	

Other preset programs

1	Prime 96-head, 3 cycles

Profile Parameter

Asp Profile			Disp. Profile		SVac		SWash		
X	Y	Z	X	Y	X	Y	X	Y	Z
567	100	10	574	100	5	4	567	100	10

Prime Parameter

Pump or Syringe	Volume	Cycles	Disp. Speed	Prime to Container	Link to Cycle
Pump	50 ml	3	1	no	no

2	Wash 300 µl, 3 cycles

Profile Parameter

Asp profile			Disp. Profile		SVac		SWash		
X	Y	Z	X	Y	X	Y	X	Y	Z
567	100	100	574	100	10	20	567	100	10

Wash Parameter

Volume	Cycles	Asp Time	Head Speed	Pump Speed	Soak Time	LastAsp Time	Super Wash	Link to Cycle	
300 µl	3	1	fast	1	0	2	no	no	

3	Wash 70 µl, 3 cycles (384-well plate)

Profile Parameter

Asp-384-P1			ASP-384-O2		DISP X-JOG
559	127	100	576	73	X=08

Wash Parameter

Volume	Cycles	Asp Time	Head Speed	Pump Speed	Soak Time	LastAsp Time	Super Wash	Link to Cycle	
70	3	1	fast	1	0	2	no	no	

Preset programs for Dispense Module

4	**Prime both 8-tip manifolds**

Profile Parameter

Asp Profile			Disp. Profile		SVac		SWash		
X	Y	Z	X	Y	X	Y	X	Y	Z
567	100	10	574	100	5	4	567	100	10

Prime Parameter

Pump or Syringe	Volume	Cycles	Inlet/Outlet Port	Select Manifold	Disp. Speed	Prime to Container
10 ml	5000 µl	5	In: 1 Out: 2	Man1+2	Fast	no

5	**Dispense with manifold-1**

Profile Parameter

Asp Profile			Disp. Profile		SVac		SWash		
X	Y	Z	X	Y	X	Y	X	Y	Z
567	100	10	574	100	5	4	567	100	10

Dispense Parameter

Pump or Syringe	Volume	Inlet/Outlet Port	Select Manifold	Disp. Speed	Soak Time	Shake Time	Link to Cycle
10 ml	100 µl	In: 1 Out: 2	Man1	Fast	0	0	no

6	**Dispense with manifold-2**

Profile Parameter

Asp Profile			Disp. Profile		SVac		SWash		
X	Y	Z	X	Y	X	Y	X	Y	Z
567	100	10	574	100	5	4	567	100	10

Dispense Parameter

Pump or Syringe	Volume	Inlet/Outlet Port	Select Manifold	Disp. Speed	Soak Time	Shake Time	Link to Cycle
10 ml	100 µl	In: 1 Out: 2	Man2	Fast	0	0	no

11. Decontamination form

Any laboratory instrument used in Life Sciences research and analysis may be considered a biohazard and requires decontamination prior to handling. Universal precautions are suggested wherever applicable.

Before returning an instrument to Titertek-Berthold it has to be cleaned and decontaminated according to following instructions. Refer to chapter XX for details.

1. Wash the housing with a moist cloth, if necessary use a mild detergent or disinfectant.
2. Set up a cleaning program with dispense/prime and aspiration function for all used inlets of the washer. If the optional Dispense Module was used, setup a Dispense Module program for the used pumps, too. Place an empty plate on the plate carrier (Zoom) or in the stacker magazine (Zoom HT).
3. Place all buffer inlet lines and/or reagent inlet lines of the Dispense Module into DI water. Run the cleaning program with de-ionized water
4. Place all buffer inlet lines and/or reagent inlet lines of the Dispense Module into 70% Isopropanol or Ethanol. Run the cleaning program with 70% isopropanol or Ethanol. Incubate (wait) for 10 min to decontaminate dispense and aspiration lines properly.
5. Run the cleaning program without liquid to dry all lines.
6. Assure that the liquid trap is empty. If not, repeat step 5.
7. Remove cables and tubing from rear of washer. Lift washer at the front to remove any residual liquid through the drain outlet (back side of washer!).

Berthold Detection Systems can only accept a returned instrument with a completed and signed decontamination form. Thank you.

Instrument Type:

Serial Number:

☐ I confirm that the specified instrument was decontaminated according to the above described decontamination procedure.

☐ I confirm that the above specified instrument had no contact with any hazardous material.

Company Name	
Contact Person	
Position	
Telephone	

Date:_____ Signature: _____

Berthold Detection Systems GmbH, Bleichstrasse 56-68, D-75173 Pforzheim,
Tel: +49(0)7231/9206-0, Fax -50

12. Index