
**CETAC QuickWash Accessory
Operator's Manual
#480151**

Product Warranty Statement

SD Acquisition, Inc., DBA CETAC Technologies (“CETAC”), warrants any CETAC unit manufactured or supplied by CETAC for a period beginning on the date of shipment and ending on the sooner to occur of: (a) the date that is twelve (12) months from the date of installation, or (b) the date that is thirteen (13) months from the date of shipment. Units found in the reasonable judgement of CETAC to be defective in material or workmanship will be repaired or replaced by CETAC without charge for parts and labor. CETAC reserves the right to change or improve the design of any unit without assuming any obligation to modify any unit previously manufactured.

This warranty does not cover any unit that has been subject to misuse, neglect, negligence, or accident. The warranty does not apply to any damage to the unit that is the result of improper installation or maintenance, or to any unit that has been operated or maintained in any way contrary to the instructions specified in the CETAC operator’s manual. Operation of the CETAC unit inside a laboratory fume hood is contra-indicated and will void the warranty. Any attempt to repair or alter any CETAC unit by anyone other than by CETAC authorized personnel or agents will void this warranty. If any non-CETAC component is installed in the CETAC manufactured unit without the approval of CETAC, the warranty will be voided. In addition, this warranty does not extend to repairs made necessary by the use of parts, accessories or fluids which are either incompatible with the unit or adversely affect its operation, performance or durability. CETAC’S obligation under this warranty is strictly and exclusively limited to repair or replacement of defective CETAC parts, and no claim of breach of warranty shall be cause for cancellation or rescission of the contract of sale of any unit.

The foregoing express warranty is in lieu of all other warranties, expressed or implied, including warranties of merchantability and fitness for a particular purpose. CETAC shall not be bound by any representations or statements on the part of its employees or agents whether oral or in writing and including any made in catalogues and other promotional material including technical details and specifications except where such representations and statements are expressly made part of this contract. CETAC assumes no responsibility for incidental, consequential or other damages, even if advised of such a possibility, including but not limited to loss or damage of property, loss of revenue, loss of use of the unit, loss of time, or inconvenience. CETAC’s liability on any claim for loss or damage arising out of the sale, resale or use of any of its products shall in no event exceed the selling price of the unit.

Purchaser shall indemnify CETAC against any claim or liability which may be asserted as relates to the following: (i) the use to which any product supplied hereunder is put infringes the patent, copyright or other intellectual property rights of any third party; or (ii) any liability resulting from the failure by Purchaser to observe the terms of this Warranty.

Returned Product Procedures

Claims for shipment damage (evident or concealed) must be filed with the carrier by the buyer. CETAC must be notified within ninety (90) days of shipment of incorrect materials. No product may be returned, whether in warranty or out of warranty, without first obtaining approval from CETAC. No replacements will be provided nor repairs made for products returned without such approval. Any returned product must be accompanied by a return authorization number. The expense of returning the unit to CETAC for service will be paid by the buyer. The status of any product returned later than thirty (30) days after issuance of a return authorization number will be subject to review. Shipment of repaired products will generally be made forty-eight (48) hours after the receipt.

Products may not be returned which are contaminated by radioactive materials, infectious agents, or other materials constituting health hazards to CETAC employees.

Returned Product Warranty Determination

After CETAC's examination, warranty or out of warranty status will be determined. If a warranted defect exists, the product will be repaired at no charge and shipped prepaid back to the buyer. If the buyer desires an air freight return, the product will be shipped collect. Warranty repairs do not extend the original warranty period.

If an out of warranty defect exists, the buyer shall be notified of the repair cost. At such time the buyer must issue a valid purchase order to cover the cost of repair and freight, or authorize the products to be shipped back as is, at the buyer's expense. Failure to obtain a purchase order number approval within fifteen (15) days of notification will result in the products being returned as is, at the buyers expense.

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480151 Version 2, August 2011

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REVISIONS

CETAC Technologies strives to provide the scientific community with an unparalleled combination of effective technology and continuing value. Modular upgrades for existing instruments will continue to be a prime consideration as designs progress.

CETAC Technologies reserves the right to revise this document and/or improve products described herein at any time without notice or obligation. Warranty registration entitles the named owner exclusively to manual change pages/new editions as they are published.

SAFETY

Instruments, accessories, components or other associated materials **may not** be returned to CETAC Technologies if contaminated with biohazard or radioactive materials, infectious agents, or any other materials and/or conditions that could constitute a health or injury hazard to CETAC employees. Call Customer Service and Support if there is any question or doubt relative to decontamination requirements. CAUTION and WARNING statements, as applied in this document, shall be interpreted consistent with the following context: CAUTION applies only to potential property damage conditions; WARNING applies to potential personal injury conditions, in combination with or exclusive of potential property damage.

All user-serviceable components are specifically identified in this document as such; the balance shall be assumed to require the expertise of a factory service technician/engineer for adjustment, repair, replacement, modification, etc. Others not so qualified and performing these actions shall do so at their own risk. Furthermore, never operate the instrument without first reading and understanding the *Aridus Desolvating Sample Introduction System Operator's Manual* and ensuring that it is operated safely and properly.

ORIGINAL PACKAGING

Retain original factory packaging for moves and factory return shipments. Shipping in anything other than the original fitted foam and container can result in incidental damage from which the purchaser will not be protected under warranty.

**FEDERAL COMMUNICATIONS
COMMISSION (FCC) NOTICE**

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential environment is likely to cause harmful interference, in which case the user will be required to correct the interference at his or her own expense.

MODIFICATIONS

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by CETAC Technologies may void the user's authority to operate the equipment.

CABLES

Connections to this device must be made with shielded cables with metallic RFI/EMI connector hoods to maintain compliance with FCC Rules and Regulations.

CANADIAN NOTICE

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus." ICES-001 of the Department of Communications.

AVIS CANADIEN

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques," NMB-001 édictée par le ministre des Communications.



Notices and Compliance Declarations

POWER CORD SET REQUIREMENTS

The power cord set supplied with your instrument meets the requirements of the country where you purchased the instrument.

If you use the instrument in another country, you must use a power cord set that meets the requirements of that country.

WARNING

This equipment is designed for connection to a grounded (earthed) outlet. The grounding type plug is an important safety feature. To reduce the risk of electrical shock or damage to the instrument, do not disable this feature.

CAUTION

To reduce the risk of fire hazard and electrical shock, do not expose the unit to rain or humidity. To reduce the risk of electrical shock, do not open the cabinet. All maintenance is to be performed by an Authorized CETAC Service Provider.

Protection provided by the equipment may be impaired if the equipment is used in a manner not specified by the manufacturer.

CLEANING INSTRUCTIONS

To clean the exterior surfaces of the instrument, complete the following steps:

- | | |
|---|--|
| 1 Shut down and unplug the instrument. | 3 Repeat step 2, using a towel dampened with clear water. |
| 2 Wipe the instrument exterior surfaces only using a towel dampened with a lab-grade cleaning agent. | 4 Dry the instrument exterior using a dry towel. |

WARNING

Do not allow any liquid to enter the instrument cabinet, or come into contact with any electrical components. The instrument must be thoroughly dry before you reconnect power, or turn the instrument on.

COOLING FAN OBSTRUCTION

The instrument cooling fan(s) shall remain unobstructed at all times. Do not operate the instrument if the cooling fan(s) are blocked or obstructed in any manner.

ENVIRONMENTAL

Operating Temperature:	10° to 30°C
Relative Humidity	0% to 95%


Operator's Manual Addendum
Notices and Compliance Declarations

WARNING
 FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH FUSES OF THE SPECIFIED TYPE AND CURRENT RATING.


FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH FUSES OF THE SPECIFIED TYPE AND CURRENT RATING.

⚠ AVERTISSEMENT
 POUR UNE PROTECTION CONTINUÉ CONTRE LES RISQUES D'INCENDIE, REMPLACER UNIQUEMENT PAR DES FUSIBLES DE MÊME TYPE ET AMPÉRAGE.


 **WARNING**
 DO NOT REACH UNDER OR BEHIND OVEN HEAT SHIELDS. KEEP FRONT CABINET DOOR TIGHTLY FASTENED TO PROTECT AGAINST SKIN BURN.

 **WARNING**
 DO NOT REACH UNDER OR BEHIND OVEN HEAT SHIELDS. KEEP FRONT CABINET DOOR TIGHTLY FASTENED TO PROTECT AGAINST SKIN BURN.

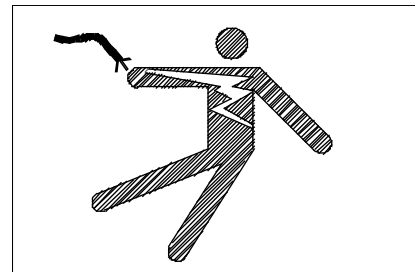
⚠ AVERTISSEMENT
 NE PAS GLISSER LA MAIN SOUS OU DERRIÈRE LES ÉCRANS THERMIQUES DU FOUR. GARDER LA PORTE D'ACCÈS AU DEVANT DU BOITIER BIEN FERMÉE POUR ASSURER LA PROTECTION CONTRE LES BRULURES

 **WARNING**
 THIS INSTRUMENT CONTAINS ELECTRICAL CIRCUITS, DEVICES, AND COMPONENTS OPERATING AT DANGEROUS VOLTAGES. CONTACT WITH THESE CIRCUITS, DEVICES, AND COMPONENTS CAN CAUSE DEATH, SERIOUS INJURY, OR PAINFUL ELECTRICAL SHOCK.
 OPERATORS AND OTHER UNAUTHORIZED PERSONNEL MUST NEVER OPEN THE MAIN COVER. THE MAIN COVER OF THIS INSTRUMENT MUST ONLY BE OPENED BY TRAINED, QUALIFIED, OR APPROVED SERVICE ENGINEERS.

⚠ AVERTISSEMENT
 TOUT CONTACT AVEC LES HAUTES TENSIONS PEUT ENTRAÎNER LA MORT OU DES BLESSURES SÉVÈRES. CE PANNEAU NE DOIT ÊTRE ENLEVÉ QUE PAR UN RÉPARATEUR QUALIFIÉ.

 **WARNING**
 THIS INSTRUMENT CONTAINS ELECTRICAL CIRCUITS, DEVICES, AND COMPONENTS OPERATING AT DANGEROUS VOLTAGES. CONTACT WITH THESE CIRCUITS, DEVICES, AND COMPONENTS CAN CAUSE DEATH, SERIOUS INJURY, OR PAINFUL ELECTRICAL SHOCK.
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WARNING
 CONTACT WITH DANGEROUS VOLTAGES CAN CAUSE DEATH OR INJURY. COVER TO BE REMOVED ONLY BY TRAINED SERVICE PERSONNEL.

⚠ AVERTISSEMENT
 TOUT CONTACT AVEC LES HAUTES TENSIONS PEUT ENTRAÎNER LA MORT OU DES BLESSURES SÉVÈRES. CE PANNEAU NE DOIT ÊTRE ENLEVÉ QUE PAR UN RÉPARATEUR QUALIFIÉ.

Notices and Compliance Declarations




⚠ WARNING
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⚠ AVERTISSEMENT
TOUT CONTACT AVEC LES HAUTES TENSIONS PEUT ENTRAÎNER LA MORT OU DES BLESSURES SÉVÈRES. CE PANNEAU NE DOIT ÊTRE ENLEVÉ QUE PAR UN RÉPARATEUR QUALIFIÉ.

⚠ WARNING
HIGH LEAKAGE CURRENT - ENSURE PROPER GROUNDING

⚠ AVERTISSEMENT
COURANT DE FUITE ÉLEVÉ — FORNIR UNE MISE À LA TERRE EFFICACE.

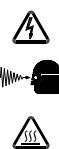



⚠ WARNING
HOT GLASS AND METAL SURFACES INSIDE. KEEP LID TIGHTLY FASTENED TO PROTECT AGAINST SKIN BURN.
FOR ACCESS, SET OVEN TEMPERATURE TO ZERO (OFF), OPEN LID, AND ALLOW TO COOL 5 MINUTES BEFORE TOUCHING GLASS TUBES OR INTERIOR METAL SURFACES.



⚠ WARNING
HOT GLASS AND METAL SURFACES INSIDE. KEEP LID TIGHTLY FASTENED TO PROTECT AGAINST SKIN BURN.
FOR ACCESS, SET OVEN TEMPERATURE TO ZERO (OFF), OPEN LID, AND ALLOW TO COOL 5 MINUTES BEFORE TOUCHING GLASS TUBES OR INTERIOR METAL SURFACES.

⚠ AVERTISSEMENT
SURFACES CHAUDES, LAISSER LE COUVERCLE HERMÉTIQUEMENT FERMÉ. POUR ACCÉDER, METTRE LA TEMPÉRATURE DU FOUR À ZÉRO, OUVRIR LE COUVERCLE ET LAISSER REFROIDIR 5 MINUTES AVANT DE TOUCHER LA VERRERIE OU TOUTE SURFACE MÉTALLIQUE INTÉRIEURE.

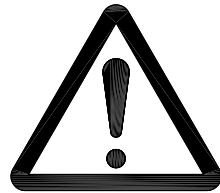
	<p>⚠ WARNING FOR CONTINUED PROTECTION AGAINST:</p> <ul style="list-style-type: none"> * ELECTRICAL SHOCK * EYE DAMAGE (UV RADIATION) * SKIN BURNS <p>KEEP COVER FASTENED WHEN POWER IS ON. ALLOW TO COOL 5 MIN. (MAIN POWER OFF) BEFORE REMOVING COVER.</p>		<p>⚠ WARNING FOR CONTINUED PROTECTION AGAINST:</p> <ul style="list-style-type: none"> * ELECTRICAL SHOCK * EYE DAMAGE (UV RADIATION) * SKIN BURNS <p>KEEP COVER FASTENED WHEN POWER IS ON. ALLOW TO COOL 5 MIN. (MAIN POWER OFF) BEFORE REMOVING COVER.</p>
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⚠ AVERTISSEMENT
POUR LA PROTECTION PERMANENTE CONTRE UN CHOC ÉLECTRIQUE, UNE BRÛLURE DES YEUX (RADIATION UV) OU DE LA PEAU, LAISSER LE COUVERCLE HERMÉTIQUEMENT FERMÉ LORSQUE L'APPAREIL EST SOUS TENSION. LAISSER REFROIDIR 5 MINUTES (APPAREIL ÉTEINT) AVANT D'ENLEVER LE COUVERCLE.

PANNEAU NE DOIT ÊTRE
ENLEVÉ QUE PAR UN
RÉPARATEUR QUALIFIÉ.

⚠ AVERTISSEMENT
COURANT DE FUITE ÉLEVÉ — Fournir une
mise à la terre efficace.

⚠ WARNING
HIGH LEAKAGE CURRENT -
ENSURE PROPER GROUNDING



Pinch point on X, Y, Z axis movement.



Attention – refer to the manual. This symbol indicates that information about usage of a feature is contained in the manual.

WARNING
If the autosampler is used in a manner not specified by CETAC Technologies, the protection provided the equipment may be impaired.

WARNING
The power switch on the rear panel is not the mains disconnect. Mains disconnect is accomplished by disconnecting the detachable power supply cord at the appliance coupler or at the mains plug. Ensure the power cord is easily accessible and removable, in the event of an emergency, which requires immediate disconnection.

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Preface

Preface

The *QuickWash Operator's Manual* explains the procedures for installing, using, and maintaining the CETAC QuickWash Accessory. It also provides information about troubleshooting QuickWash problems and describes the design of the system.

Who Should Read This Book

The primary audience for the *QuickWash Operator's Manual* consists of analytical chemists and lab technicians. To use this manual effectively, you should have a strong knowledge of chemistry, a basic knowledge of electronic sampling equipment, at least a beginning level of computer experience, and working knowledge of an inductively coupled plasma mass spectrometer (ICP-MS).

How to Use This Book

The *QuickWash Operator's Manual* contains eight chapters. You should read the chapters sequentially the first time. Thereafter, refer to the chapters separately as needed.

The *QuickWash Operator's Manual* contains the following chapters:

Chapter 1, "Introduction," provides you with an overview of the QuickWash function and design.

Chapter 2, "QuickWash Features," describes items such as wash time, rinse liquid and gas connections and coupling the ASX-112FR Autosampler.

Chapter 3, “QuickWash Installation – Manual Operation,” provides step-by-step instructions for installing the QuickWash to the Aridus II™ for manual operation.

Chapter 4, “QuickWash Installation – Automated Operation,” provides step-by-step instructions for installing the QuickWash for automated operation with the Aridus II™ and the ASX-112FR Autosampler.

Chapter 5, “QuickWash Operation Parameters,” describes suggested QuickWash parameter settings.

Chapter 6, “Maintaining the QuickWash,” explains daily, weekly, and periodic maintenance tasks.

Chapter 7, “Troubleshooting the QuickWash,” describes how to diagnose and correct minor QuickWash problems.

Chapter 8, “Specifications,” lists important QuickWash technical details such as power requirements, dimensions and weight.

Conventions Used in This Book

This book uses certain conventions to distinguish different types of information easily. This section describes these conventions.

Instructions

All step-by-step instructions are numbered and in bold type, as in the following example.

1 Mount the sample probe assembly on the cover...

Many numbered instructions are followed by more detailed explanations.

Preface

Terminology

This manual frequently uses the following terms:

QuickWash	Rapid Washout Accessory for the Aridus II™ Desolvating Nebulizer System.
ICP-MS	An Inductively Coupled Plasma Mass Spectrometer.
ASX-112FR	CETAC Autosampler.
Hz	Hertz.
ID	Inside Diameter.
OD	Outside Diameter.
LED	Light-Emitting Diode.
PEEK	Polyetheretherketone.
PFA	Perfluoroalkoxy
PTFE	Polytetrafluoroethylene.
PSI	Pounds Per Square Inch.
PVC	Polyvinyl Chloride.
Trademarks	Teflon® and Tefzel® are registered trademarks of E.I. du Pont de Nemours.
VAC	Volts Alternating Current.
VDC	Volts Direct Current
C-Flow	PFA Microconcentric Nebulizer.
Low-Flow	Sample flow-rate of approximately 100 µL/min.
Sweep Gas	Ar gas flowing counter-current to aerosol flow.

Notes

Notes contain a reminder about the effect of particular actions. Notes are indicated as follows:

Note:

This example shows how a note is displayed.

Cautions

Cautions indicate situations that require immediate attention to prevent harm to the QuickWash Accessory. Cautions are indicated as follows:

CAUTION

This example shows how a caution is displayed.

Warnings

Warnings indicate situations that could cause bodily harm. Warnings are indicated as follows:

WARNING

This example shows how a warning is displayed.

Where to Go for More Information

In addition to the *QuickWash Operator's Manual*, you can refer to the following resources:

- Software and hardware manuals for the ICP-MS instrument you are using.
- CETAC Technologies Customer Service and Support:
 - 1 (800) 369-2822 (USA only)
 - 1 (402) 733-2829
 - 1 (402) 733-1932 (Fax)
 - custserv@cetac.com

1

Introduction

Introduction

Introduction

The CETAC QuickWash Accessory is designed specifically for use with the CETAC Aridus II™ Desolvating Nebulizer System. The QuickWash enables more rapid sample washout from the Aridus II™, removing any sample components which may adhere to the Aridus II™ PFA spray chamber wall.

The QuickWash controls the flow of rinse solution and Argon gas to an auxiliary nebulizer that is built into the Aridus II™ spray chamber. The auxiliary nebulizer provides a tangential spray of rinse solution that effectively cleans the chamber walls. The QuickWash has a timer function to set the length of rinse cycle.

This cleaning is especially useful if analyte concentrations above 100µg/L are introduced, such as for isotope ratio measurements performed with Multi-Collector ICP-MS. (Ex. U-Th dating studies.)

The QuickWash may be used in a manual mode or in an automated mode with the CETAC ASX-112FR Autosampler. Mounting pins are provided so the QuickWash may be placed on either the left or right side of the Aridus II™ cabinet.

A picture of the QuickWash Accessory is given below.



CETAC QuickWash Accessory.

QuickWash Features

Features

QuickWash Features

Front View:

The front view of the QuickWash has the following features. Please refer to the detailed front view below.



QuickWash Front View.

- 1) **Power Switch:** The front power switch turns power on to the QuickWash. A green LED indicator will illuminate when the power is on.
- 2) **Manual QuickWash Switch:** The front manual switch labeled “QuickWash” can be pressed to manually start a rinse cycle. When the switch is pressed the yellow LED indicator will illuminate. (The rinse cycle may be stopped by turning off the power switch.)
- 3) **Wash Time:** The wash or rinse time may be set in 10 second increments from 10 seconds up to 160 seconds. The time selection knob can be turned so the white line corresponds to the desired time setting.
- 4) **Gas/Liquid Line:** The gas/liquid line is approximately 520mm long and comes out the top port of the front of the QuickWash. The gas/liquid line carries rinse solution and nebulizer gas to the auxiliary nebulizer port on the left side of the front of the Aridus II™ PFA spray chamber.

Side View:

Both sides of the QuickWash box have three slotted holes for mounting the box on either the left or right side of the Aridus II™ cabinet.

The operator can choose which side depending on the configuration of the host ICP-MS instrument.

A picture of the left side of the box is given below.



QuickWash Side View.

Back View:

The back view of the QuickWash has the following features. Please refer to the detailed back view below.



QuickWash Back View.

Features

- 1) **Auxiliary Power:** The auxiliary power port allows direct connection to an external 24V power supply. This external power supply is used when the QuickWash is operated in a manual mode.

Specifications for the power supply are: 24 VDC, 3.3A input, 100-200V, 47-63 Hz.

- 2) **Autosampler Control/Power:** This nine-pin connection enables both communication and power from the CETAC ASX-112FR Autosampler when the QuickWash is used in an automated mode.
- 3) **Argon Supply:** An external argon gas flow for the auxiliary nebulizer can be attached to the argon supply port. Input argon gas pressure should be from 50 to 100 pounds per square inch (psi) or 3.44 bar to 6.89 bar. A pressure of 60psi (4.13 bar) is recommended.
- 4) **Rinse and Rinse Bypass:** The rinse and rinse bypass ports each accommodate ¼" – 28 style fittings for the introduction of rinse solution to the QuickWash.

The rinse solution is typically recirculated by a peristaltic pump and is directed to the auxiliary nebulizer via the gas/liquid line on the front of the QuickWash box.

QuickWash Accessory Items

The QuickWash will be shipped with the following items:

- 1) **One QuickWash Accessory System**
- 2) **One External 24V Power Supply (no autosampler)**
- 3) **One Power Cord (no autosampler)**
- 4) **One Argon Gas Connection Kit**
- 5) **One DB9 Communication Cable (with autosampler)**
- 6) **One Rinse Solution Tubing Kit**
- 7) **One QuickWash Accessory Operator's Manual**

**QuickWash Installation – Manual
Operation**

Using the QuickWash

It is important to establish sound laboratory practices, analytical environment, and ICP-MS performance before using the QuickWash. The best performance can then be expected when these conditions are met.

Establishing Optimal Conditions

Malfunction or damage can occur if specific operating conditions are not met. Meeting these conditions requires establishing the proper laboratory environment and replacement of ICP-MS, Aridus II™, ASX-112FR and QuickWash components that wear out during normal usage. The following sections explain how to meet these conditions.

Note:

Damage or malfunction that results from unsatisfactory operating conditions may constitute misuse and abuse and can be excluded from warranty coverage.

Establishing the Laboratory Environment

To establish satisfactory operating conditions in your laboratory environment, follow these guidelines:

- **Operate the QuickWash in a conventional laboratory environment where the temperature is 50-86°F (10-30°C), the humidity is 20-70% non-condensing, and the unit is not exposed to excessive flammable or corrosive materials.**
-

- **Avoid rough handling of the QuickWash. If possible, do not expose the system to vibration or shock.**
- **Protect the QuickWash from long-term exposure to condensation, corrosive materials, solvent vapor, continual standing liquids, or large spills. Exposures of this type can damage the electronics.**
- **Observe the same general electrostatic discharge precautions as with any other integrated circuit electronic device. Low humidity environments, especially when combined with static-generating materials require maximum care.**

WARNING

Discharge static buildup and ground to the QuickWash cabinet before performing any maintenance. Do not touch or short-circuit bare contacts.

Avoid using the QuickWash if strong electromagnetic interference or radio frequency interference is present. In environments with very low humidity, high static charges may effect the stability of the analyte signal, causing a transient drop in intensity within the proximity of the charged object.

Choosing a Location

The QuickWash Accessory is designed to mount directly onto the left or right side of the Aridus II™ cabinet. At least 7.6cm (3 inches) of clearance should be allowed on either side of the Aridus II™.

Space Requirements

Dimensions for the QuickWash Accessory are 6.7cm (W) x 27.6cm (D) x 14.3cm (H). As noted above, the QuickWash is designed to attach directly to the left or right side of the Aridus II™ cabinet, depending upon the ICP-MS configuration.

Power Requirements

For manual operation, the QuickWash is powered by an external 24VDC power supply. Place the power supply within 1.2 meters of the QuickWash, and the power supply itself within 1.2 meters of the power outlet. Specifications for the power supply are 24VDC, 3.3A input, 100-240V, 47-63 Hz.

For automated operation, the QuickWash is powered by the ASX-112FR Autosampler via a DB9 cable.

QuickWash Installation – Manual Operation

For manual operation (without the ASX-112FR Autosampler) of the QuickWash with the Aridus II™ Desolvating Nebulizer System, follow the instructions below:

- 1) **Using the three locating pins, attach the QuickWash box to either the left or right side of the Aridus II™ cabinet, depending upon the configuration of the host ICP-MS instrument. (See Figure 3a.)**

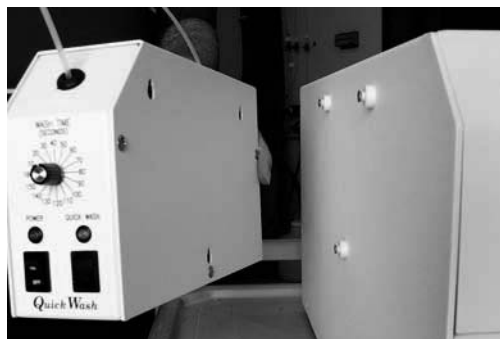


Figure 3a. Attachment of QuickWash Accessory to Aridus II™.

- 2) **Connect the rinse and rinse bypass lines to the designated ports on the back of the QuickWash box. Then connect these lines to the peristaltic pump tubing. Please remember to attach the pump tubing to the host ICP-MS peristaltic pump so the rinse solution recirculates when the QuickWash rinse cycle is off. (See Figure 3b.)**



Figure 3b. Connection of Rinse and Rinse Bypass Lines.

- 3) **Connect the argon gas line to the argon supply port on the back of the QuickWash box. The port connection is a press-fit connection, so insert the gas line into the port and push firmly until the line is secure.**
- 4) **Open the front door of the Aridus II™ System and remove the ¼" - 28 white plug from the left side of the PFA spray chamber. (Save the plug when the QuickWash is not used.) Then connect the gas/liquid line to the open port via the attached fitting. The fitting should be finger-tight. (See Figure 3c.)**

QuickWash Installation – Manual Operation



Figure 3c. Connection of Gas/Liquid Line to Spray Chamber.

- 5) Place the gas/liquid line in the slot in the upper front of the cabinet (left or right) and then close the Aridus II™ front door.
- 6) Connect the cable from the 24V power supply to the power input port on the back of the QuickWash box. Then attach the power cord to the power supply and then finally connect the power cord to the proper voltage supply. See Figure 3d for a picture of the connections to the back of the QuickWash.



Figure 3d. Connections to QuickWash Accessory – Manual Operation.

- 7) Turn on the power to the QuickWash by switching the power switch on the front of the QuickWash box. The green LED should illuminate.
- 8) Turn on the argon gas supply to the QuickWash. The gas supply can be teed from the argon gas supply for the Aridus II™ sweep gas. See Figure 4e on page 4-7. The gas pressure should be between 50 and 100psi (3.44 to 6.89 bar). A pressure of 60 psi is recommended.

**QuickWash Installation – Automated
Operation**

Using the QuickWash

It is important to establish sound laboratory practices, analytical environment, and ICP-MS performance before using the QuickWash. The best performance can then be expected when these conditions are met.

Establishing Optimal Conditions

Malfunction or damage can occur if specific operating conditions are not met. Meeting these conditions requires establishing the proper laboratory environment and replacement of ICP-MS, Aridus II™, ASX-112FR and QuickWash components that wear out during normal usage. The following sections explain how to meet these conditions.

Note:

Damage or malfunction that results from unsatisfactory operating conditions may constitute misuse and abuse and can be excluded from warranty coverage.

Establishing the Laboratory Environment

To establish satisfactory operating conditions in your laboratory environment, follow these guidelines:

- **Operate the QuickWash in a conventional laboratory environment where the temperature is 50-86°F (10-30°C), the humidity is 20-70% non-condensing; and the unit is not exposed to excessive flammable or corrosive materials.**

- **Avoid rough handling of the QuickWash. If possible, do not expose the system to vibration or shock.**
- **Protect the QuickWash from long-term exposure to condensation, corrosive materials, solvent vapor, continual standing liquids, or large spills. Exposures of this type can damage the electronics.**
- **Observe the same general electrostatic discharge precautions as with any other integrated circuit electronic device. Low humidity environments, especially when combined with static-generating materials require maximum care.**

WARNING

Discharge static buildup and ground to the QuickWash cabinet before performing any maintenance. Do not touch or short-circuit bare contacts.

Avoid using the QuickWash if strong electromagnetic interference or radio frequency interference is present. In environments with very low humidity, high static charges may effect the stability of the analyte signal, causing a transient drop in intensity within the proximity of the charged object.

Choosing a Location

The QuickWash Accessory is designed to mount directly onto the left or right side of the Aridus II™ cabinet. At least 7.6cm (3 inches) of clearance should be allowed on either side of the Aridus II™.

Space Requirements

Dimensions for the QuickWash Accessory are 6.7cm (W) x 27.6cm (D) x 14.3cm (H). As noted above, the QuickWash is designed to attach directly to the left or right side of the Aridus II™ cabinet, depending upon the ICP-MS configuration.

Power Requirements

For manual operation, the QuickWash is powered by an external 24VDC power supply. Place the power supply within 1.2 meters of the QuickWash, and the power supply itself within 1.2 meters of the power outlet. Specifications for the power supply are 24VDC, 3.3A input, 100-240V, 47-63 Hz.

For automated operation, the QuickWash is powered by the ASX-112FR Autosampler via a DB9 cable.

QuickWash Installation – Automated Operation

For automated QuickWash operation with the ASX-112FR Autosampler and the Aridus II™ Desolvating Nebulizer System, follow the instructions below:

- 1) **Using the three locating pins, attach the QuickWash box to either the left or right side of the the Aridus II™ cabinet depending upon the configuration of the host ICP-MS instrument. (See Figure 4a.)**

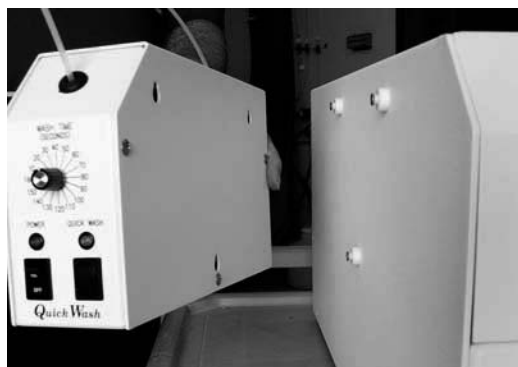


Figure 4a. Attachment of QuickWash Accessory to Aridus II™.

QuickWash Installation – Automated Operation

- 2) **Connect the rinse and rinse bypass liquid lines to the designated ports on the back of the QuickWash box. Then connect these lines to the peristaltic pump tubing. Please remember to attach the pump tubing to the host ICP-MS peristaltic pump so the rinse solution recirculates when the QuickWash rinse cycle is off. (See Figure 4b.)**



Figure 4b. Connection of Rinse and Rinse Bypass Lines.

- 3) **Connect the argon gas line to the argon supply port on the back of the QuickWash box. The port connection is a press-fit connection, so insert the gas line into the port and push firmly until the line is secure.**
- 4) **Open the front door of the Aridus II™ System and remove the ¼" – 28 white plug from the left side of the PFA spray chamber. (Save the plug when the QuickWash is not used.) Then connect the gas/liquid line to the open port via the attached fitting. The fitting should be finger-tight. (See Figure 4c.)**

QuickWash Installation – Automated Operation



Figure 4c. Connection of Gas/Liquid Line to Spray Chamber.

- 5) Place the gas/liquid line in the slot in the upper front of the cabinet (left or right) and then close the Aridus II™ front door.
- 6) Connect the male/female DB9 cable from the ASX-112FR Autosampler auxiliary I/O port to the QuickWash autosampler control/power port. See Figure 4d for a picture of the connections to the back of the QuickWash.



Figure 4d. Connections to Back of QuickWash Accessory.

- 7) Turn on power to the ASX-112FR Autosampler by switching the power on the front of the autosampler cabinet. The green LEDs should illuminate on the front of both the ASX-112FR Autosampler and the QuickWash.
- 8) Turn on the argon gas supply to the QuickWash. The gas supply can be teed from the argon supply for the Aridus II™ sweep gas. The gas pressure should be between 50 and 100 psi (3.44 to 6.89 bar). A pressure of 60 psi is recommended. See Figure 4e for a larger picture of gas and communication connections.

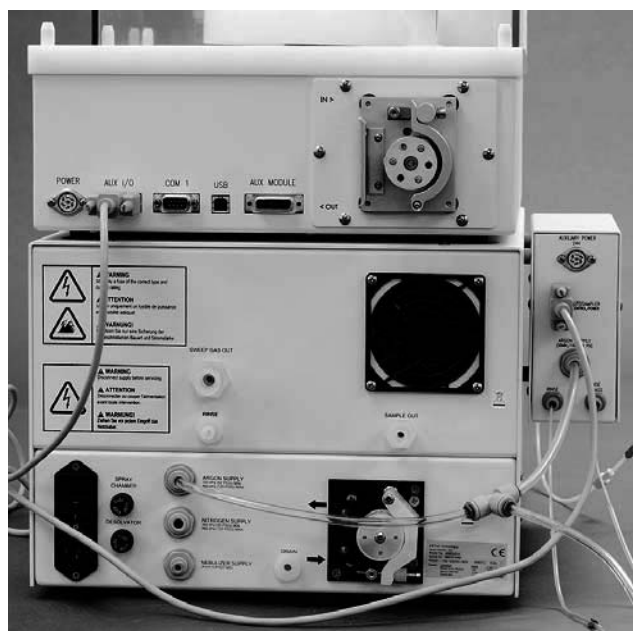


Figure 4e. Larger View of Gas/Liquid and Communication/Power Connections.

The QuickWash is now ready for automated operation.

QuickWash Accessory Operator's Manual

QuickWash Installation – Automated Operation

QuickWash Operation Parameters

QuickWash Operation Parameters

- 1) **Rinse Solution Composition:** The rinse solution used with the QuickWash can vary with the application, but a typical solution is 2% (v/v) nitric acid (HNO_3) made from a high-purity grade of concentrated nitric acid.

WARNING

Please observe any necessary safety precautions (safety glasses, gloves, laboratory coat, etc...) when handling nitric acid (HNO_3) solutions.

- 2) **Rinse Solution Uptake Rate:** The rinse solution uptake rate is usually pumped at 2mL/min.
- 3) **Rinse Cycle Time:** The rinse cycle time can be set in 10 seconds increments up to 160 seconds. Typical rinse cycle times are 30 to 60 seconds, and this can be set with the selection knob on the front of the QuickWash box.
- 4) **Auxiliary Nebulizer Gas Flow:** The auxiliary nebulizer argon gas flow is preset at the CETAC factory via a gas control unit that is internal to the QuickWash box. This gas flow is set at approximately 2L/min argon.

Maintaining the QuickWash

QuickWash Maintenance

Routine maintenance of the QuickWash consists of daily, weekly and monthly procedures for specific system components and supplies used in the accessory. Maintenance includes checking the QuickWash for liquid/gas leaks or other problems/damage.

WARNING

The QuickWash must be turned off and the DC power cord or the DB9 cable unplugged before performing any maintenance on the system.

Cleaning the QuickWash

Cleaning the QuickWash is an important task. Failure to clean the QuickWash can cause increased wear and reduce the system's operating life. It is especially important to clean up any liquid spills, particularly of any acidic solutions. Note that it may be necessary to chemically neutralize spills. The following sections explain daily external cleaning procedures.

Daily External Cleaning

Use of the QuickWash can result in liquid spills on the unit. To clean any external spills complete the following steps:

1. Shut down and disconnect the power cord or DB9 cable to the QuickWash.
2. Wipe the top and sides of the QuickWash using a towel dampened with a laboratory-grade cleaning agent.
3. Repeat step 2, using a towel dampened with clear water. This process removes any remaining contaminants.

4. Dry the cabinet of the QuickWash with a dry towel. The QuickWash must be thoroughly dry before you turn the QuickWash power on.

Replacement of Peristaltic Pump Tubing

Peristaltic pump tubing is used to direct the rinse solution to the QuickWash auxiliary nebulizer. With extended use the tubing can become worn and may leak. The tubing should be inspected after use and replaced if significant wear or stretching is observed.

Troubleshooting the QuickWash

Troubleshooting the QuickWash

The QuickWash is both easy to operate and reliable. However, problems with the system may occur. If good performance is not obtained, try to isolate the problem to determine if it originates in the ICP-MS instrument, the Aridus II™ System, the ASX-112FR Autosampler or the QuickWash.

This chapter explains how to troubleshoot QuickWash problems. If you cannot solve a problem using the steps given in this chapter, contact CETAC Technologies Customer Service and Support.

Phone: (800) 369-2822 (USA only)

(402) 733-2829

Fax: (402) 733-1932

E-Mail: custserv@cetac.com

1 Rinse Cycle Will Not Start

- If manual mode: Ensure the external 24VDC supply is on and connected to the QuickWash. Then turn on the power switch on the front of the QuickWash (green LED will illuminate).
- If automatic mode: Ensure the ASX-112FR Autosampler power is on and the DB9 cable is connected from the auxiliary I/O port of the autosampler to the autosampler control/power port on the back of the QuickWash.

2 Rinse Liquid/Gas Flow Problems

- Ensure the peristaltic pump tubing and rinse bypass lines are properly connected.
 - Check for any damage to the gas/liquid line.
-

- Ensure the gas/liquid line connection to the AridusII™ spray chamber is correct and tight.

3 Poor Washout Performance

- Check all the items above which may effect the rinse liquid/gas flow.
- Check the argon gas supply connection at the back of the QuickWash.
- Ensure the desired wash time has been set on the QuickWash.

Specifications

QuickWash Specifications:

- Voltage:
 - 24 VDC Power Supply
- Power Supply:
 - 100-240V, 3.3A input, 47-63 Hz
- Dimensions:
 - 6.7cm (W) x 27.6cm (D) x 14.3cm (H)
- Argon Gas Flow:
 - 2 L/min (factory settings)
- Weight:
 - 1.07 kg (2.35 lbs)