

The Environmental Express AutoBlock™

Operations Manual

Congratulations! By purchasing the AutoBlock, you have made the decision to fully automate metals digestions in your laboratory! It is extremely important that you read and understand this entire operating and training manual. We have attempted to make the AutoBlock as user-friendly as possible, but please take the time learn the manual. Not only are the operations of the unit affected, but warranty issues could be affected by the knowledge gained in reading, understanding and abiding by the instructions enclosed. If at any point you have questions or concerns, do not hesitate to call us at 1-800-343-5319 or email us at Info@envexp.com. We will gladly and immediately assist you.

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Section 1: Introduction

The AutoBlock has been designed specifically for your laboratory by providing safe, clean and efficient digestions. It is capable of digesting water, wastewater, soils, and other materials typically digested using hotplate chemistry.

1.1 What's Included

- One AutoBlock
- One box containing the Hewlett Packard Jornada 540 series PDA with manual and ActiveSync software CD
- One 10 Liter Carboy for drain
- One section ½" PVC drain line
- QC Sheet listing packing material and performance data
- One Power Cord
- Three Polycarbonate racks
- One 25' roll of teflon tubing (two 25' rolls for dual system)
- One blower fan and housing
- One sheet of Avery style labels
- Six zip ties
- Environmental Express Sharpie pen
- Instruction Manual
- Miscellaneous spare parts

1.2 Uncrating

Retain all packaging materials for a minimum period of 90 days.

See *Warranty* for complete details.

Your AutoBlock has been packaged in a custom crate for shipping purposes. Spend adequate time reading this instruction manual before unpacking your AutoBlock. While unpacking keep in mind there are many fragile components. A Quality Control sheet from the factory is included for your convenience. Use this list to inventory components as they are unpacked.

FOLLOW THESE INSTRUCTIONS FOR UNCRATING

1. A diagram and instructions are located on top of the crate. Follow these instructions for removing the panels on the crate. You will need a Phillips head screwdriver or drill for removal of screws.
2. Slide the assembled 3 sides and top away from the unit taking precautions not to damage any parts inside the crate
3. Remove any loose packaging material
4. Cut the plastic bands securing the AutoBlock.

Several strong backs are required to lift the AutoBlock. It is heavy. (Approx. 200 lbs.) Lift only from the bottom.

5. Lift the AutoBlock only from the bottom. Carefully place the unit on a sturdy counter with the following *minimum requirements*:
 - A. Counter must be able to withstand a minimum 300-lb. load.
 - B. Space requirements: 35-inch width, 32-inch depth and 36-inch height. These are minimum requirements. Additional bench space (if available) will make installation, service and use easier.

Residual water may be found in the internal plumbing of your AutoBlock. This includes the pump, reagent injection lines and drain lines. This water is non-hazardous, and was used for system checks during quality control inspections.

1.3 **Warranty**

The Environmental Express AutoBlock is warranted to heat, hold temperature, automatically add reagents, lift sample racks, cool samples with air flow and perform the stated functions of the PDA for a period of ONE YEAR. This one-year warranty is divided into two sections as follows:

1.3.1 **90-Day Warranty**

The 90-Day Warranty covers parts, shipping and labor costs for a period of ninety (90) days from the original ship date. This warranty applies only in the case of damage or failure caused by reasonable and normal laboratory use. The 90-Day Warranty expires 90 days after the original ship date.

1.3.2 **9-Month Warranty**

The 9-Month Warranty begins immediately following the 90-Day warranty. It covers parts and ground shipping costs for the replacement parts only. This warranty applies only in the case of damage or failure caused by reasonable and normal laboratory use. The 9-Month Warranty expires 365 days after the original ship date.

1.3.3 **Warranty Disclaimer**

Environmental Express makes no other warranty, expressed or implied. Environmental Express shall not be liable for consequential, incidental, specific or any other indirect damages resulting from economic loss or property damages sustained by any customer from use of this product.

Environmental Express does not warrant the AutoBlock against damage resulting from chemical reactions that may occur between reagents or between samples and reagents or between various liquids and components of the AutoBlock. It is the responsibility of the laboratory to verify the compatibility of the reagents, heat and time indexes, the compatibility of each sample matrix and other varying digestion method conditions prior to operation.

1.3.4 **Charges Not Covered by Warranty**

Failure to retain the Original Shipping Crate and all other packaging materials for at least 90 days could result in additional charges should repairs prove necessary.

Failure to adhere to AutoBlock maintenance instructions and requirements can void all warranties and result in damage to the AutoBlock, loss of samples, and create repair issues not covered by the Warranty. See Section 8 for maintenance instructions.

1.3.5 **How the Warranty Works**

Upon receipt of the unit it is the laboratory's responsibility to inventory all parts and immediately notify Environmental Express of any suspected defects or missing parts. If during the first 90 days following the original ship date the unit malfunctions, a telephone call to troubleshoot the issue must be initiated by the laboratory. If it is deemed by the technical staff of Environmental Express that the problem cannot be fixed by the lab, and that the failure occurred during normal and accepted laboratory operations, then a written Return Authorization form and number will be issued by Environmental Express. And the AutoBlock will be returned to Environmental Express in its original shipping container.

1.4 **Repair**

If your system requires attention beyond basic maintenance, please follow the guidelines below. Failure to do so could result in loss of warranty protection and increased charges.

1.4.1 **Repair Approval**

Any attempt by laboratory personnel to repair the AutoBlock without first obtaining Environmental Express' written consent may void all or part of the Warranty, expressed or implied. Call 1-800-343-5319 to obtain approval before beginning any repair work.

1.4.2 **In-Lab Troubleshooting & Repairs**

The AutoBlock has been engineered so that mechanically minded laboratory personnel can perform most troubleshooting, repairs and tests. Technical assistance in such circumstances is always provided over the phone (or via email, fax, etc...) by Environmental Express, whether the AutoBlock is in or out of the Warranty periods. There is no charge for this assistance. The AutoBlock is component based, making most repairs quick and painless.

1.4.3 **Repair by Manufacturer**

In the unlikely event that the unit must be returned to the manufacturer, it is the lab's responsibility to:

- A) Obtain a Return Authorization form and number
- B) Coordinate shipment and insurance with Environmental Express

- C) ***Properly pack**** the AutoBlock in ***approved materials only****
 - D) Place a Purchase Order with Environmental Express for repair
- * These elements are critical to a successful repair experience*

1.4.4 Return Packing & Shipping

It is the responsibility of the laboratory to retain in good condition the original crate and other packing material for a period no less than 90 days following receipt of the AutoBlock. If the original shipping container is not available, a new shipping container must be purchased from Environmental Express prior to shipment. Shipping charges and insurance from your lab to Environmental Express, and return shipping charges via standard trucking line will be the responsibility of the lab except for approved 90-Day Warranty claims.

1.4.5 Inspection upon Receipt

Upon receipt, Environmental Express will inspect, repair and return the unit in a timely manner, and bear associated costs covered by warranty, if any applies. However, *if it is determined by Environmental Express that the damage to the AutoBlock was caused by negligence or improper use or improper packaging/shipment, no warranty shall apply.* In such case, reasonable and customary repair charges will apply including freight and insurance costs to and from the laboratory.

1.4.6 Additional Information & Help

If you have any questions or concerns do not hesitate to pick up the phone and call 1-800-343-5319 or outside the US, 843-881-6560. Standard hours of operation are 8:30am to 5:30pm EST- Monday through Friday excluding a few holidays. You can email questions to Info@envexp.com at any point. Please include your name, company and telephone number. A technical service representative will respond as quickly as possible. This manual addresses issues normally seen in the field. Remember the PDA has many help screens for additional information.

Section 2: Installation

2.1 Preparing the AutoBlock

Follow the instructions in Section 1.2, *Uncrate the AutoBlock*.

Residual water may be found in the internal plumbing of your AutoBlock. This includes the pump, reagent injection lines and drain lines. This water is non-hazardous, and was used for system checks during quality control inspections.

2.1.1 Install Drain Line & Carboy

A) The drain line is located in the lower back portion of the AutoBlock. Route the drain line downwards. There is an open space in the base of the AutoBlock directly beneath the drain line fitting. Running the drain line through this space will protect it from accidentally becoming pinched.

B) Position the 10-liter carboy under the AutoBlock; all AutoBlock waste fluids drain by gravity. Therefore, the drain line path must continually flow downward into the carboy. Shorten the drain line as much as is reasonable while still allowing easy access to empty the container when needed. Attach the drain line to the proper fitting in the carboy cap.

Injection of DI water in the manual mode should be performed prior to use to insure the drain line and carboy are working properly.

2.1.2 Install the Exhaust Fan

Holding the fan assembly in hand, orient the 4" white vent duct towards the ceiling. Aim the 4" black intake duct towards the 4" vent hole. (The vent hole is located beneath the 5 Teflon intake ports on the right side of the AutoBlock.) Align the machined slots in the top of the fan assembly with the silver brackets above the vent hole. Slip the fan assembly machined slots onto the silver brackets. The fan assembly should lock solidly into place and self-align the blower intake duct with the vent hole. Visually inspect the black ring gasket used to seal the black fan intake pipe. Make sure that the seal is snug against the side panel of the AutoBlock. Plug the exhaust fan power cord into the receptacle located on the back panel of the AutoBlock labeled *Exhaust Fan 1*.

2.1.3 Placement of Reagent Rack

Position the six-bottle reagent rack (optional) on the right side of your AutoBlock directly beside the exhaust fan housing, preferably beside and not in front of the fan housing. (For the dual system there may be two reagent racks-optional)

2.2 Reagent Line Installation

The following steps will connect your 2.5 liter reagent bottles to the AutoBlock. These bottles are your standard 2.5L acid bottles. For the DI port use a cleaned acid bottle filled with DI.

2.2.1 Components for Reagent Uptake

(A) Inlet Ports

Inlet Ports are located (and labeled) on the right panel of the AutoBlock. These Teflon fittings attach reagent uptake lines to the AutoBlock.

(B) Teflon Nuts for Inlet Ports

The Teflon Nuts are located in the Spare Parts Bag. These nuts secure the reagent uptake lines to the ports.

(C) Vented Reagent Caps (optional)

A pack of 5 vented reagent caps, green in color. (For the dual system 10 caps are needed). Attach these to your 2.5 liter reagent bottles in the reagent rack.

(D) Reagent Uptake Lines

25 feet of small bore Teflon tubing has been included (2-25' tubing rolls for dual system). Begin by cutting this into five 5' sections. Cut each line squarely. These sections will become your reagent uptake lines.

2.2.2 Assembly of Reagent Uptake Components

(A) Loosen the nut on top of a vented reagent cap. Insert one end of a reagent uptake line through the nut until it reaches the bottom of the 2.5 liter bottle. Hand tighten the nut.

(B) From the spares box, take out one pack of 1/8" nuts and one pack of 1/8" ferrules. Please note that the nut has a threaded end and a knurled end. The ferrules consist of two pieces. The first piece is a metal ring with the edge of one end tapered and the other flat. The second piece is a stepped Teflon ring with one end a slightly larger diameter than the other.

Make sure that the end of the 1/8" Teflon reagent line that will connect to the Autoblock is cut cleanly and square. Slide onto the reagent line in the following order, one 1/8" nut knurled end first, one metal ring ferrule flat end first, and one Teflon ferrule smaller diameter first.

Next, gently push the end of the reagent line into the desired inlet port until the tubing bottoms out. Carefully slide the nut up the reagent line until it is at the port. Finally, finger tighten the nut. As the nut is tightened, it will push the ferrules along the reagent line. When the ferrules reach the end of the line, the continued tightening of the nut will push the tapered end of the metal ring ferrule over and

down onto the Teflon ferrule. This clamps the Teflon ferrule onto the reagent line and, if done properly, insures a pressure tight connection.

2.2.3 Reagents

The Reagent Inlet Ports of your AutoBlock have been initially set up in the following manner:

- Port #1: DI Water **DI Water must always be attached to Port #1.**
- Port #2: Hydrochloric Acid
- Port #3: Nitric Acid
- Port #4: Hydrogen Peroxide
- Port #5: Sulfuric Acid
- Port #6-10 for dual system only- **DI Water must always be attached to Port #6 for dual systems**

If these reagents do not suit your application, you may change them. Changing the reagents and port numbers is addressed in Chapter 6, Service Mode, Setup Section.

2.3 Install the AutoBlock

This is an easy process but be careful to follow these steps to insure proper function of the unit. The rear panel of your AutoBlock should continue to remain accessible during this section.

- 2.3.1 Power Cord-The AutoBlock includes a 6' power cord. Power requirements are standard 115VAC 12amp US and Canada, 220VAC 6amp International. Plug the power cord into the rear panel port labeled *POWER IN*, and plug into a standard outlet. If the power line must be extended beyond 6', the use of an extension cord with the appropriate minimum electrical and safety standards may be used.
- 2.3.2 Remove the PDA from the box. Place it in the AutoBlock PDA cradle facing forward, aligning the gold plated pins. The PDA cradle is mounted permanently on the right side of the AutoBlock.
- 2.3.3 Attach the cord originating in the PDA cradle to the serial port labeled *RS 232* on the rear panel.
- 2.3.4 The PDA Power Cable is located in the HP Jornada PDA box. It has a 2-prong plug and a black AC/DC adapter box. Plug this into the rear panel of the AutoBlock in the receptacle labeled *PDA*.
- 2.3.5 There is a second cord in the PDA box. It is 4.5' in length. One end of this cord has 2 gold tabs; the other end is an "L" shaped plug. Attach this cord into the pigtail coming from the RS 232 cable, and attach the "L" shaped plug into the AC/DC adapter box. (Note: some of these cables may already be assembled by the PDA manufacturer) When the PDA is place on the cradle a light should illuminate on the top of the PDA. Red means the PDA is charging, Green is the batteries are fully charged. If no light appears check all connections making sure

they are attached properly. Software may be lost if the batteries become fully discharged.

- 2.3.6 All electrical connections have now been made. Using zip ties provided, position all wires out of harm's way. Be sure none of the electrical components hang near the drain line, or lie upon the counter top where acid spills may occur.
- 2.3.7 Install 4" diameter acid-resistant duct to the exhaust fan assembly outlet. Secure with an acid-resistant clamp. Be careful not to impede access to the inlet lines located above the outlet. PVC dryer hose/pipe can be used, although accordion-like tubing will decrease the velocity of the airflow. Vent to the outside of the lab building or plumb into existing ductwork. The length of your duct run should not exceed 25 feet. An additional exhaust fan must be installed if the 4" duct run exceeds 25 linear feet. Additional fans are available from Environmental Express.

Note: If the ductwork is located in a straight line above the AutoBlock two 90 degree bends should be made with a water trap installed. This should also decrease the chance for anything falling directly into the squirrel cage of the fan. Environmental Express is not responsible for acid liquid build-up or particles from ductwork that may fall into the exhaust housing causing failure.

2.4 **Air Intake Option**

You may plumb the 4" white air-intake stub located on the upper rear panel of the AutoBlock for make-up air. Do not exceed 25 linear feet without adding a second exhaust fan. This step is optional.

- 2.5 Taking care not to damage the feet of your AutoBlock, lift – do not slide – the unit into the position needed for operation.

Section 3: Supplies

3.1 Digestion supplies

Following are the supplies needed for day-to-day operation of the AutoBlock. See Section 11 for more catalog numbers and pricing.

3.1.1 Digestion cups

For most environmental samples (sample temp of <120° Celsius) AutoBlock must use the #SC475 (500pk) single-use plastic cup. This is a screw cap cup that is accurately graduated and lot certified for background metals.

3.1.2 Reflux Caps™

Reflux caps are designed to aid in reflux while still allowing the AutoBlock to dispense reagents into the samples. Laboratory tests have shown that the reflux cap performs equally to a classical ribbed watch glass. Cat # SC506, 1000pk.

3.1.3 FilterMate™

The FilterMate is a single-use Teflon filter assembly with a single-use push rod. This innovative filter is used with the sample digestion cup after digestion.

#SC0401, 100pk, 2 micron.

#SC0408, 100pk, 2 micron- Low Trace Metals- Certified

3.1.4 Digestion/Transport Racks

The AutoBlock includes three of these 18-place, polycarbonate racks. #SC864, each.

3.1.5 Storage Racks

Two styles of storage racks are stocked by Environmental Express for the SC475 cup: the SC700 foam rack (5 pk) with 25 sample capacity per rack, and the SC446 plastic rack (each), 24-cup capacity.

3.2 Maintenance Supplies

These supplies are needed to properly maintain your AutoBlock.

3.2.1 HEPA Filter Replacement

Your AutoBlock will *automatically* remind you when to change the HEPA filter. It installs in minutes and has a 99.9% capture rate of particles 0.3mm or larger. Catalogue #SC868, each.

3.2.2 Peristaltic Pump Tube

Long lasting and flexible PTFE tubing is inert to all routine digestion reagents, and has a rated life of 1,500 hours or 12 months. Your AutoBlock will *automatically* remind you when to change the tubing. Catalogue #SC866, each.

3.2.3 Reagent Injection Kit

Tubing Assembly from Splitter to Sample Cups, 6 lines. # SC875, 1 kit. Should be replaced at least annually.

3.2.4 Reagent Uptake Line

25 feet of reagent uptake line, enough for five bottle-to-inlet lines. #SC874, 25'. Should be replaced annually.

3.2.5 General Repairs

See section 1.4.

Section 4: The PDA



Your PDA (Personal Digital Assistant) is a top-of-the-line pocket PC. It is Windows CE based with specially designed software built exclusively for your Environmental Express AutoBlock.

4.1 The Basics of your PDA

The Jornada 540 is similar to most pocket PC's. To activate a function, simply touch the corresponding portion of the screen with the stylus. (The stylus is the pencil-like plastic piece located in the cover of the PDA.)

We recommend you purchase plastic coverings for the PDA screen to increase screen life. They can be purchased from Hewlett Packard by calling 1-888-999-4747 or online at www.hpshopping.com. The part number is F1827A, pack of 6. Environmental Express has included two protective covers with your system.

4.1.1 Executing Commands

A command or function is performed when the stylus is pressed on the screen. It is not necessary to push very hard. This could damage the screen. Please read the Jornada manual to acquaint yourself with its basic operations.

4.1.2 Operating the Keypad

When operating the AutoBlock with the PDA, you will use the keypad function to select reagents, reagent volumes, digestion temperatures, to name methods and perform other functions as needed. The PDA keypad operates in a fashion similar to your PC keyboard, and is used in a manner similar to typing. Pressing the small keyboard icon at the very bottom right corner of the screen brings up the keypad for use. Then use the stylus to select numbers or letters, etc... one at a

time. To close this function, repress the same small keypad icon at the bottom of the screen. The keypad function will drop from sight until selected again.

4.2 **Loading the *AutoBlock.vb* program**

Make sure the PDA is securely fitted into the PDA cradle on the left side of the AutoBlock. Turn the AutoBlock *ON* by manipulating the *Power* switch located on the rear panel.

4.2.1 **Start**

To start the PDA simply press -- using the stylus -- the black power button on the bottom beneath the word *Jornada*. In the upper left-hand corner of the screen (the MS Windows logo), press the *HP Home* menu, and the *START* menu will pop up. Press *PROGRAMS*, then *AutoBlock* (*older versions may say ahh*). Allow a few seconds for the program to load. Do not press *AutoBlock*. more than once.

4.2.3 **Can't find *AutoBlock* ?**

If you accidentally press the wrong program icons and seem to lose *AutoBlock*, press the hard plastic, black and white *home* button on the very bottom left of the PDA (it looks like a house). Then click the program switcher on the screen (right



bottom, see picture →).

You will see all current programs loaded. Just touch the *AutoBlock* line.

If you still cannot find AutoBlock then the chances are good the battery went completely dead at some point and your software must be re-installed.

Note: When the PDA is being charged properly a light will appear on the very top of top of the PDA. Red is charging, GREEN is batteries completely charged and if not illuminated there is no charge. Battery failure will cause the AutoBlock software to disappear.

4.2.4 ***Re-installing AutoBlock Software***

(A) Close all PDA applications. Press the hard plastic, black and white *home* button on the very bottom left of the PDA (it looks like a house). Then click



the program switcher on the screen (right bottom, see picture →).

You will see all current programs open. Press "Close Window" and "Close All".

(B) Install Microsoft Active Sync (if not already installed on your PC), and establish a connection between the PC and PDA. To do this, attach the PDA with included cord to serial port on PC. If prompted to establish a partnership,

cancel the prompt or click "NO". (If your Active Sync CD has been lost, go to <http://www.microsoft.com/downloads> to install the latest version.

- (C) Open Windows Explorer on your PC. (Press "Start", "Programs", "Windows Explorers". Or "Start, Programs, Accessories, Windows Explorer for MS 2000 and higher).
- (D) Insert the AutoBlock CD into the drive. You may install the program directly from the CD, but if you wish to maintain a copy of the AutoBlock program on your hard drive, drag and drop the entire Disk directory from the CD to the desired location on your PC.
- (F) To install the AutoBlock software directly from the CD, locate the AutoBlock software on the CD. You may, alternatively, locate it on your hard drive if you transferred it there in step (D), above. Double-click "AutoBlock Install, CD1 and then SETUP." Follow the PC screen prompts, until prompted to check for a PDA screen prompt.
- (G) Press "Yes to all" the prompts on the PDA. Disconnect and the software re-installation is complete. Go to section 4.2.1 to start the AutoBlock software.

Note: If you receive an update via email, AutoBlock may have a different extension other than AutoBlock.vb. If so, rename the file AutoBlock.vb prior to installing on the PDA.

4.3 **Overview of *AutoBlock* software.**

Modes and mode properties listed in Section 4.3 are addressed in depth in later sections. What follows is an overview.

AutoBlock software incorporates three modes for operation. They are:

- A) Method mode
- B) Manual mode
- C) Service mode (which includes Reagent setup, Maintenance, Temperature Calibration and a special options section)

To switch between these modes, press the *Select Mode* box at the bottom of the screen with the stylus.

4.3.1 **Mode Similarities**

All THREE modes of **the AutoBlock software** have the following properties in common:

A) Graphite Temperature

Graphite Temperature is displayed in the upper left-hand corner. All temperature readings are in Celsius. If no temperature is displayed there is no communications between the AutoBlock and the PDA.

B) Status

Status is seen in the upper right hand corner of each mode screen. It is designed to inform the analyst of functions currently being performed. Some of the functions displayed are as follows:

- 1) *No Comms*- this stands for “no communications”
- 2) *Not initialized*- appears when the unit is turned on
- 3) *Homing*- appears when AutoBlock is initializing
- 4) *Idle*- no operations being performed at this time
- 5) *Running method*- a digestion procedure is running and the unit should remain untouched while this is displayed. Only the *Abort* button is active at this point.
- 6) *Injecting*- when the AutoBlock is dispensing reagents
- 7) *Temp Reset OK*- appears briefly when the PDA acknowledges that the temperature has been reset as commanded.

C) Initialize

Initialize appears at the bottom left corner. This function sends the AutoBlock to the *HOME* position.

D) Select Mode

Select Mode appears in the bottom middle section of the screen in each mode. Pressing this switches you between the 4 different modes of operation.

E) Abort

The Abort box is a constant in the lower right hand corner. It is used when the AutoBlock needs to be unexpectedly or emergency stopped.

F) Blacked-out screen

When the PDA is not in the cradle, the screen may go black from lack of use. When this happens simply press the black power button beneath the word *Jornada*. If you touch the screen when the screen is black instead of the power button, you may accidentally activate an unwanted program or function.

4.4 Initialization

This function causes your AutoBlock to find the *HOME* position. The AutoBlock then automatically resets reference positions and synchronizes settings. Upon initialization the elevators raise and lower, and the injection arm moves to the left drain position.

Your AutoBlock must be initialized when power to the unit is first established and any time the main power is cut. Initialization does not have to reoccur when the PDA is removed from the PDA cradle as long as the AutoBlock remains

powered. For proper maintenance, **initialize daily**. Initialization only takes a few moments and the benefits are worthwhile.

To initialize your AutoBlock press the *initialize* button. The status box at the upper right hand corner will display *homimg*. When the initialization process is complete, *idle* will appear in that box. You are now ready to begin your digestion procedure.

4.5 **Software updates**

Software modifications and updates may be released at future dates. A valid email address for updates must be given to Environmental Express at Info@envexp.com to receive the software updates automatically.

4.6 **Connecting the PDA to a PC**

The following instructions show you how to install updated AutoBlock software when it is delivered via email.

(A) Install Microsoft Active Sync- this CD is included with the packet in the PDA. Follow the manufacturer's instructions for installation. (If your Active Sync CD has been misplaced go to <http://www.microsoft.com/downloads>

(B) Save the file labeled AutoBlock.vb from the email from Environmental Express. It must be saved in a file labeled AutoBlock.vb to download correctly to the PDA. Files may be emailed in a format that is not compatible with the PDA to allow the email to go through Internet firewalls. The extension for AutoBlock software must be vb. (AutoBlock.vb).

(C) Connect the serial port cable provided to a computer and connect that to the PDA at the bottom (the PDA must be removed from the cradle for this operation).

(D) Close all PDA applications. Press the hard plastic, black and white *home* button on the very bottom left of the PDA (it looks like a house). Then click



the program switcher on the screen (right bottom, see picture →).

You will see all current programs open. Press "Close Window" and "Close All".

(E) On the computer, double click on Microsoft Active Sync and click "File", "Get Connected" and "Next". This will create an association between the computer and the PDA via the Com port.

NOTE: If the program asks, "*Want to Create a Partnership*", press *No!*

(F) Press "Explore" once, double-click "My Pocket PC", "Program Files", and "AutoBlock".

- (G) Open Windows Explorer. On the computer Press “Start”, “Programs”, and “Windows Explorer”.
- (H) Locate the saved email *AutoBlock.vb*, and drag it to *AutoBlock* in Microsoft Active Sync window. Organizing individual windows to make them small will help make this easy. Having Explorer on one side and Active Sync on the other will make the drag and drop simpler.

Note: Some email systems will not accept programs ending in vb. If we have sent a file and it was labeled as vb, contact Environmental Express at info@envexp.com and we will rename it to go through your system. Once received simply rename the update and end it with .vb.

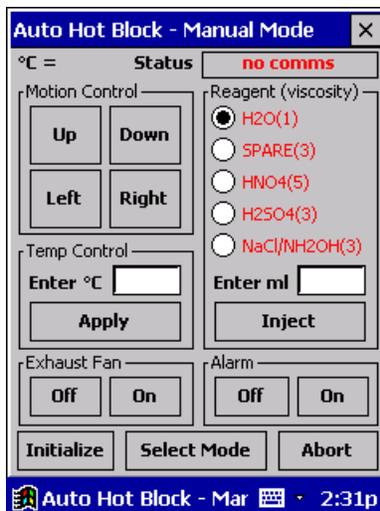
- (I) Overwrite the existing file when a newer version is to be installed.
- (J) Disconnect the PDA and return it to the AutoBlock.

4.6- Using the AutoBlock with a PC

The AutoBlock can be connected to a PC or laptop in the event of a PDA failure. Software is located on your CD or must be obtained from Environmental Express (no charge). This software can be emailed as AutoBlockPC Install.exe___. When saving the attachment take out the dashes on the extension when saving to the PC. Open the folder labeled AutoBlockPC Install.exe. This should automate the installation program and guide through the process. When using the AutoBlock with a PC a cable must be obtained. It needs to be a Female-Female Null Modem cable. If one end is not correct (meaning it is a serial cable) attach a Null Modem gender changer to the cable. Attach the PC or laptop to the RS-232 port on the back of the AutoBlock. AutoBlockPC works just as the PDA software. Manipulation must be via the mouse versus the stylus. Keyboard entry is not allowed.

Section 5: Manual Mode

The manual mode is just what the name implies. In this mode digestion functions (heating, cooling, raising/lowering elevators, injecting reagents, etc...) are performed individually by the analyst. The manual mode is used in method development, troubleshooting and on-going inspections, and other situations where hands-on control of operations is required.



Manual Mode Screen

5.1 Motion Controls

You must *Initialize* the AutoBlock before using the motion controls.

Up/Down

Causes the elevators to raise or lower.

Right/Left

Moves the dispensing arm one column Left or Right. This includes to or from the drain stations.

5.2 Reagent Addition

In the Manual mode you will see FIVE preinstalled reagents listed in the *Reagent Box*. The **Port number next to the reagent must correspond to the inlet line attached to the corresponding reagent bottle**. If this is incorrect, wrong reagents will be added to samples. (For the dual system, press the “Next” button to choose reagents 6-10).

Example: the H2O bottle must be attached via reagent uptake line to Port #1, AND H2O must be listed in the reagent box as using Port #1.

5.2.1 Purging and Prepping

In the Manual mode, injecting reagents does not include *purging* the previous reagent. Further, it does not include *prepping* with the new reagent, both of which are important steps. Following are the steps for *purging* and *prepping*.

A) Purging

Purging is the process of flushing the lines of the previous reagent with DI water.

Note: Always Purge with DI Water only!

- 1) Move the dispensing arm to a drain station
- 2) Select Reagent; H₂O (Port #1)
- 3) Enter 3 in the *Enter ml* box via the keypad function (see paragraph 4.1.2)
- 4) Press *Inject*

B) Prepping

Prepping is the process of removing the DI water from the lines with the reagent to be injected into the samples.

- 1) Move the reagent dispensing arm to a drain station
- 2) Select reagent/port #
- 3) Enter 2 in the *Enter ml* box via the keypad function (see paragraph 4.1.2)
- 4) Press *Inject*

Following *purging* and *prepping*, the AutoBlock is now ready to inject the prepped reagent into the samples.

Note: In the *Method mode*, *purging* and *prepping* are automated features, and do not need to be taken into account when designing a new method.

5.2.2 Reagent Injection

Note 1: For safety and cooling purposes, fully load the AutoBlock with 54 cups.

Note 2: Prior to adding reagents to cups, follow *Purge and Prep* procedures in section 5.2.1.

- A) Using left/right motion control, move the injection arm to the desired column of samples.
- B) Double-check that the correct *Port #/reagent* has been *Prepped* prior to injection.
- C) Enter the desired volume in the *Enter ml* box via the keypad function. Reagent addition occurs in multiples of six. The *Enter ml* volume entered will apply to each cup in each column.

Note: Acceptable volume range is 0.1ml to 50.0ml. Volumes can be entered in 0.1ml increments.

Example: 2 (or 2.0) in the *Enter ml* box = 2mls per cup

- D) Press *Inject*. You have now injected the prepped reagent at the selected volume into the selected column of sample cups.
- E) By moving the reagent injection arm to another column and pressing *Inject*, you can duplicate steps A through D.
- F) If a secondary reagent is to be added to the sample cups, *Purge* and *Prep* procedures (see 5.2.1) are **required** prior to addition of secondary reagent(s).
- G) Once reagent addition is completed, *Purging* with DI Water is **required** (see 5.2.1.) *Purging* reduces the chance of plumbing contamination and lengthens the life of all wetted parts.

5.3 **Temperature Control**

Enter the temperature needed into the *temp control* box, and press *apply*. (See *Operating the Keypad*, if you are not sure how to do this.) Temp range is ambient to 130 degrees Celsius. Variable temperatures A & B can also be entered for heating. (See Section 8.1 (F) for additional details).

Application Note: *Understanding AutoBlock Temperature*

To successfully operate the AutoBlock, a firm handle on AutoBlock Temperature is required. Please spend the time necessary to learn this information.

Definitions

Graphite temperature

- A) This refers to *the actual temperature of the graphite block* that holds the digestion cups. This temperature is continually displayed in the upper left-hand corner of the screen.
- B) **Set Point temperature**
This is the desired temperature of the graphite. The set point temperature can be programmed in the manual mode.
- C) **Sample temperature Calibration**
Sample temperature is *the actual temperature of the sample* inside the digestion cup. Temperature calibration is the process of adjusting the *Set Point temperature* until an acceptable *Sample temperature* is achieved. Temperature calibration is performed when the AutoBlock is initially set up in

the laboratory and when new methods are developed. It is also performed as part of routine maintenance.

Sample Temperature

1. To perform temperature calibration, allow the AutoBlock to heat until *Graphite temperature* stabilizes within one degree of *Set Point temperature*.
2. Measure *Sample temperature* with a NIST traceable thermometer by taking *Sample temperature* measurements from 8 variously located samples, then average. The resulting number is your actual *Sample temperature*.

Note: Use extreme caution if a mercury-containing thermometer is used. A broken thermometer may cause permanent and irreversible contamination to the AutoBlock.

3. Based on the difference (if any) between the current actual *Sample temperature* and your desired *Sample temperature*, adjust the *Set Point temp* accordingly.
4. When *Graphite temp* reaches the new, adjusted *Set Point temp*, re-measure *Sample temp*, and then re-adjust *Set Point temp* as needed.
5. Continue this four-step process until an acceptable *Sample temperature* is achieved.

5.4 Exhaust Fan

The *Exhaust Fan* box is located in the lower left portion of the screen. Pressing *On* turn the fan on, and *Off* turns the fan off.

When Graphite temp reaches 40°C in the manual mode, the Exhaust Fan automatically turns *On* as a safety precaution.

Once the fan is *On*, whether started manually or automatically, it will not end operation until

- (1) the graphite temp cools below 40°C, and
- (2) the analyst manually presses the *Off* button.

In the event that noxious fumes or vapors are present and the exhaust fan is *Off*, turn the exhaust fan *On*. See Service Mode (options section) for fan speed during digestion procedures.

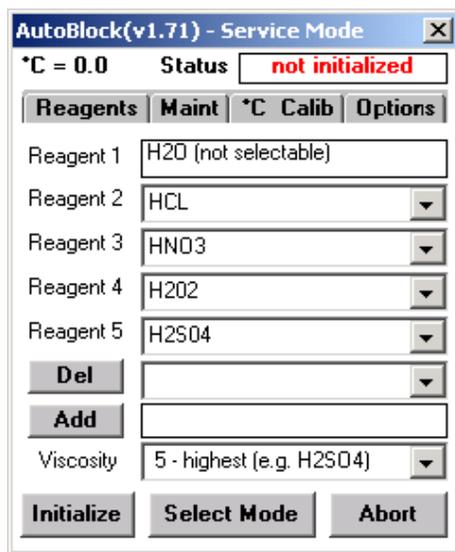
5.5 **Alarm**

In the manual mode the alarm function can turn off the alarms. In addition, you can test to insure the alarm function is working properly by turning it “ON”. An example of an alarm that would need to be turned off is when the AutoBlock software is running, but the PDA is not connected.

Note: Do not turn alarms off when the PDA is attached to the AutoBlock. This would indicate that an error has occurred.

Section 6: Service Mode

The Service mode is broken into Four individual sections. To enter the Service mode tap “Select Mode” at the bottom of the screen. Choose one of the tabs at the top of the screen to enter the appropriate section. These tabs include Reagents, Maintenance, Temperature Calibration, and Special Options.



Service Mode

6.1 Reagent Setup

Click the reagent tab at the top to enter the Reagent Setup Menu.

Reagent 1 is not selectable. It must always be DI Water. If the other reagents do not suit your application, press the drop down arrow on the right to choose the appropriate reagent.

If the reagent is not listed, see below section.

NOTE: Reagents listed in box must correspond to the reagent inlet port on the right side of the AutoBlock.

Reagents have been assigned a *viscosity rating*. This rating controls the pumping speed in which each reagent is delivered. We have engineered this to maximize efficiency and provide volume delivery accuracy.

Your **AutoBlock** software has been configured with a list of common digestion reagents and their AutoBlock *viscosity ratings*. See below:

<u>Reagent</u>	<u>AutoBlock</u> <u>Viscosity Rating</u>
1. DI Water- #1 (cannot be changed)	1
2. HCL- Hydrochloric Acid	2
3. HNO3- Nitric Acid	3
4. H2O2- Hydrogen Peroxide 30%	3
5. H2SO4-Sulfuric Acid	5
6. KMnO4- Potassium Permanganate	2
7. NaCl/NH2OH	2

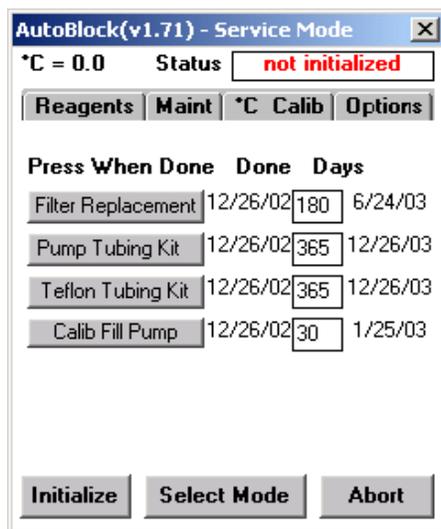
Adding and Deleting reagents

If your digestion method(s) require reagents not found on this list, use the keypad function and type them into the “Add” box, then press “Add”. Choose an appropriate viscosity rating for the newly added reagent. Click the arrow button on the box labeled Viscosity (examples are given). Selecting the proper viscosity rating is important if accurate volumes are to be delivered. If the viscosity of your new reagent is not similar to any of the listed and rated reagents, the default setting is 5 (Slowest).

To delete a reagent from the list, press the arrow to the right of the “Del” (delete) box, choose the reagent, and press *delete*. A maximum of 10 reagents can be on the list at one time. If the chart is full, a reagent must be deleted prior to adding another.

6.2 Maintenance Section

The maintenance section is designed to remind the analyst when it is time for the replacement of parts or the calibration of processes.



Maintenance mode

Failure to adhere to AutoBlock maintenance instructions and/or requirements can void all warranties and result in damage to the AutoBlock, loss of samples and/or losses not covered by the Warranty. See warranty, section 1.3.

Maintenance Indicators

Two weeks prior to the date part(s) require replacement, the PDA will issue a notice of such. This will give the analyst ample time to schedule the required maintenance, and receive delivery of replacement parts if necessary. Upon completion of the necessary maintenance, click the box of the corresponding item. A message verifies that the step was actually taken.

For warranty purposes and repair issues, Environmental Express tracks all replacement parts by the serial number of the corresponding AutoBlock.

Note: Upon initial installation, check the “Done” column. That date should correspond closely to the date of installation. If not simply press and acknowledge each maintenance item.

(A) [HEPA Filter Replacement](#)

The HEPA Filter installed in the top of the unit has under normal operating conditions, a life expectancy of 12 months. The PDA will prompt the analyst to change and acknowledge the replacement of this filter. Failure to replace the filter at this interval may void any warranty written or implied. Catalogue # for the HEPA filter is SC868.

(B) [Injection Arm Tubing Kit](#)

This kit supplies the tubing and connection fittings for the lines going from the 6-way splitter to the injection arm. These tubes should be replaced every 12 months under normal conditions. Prior to installing these lines, back flush the splitter using a syringe and DI water. Allow 1 to 2 hours to complete this task of replacement.

(C) [Peristaltic pump tube](#)

The Teflon Tube in the peristaltic pump should be replaced once a year. This frequency may need to be increased due to excessive or continuous use of concentrated acids. When the unit is operating, the pump is designed to automatically rotate forward and backward slightly to increase the life of the tubing.

(D) [Electronic Cooling Filter](#)

The small black air-intake filter located on the back panel keeps large amounts of dust from depositing on the electronics located in the rear of the AutoBlock. Should this become clogged with dust, costly electronic components can overheat or be damaged by acid vapors. To clean, remove the shroud, then wash and dry. Return the filter after it has completely

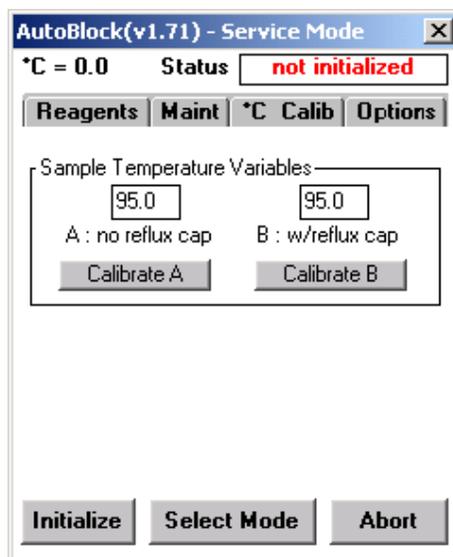
dried. Check this filter after the first 90 days of operation, then schedule routine cleaning as necessary.

(E) **Reagent pump calibration**

The default setting for the volume calibration reminder is once every 30 days; although you may decide to shorten or lengthen this period. To change the frequency of the calibration reminder, press the stylus in the days box, then enter the new number of days between calibrations. (Dual systems have two pumps and both should be calibrated.)

1. GO TO THE MANUAL MODE
2. With the elevators down, place rows of pre-weighed cups into the AutoBlock. You must have multiples of 6 starting from left to right.
3. Prep the injection arm with DI into the drain. Use 3ml DI.
4. Raise the elevators. Align the injection arm to the first row and inject 10ml of DI water. Repeat as necessary.
5. Re-Weigh all cups and average the results.
6. GO TO THE SERVICE MODE.
7. Select the maintenance tab, select calibrate fill pump. (Dual systems have two pumps.)
8. In the box labeled “injected ml”, type 10. If you used an alternative volume place that volume in the box.
9. In the box labeled “resulting ml”, type in your averaged volume.
10. Press apply. Your AutoBlock pump should now be calibrated.

Note: To insure accuracy go back to the manual mode and test appropriate volumes for injections. Repeat calibration as necessary until an acceptable range is achieved. Factory calibration is +/- 2% at 10ml.



Calibration Menu

6.3 Calibration of Sample Temperatures *Variable A* and *Variable B*

Introduction and Overview

Variable A and *Variable B* are selectable, preset sample digestion temperatures. These two sample digestion temperatures are used in all factory-installed digestion methods, and if desired, can be selected for use in all custom/lab-designed methods.

Most environmental methods require a sample digestion temperature of 95°C ± 2°. *Variable A* temperature is designed to yield a sample temperature of 95° ± 2° C when the samples are digested in an open vessel, such as most waters are.

Variable B temperature is also designed to yield a sample temperature of 95° ± 2° C when the samples are digested in a vessel with a reflux device (#SC506 Reflux Caps), such as most soils are.

Your AutoBlock's *Variable A* and *Variable B* have been individually factory calibrated to 95.0° C with a tap water matrix. 95.0° appears in the two boxes on the PDA screen in the maintenance mode, temperature calibration screen.

Note: If the custom method(s) you choose to run does not include *Variable A* or *Variable B* sample temperatures, see Section 5.3 of this manual. Section 5.3 explains setting sample temperatures in individual, custom methods.

(1) Changing *Variable A* and/or *Variable B* Temperature

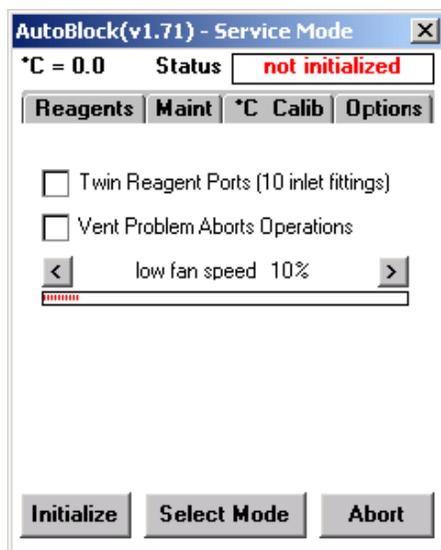
To change *Variable A* and *Variable B* from 95.0° to a different temperature, simply select the appropriate box, then type in the desired temperature.

(2) Calibrating *Variable A* and *Variable B*

- A. With the PDA on the cradle communicating with the AutoBlock, go to the maintenance mode.
- B. Make sure the *Variable A* and *Variable B* boxes have the correct temperature. 95.0° C is the default temperature.
- C. Select the *Variable* you want to check by pressing either “Calibrate A” or “Calibrate B”.
- D. After the screen automatically changes, Press “Heat to A” or “Heat to B” as appropriate.
- E. Randomly position 8 digestion cups with 50ml of reagent blanks into your 3 AutoBlock sample racks, then place the racks into the AutoBlock in the Down Position..
- F. Measure the temperature of the samples 15 minutes after the temperature displayed in the top left corner of the PDA screen reaches the desired temperature. It is recommended to use a digital thermometer (#SC980) capable of reading +/- 0.1 ° C.

Note: Suspend the thermometer in the cup to take the liquid temperature. If the thermometer rests on the bottom of the cup, the resulting temperature will be higher than the actual sample temperature.

- G. After measuring temperatures, average the results of the 8 temperatures.
- H. If the averaged temperature is in range, press “Cancel”. Calibration is completed and you will automatically return to Maintenance Mode.
- I. If the average temperature is out of range for your method(s) proceed to the next step.
- J. Type your Averaged Temperature result (example: 91.2° C = 91.2) as a simple number into the box labeled “Resulting ° C”. Be sure to round to the nearest tenth of a degree.
- K. Press “Apply”. Your AutoBlock will automatically re-calibrate *Variable A* or *Variable B* as appropriate, and then return to the Maintenance Mode.



Options Menu

6.4 Options

This section allows the analyst to change the AutoBlock from a single pump system, to a dual pump system. Click the appropriate box.

“Vent problem Aborts Operations” the AutoBlock is equipped with a pressure sensor that detects an increase in pressure when either the door is opened or the exhaust system fails. When this box is clicked, digestion methods are aborted when the pressure sensor detects one of these parameters.

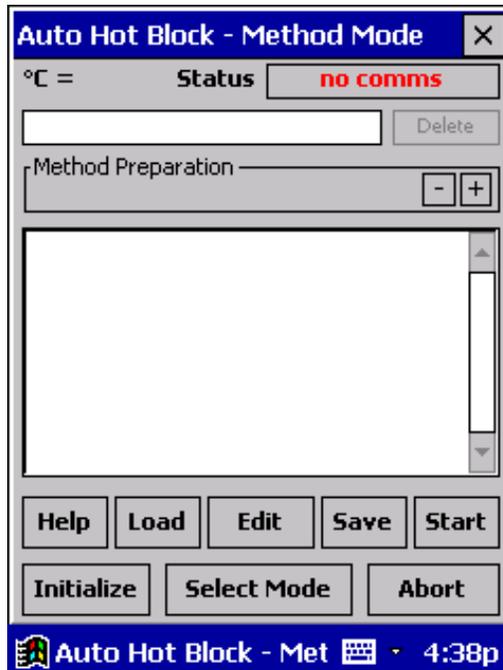
Low Fan Speed- during a digestion, the exhaust system lowers the fan speed to achieve acceptable temperature uniformity. If condensation occurs during a digestion increase the percentage of the fan speed. This should be performed using DI water with 54-Samples prior to sample digestion with acids.

Routine Cleaning

General maintenance should include a thorough cleaning of all interior plastic parts with a soft damp cloth to remove acid buildup and other contaminants that will form deposits over time. Exterior cleaning should be performed on an as-needed basis. The more frequently your AutoBlock is cleaned of residual acid, dust and other buildup, the less chance of sample contamination you will face.

Section 7: Method Mode

The Method Mode is the first mode screen to appear when the AutoBlock software is activated. It is the control center for selecting, writing and performing digestion methods. There are two ways to run a digestion method. One is a pre-programmed EPA Method, see section 7.2. The other is by creating a “Custom Method”, see section 7.6.



Method Mode

Numerous features apply to all methods whether preinstalled by Environmental Express or custom designed by the laboratory. See section 7.5.2 for a listing of major features.

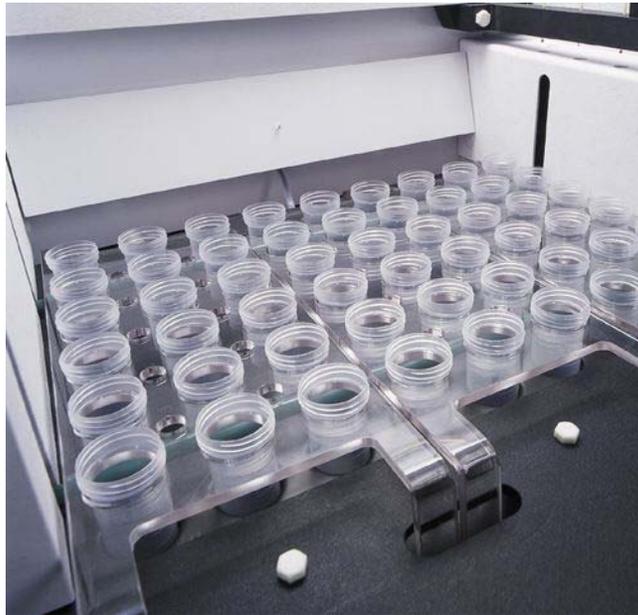
It is the responsibility of the laboratory to verify the compatibility of reagents, heat and time indexes, the compatibility of each sample matrix and other varying digestion method conditions prior to operation. (See Warranty, section 1.3.)

7.1 Loading Samples

- A) Make sure elevators are in the *DOWN* position. (Initialize if this is the first operation on the AutoBlock- section 4.4)
- B) Fill SC475 digestion cups with samples to be digested.
- C) Each SC864 digestion rack holds 18 samples configured as *3 columns of 6* cups. Beginning with the *column* that will locate at the far-left of the

AutoBlock, place your samples into the racks, loading the columns left to right. Do not skip any spaces in the columns. Fill each column completely with SIX samples before moving to the next.

- D) The final column containing samples does not have to be filled with samples; however, it *must* be filled with cups, even if the cups are empty.
- E) Fill *all* remaining open positions with empty cups, and place all **THREE** racks into the AutoBlock. Keep in mind to place the racks into the AutoBlock so that the samples begin with the far-left column.



- F) After loading all samples in columns of six from left to right, place empty SC475 cups into all remaining rack positions. All three racks *must be* completely filled either with samples or with empty cups. A total of 54 cups -- all three racks, all 54 positions -- must be in the AutoBlock *before* starting a digestion method.

Loading all 54 positions will insure proper cooling of samples due to airflow. Also, it will insure that if the final column is partially filled with samples, reagents will not accidentally dispense into empty heating wells.

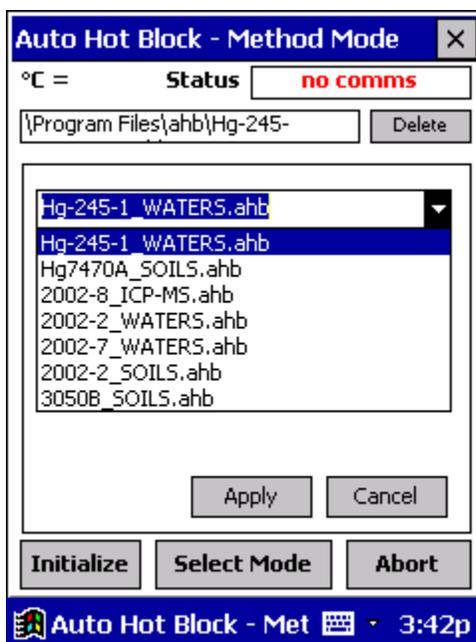
Do not reuse any cups that received reagent(s) during a previous digestion procedure, even if those cups did not contain a sample. This can result in cup failure, damage to the AutoBlock and sample loss. Reuse of cups that did not receive any reagent and remained dry throughout the procedure is acceptable.

7.1.1 Close the acrylic door

7.2 Selecting a Digestion Method

To select a method, switch to the method mode and press **Load**. Press the down arrow button on the right hand side of the box that appears. A drop-down menu displays all available methods. Select the appropriate method with the stylus, then press **Apply**. The name of the selected method will appear in the box at the top, and software text will be displayed in the large middle box.

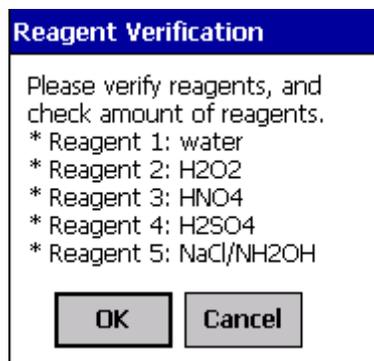
For proper digestion, it is important to follow ALL of these steps! Failure to follow these steps in their entirety may void the Warranty, and/or result in acid spills, AutoBlock failure and/or sample loss.



Select a Method

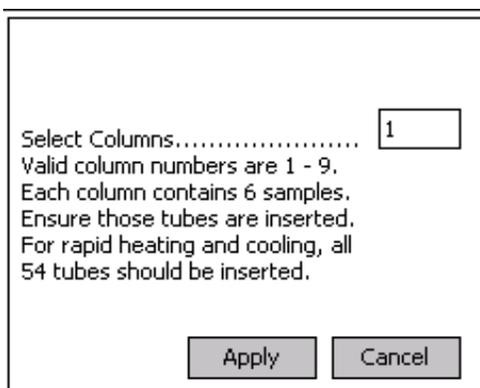
7.2.1 Press Start

The Reagent Verification screen will appear. See below. Check all reagent uptake lines closely to ensure that all are in the appropriate bottles and have sufficient volume to perform the digestion about to take place. Also check the drain line to insure that it is not fouled or crimped, and that it flows continually downwards to the waste collection container.



Reagent Verification

7.2.2 Enter the number of *Columns* to be digested



Enter # of Columns to be Digested

If you are completing these steps, the NEXT CLICK WILL BEGIN A REAL DIGESTION.

Be Sure that:

- 1- **ALL THREE RACKS ARE COMPLETELY FILLED WITH CUPS**
- 2- **ELEVATORS AND RACKS ARE IN THE *DOWN* POSITION**
- 3- **THE DOOR IS CLOSED**

7.2.3 Press *Apply*.

Sample digestion has begun.

7.2.4 During the Digestion

The PDA screen will gray-out. The only functional button becomes the ***ABORT*** button. If for some unexpected reason the digestion procedure must be paused, press *abort*. Verify this command by pressing *yes* in the box *Abort Method in Progress*. The AutoBlock will not stop its current function until the *Abort* command is confirmed.

In the event the abort button was pressed accidentally, press *No* in the acknowledgement box. Your digestion procedure will continue uninterrupted.

7.3 Repeating the same digestion method

If the next batch of samples are to undergo the same method as the preceding batch:

- (A) check your reagent levels
- (B) load racks with samples and cups as required
- (C) close the acrylic door
- (D) press *Reset*
- (E) Continue with steps beginning at 7.1.3

7.4 Running a New Method

If a new method is to be employed, press *Load* and select the required method. See section 7.1.

7.5 Features that Automatically Apply to all methods

The following features automatically apply to all methods including modified methods and custom methods. These features do not have to be programmed into the method development process.

1- Exhaust Fan

Automatically turns *On* when the digestion method is started, and continually runs throughout the method . Upon completion of the digestion method, the fan remains *On* until the graphite temp cools below 40°C. Below 40°C the fan cycles *On* every 30 minutes for 5 minutes to remove residual chemical vapors. This cycle continues until *Reset* is pressed in the method mode.

Note: For the best temperature uniformity results the fan speed is decreased when samples are heated. If condensation build-up occurs during the digestion see the Service Mode, Options section to increase fan speed.

2- Reagent Prep

Prior to injection of a reagent, all lines are filled with the new reagent.

3- Reagent Purge

After injection, all lines are purged of the reagent with DI Water.

4- Safety Features

Alarms signal an immediate need for attention. Alarms can be both visual and audible.

5- Elevators

Automatically raise samples for injection of reagents and sample cooling. For heating the samples the elevators automatically lower.

6- Safety

All standard safety features apply. See section 9 for details.

7- Progress indicators

Minutes-elapsed and minutes-remaining are displayed and updated throughout the procedure. In addition, the exact step the AutoBlock is performing is highlighted in blue in the *Method Procedure* box.

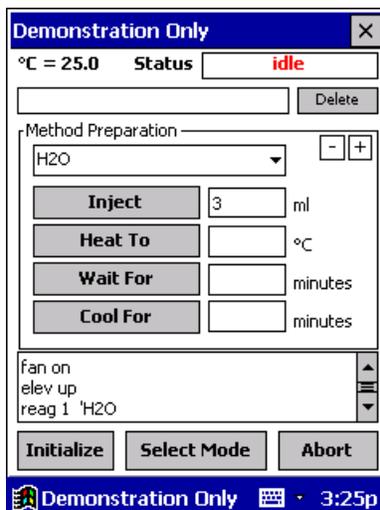
Once the digestion method is completed, the *Status* box will display *Method Done*.

8- Temperature

Graphite temperature is continually displayed in the upper left-hand corner of the screen. See section 5.3 for additional information

7.6 Creating a Custom Method

In the Method mode, press *new* in the method mode. Press the “+” (plus) button on the middle right hand side. This will bring you to the *automated method preparation* screen



Custom Method Development

Pressing the arrow in the *reagent box* will drop down a list of reagents that have been programmed to run on this unit. See section 6 for adding reagents.

7.7 Commands

A custom method is built one step at a time by entering *commands*. Commands include the following:

A) Inject

This command adds reagents. The *inject* range is 0.1-15mls in 0.1ml increments.

To inject a reagent:

- (1) Choose the appropriate reagent in the reagent drop down box.
- (2) Enter the volume required via the keypad.
- (3) Press *Inject*.
- (4) To inject secondary reagents, repeat this process *at the proper time* in the custom method.

Note: Purging the last reagent and prepping for the new reagent are *automatically* taken into account by the ahb. program, and need not be addressed in custom method development.

B) Heat To

This command determines the Set Point temperature, not sample temperature. Range is 10°-125° C increments of 0.1°. For establishing accurate sample temp, see section 5.3. Variable A or Variable B can be used in this field as well. See section 5.2 for additional details. “A” is 95.0 sample temperature without a reflux cap and “B” is 95.0 with a reflux cap. These are defaults. Insure that they have not been modified in the maintenance mode.

C) Wait For

This command determines the amount of time the samples will be heated during a step. Range is 1-999 minutes. The *Wait For* time does not start until the *Graphite temp* reaches within 5 degrees of the *Set Point temp*. An automatic command is sent for the elevator to lower the samples down into the block, prior to the countdown.

D) Cool For

This command sets the amount of time the samples will be cooled. Range is 0.1-999 minutes. The speed of the fan automatically increases to it's maximum for efficient sample cooling.

Technical Note

When creating a custom method, samples must be cooled for a *minimum* of 20 minutes between heating and adding a reagent. Based on our tests, we recommend you add 1-2 ml of DI Water prior to reagent additions. This helps cool samples even further. HYDROGEN PEROXIDE can cause violent reactions with some samples. A *minimum* of 35 minutes must be entered as a cooling time, and you *must add* 2ml DI Water prior to the injection of H2O2.

7.7.1 Example of Custom Method Development

1. The Method Mode press “New”
2. Press Down Arrow button in the reagent box. A drop-down list of reagents appears.
3. Choose “HCL”.
4. Enter “5” in the ml box next to “Inject”.
5. Press “Inject”.
6. Enter 106 into °C box next to “Heat to”.
7. Press “heat to”.
8. Enter “120” in the minutes box next to “Wait for”.
9. Press “Wait for”.
10. Enter “30” in the minutes box next to “Cool for”.
11. Press “Cool for”.
12. Press minus (-) button on the right of the screen.
13. Press “Save”.
14. Name your method with the keypad. *
15. Press “Apply”.

Following these steps creates a custom method that:

- (1) adds 5mls of HCL to the samples,
- (2) heats samples at a *Set Point temperature* 106° for 2 hours, then
- (3) cools for 30 minutes, and stops.

* Do not name methods using periods (.) or spaces. Using these will not save the method into the proper directory. Alternatively use dashes or underscores.

7.8 **Modifying Existing Methods**

If *simple* changes to temperature, heating times and/or reagent injection volumes are necessary, modification of an existing method is recommended.

However, if the changes are *significantly different* than any existing method, it is easier to follow the procedures in section 7.3, *Creating a Custom Method*.

7.8.1 **Steps for Method Modification**

(A) In the Method Mode, press *Load*.

(B) Choose a method from the drop-down box, and press *apply*.

(C) Press *edit*, and pull up the keypad.

(D) Using the scripts listed below, type in the desired additions.

Note: Automated functions (pressing the + button) are not valid entries. You must manually enter script to modify an existing method.

Command	Operand	Units (do not add to PDA)
Heat	10-130	° C
Inject	0-15	ml
Wait	0-1092	minutes

Wait is used for the amount of time to heat or cool the samples. See help menu in the PDA for additional commands although listed above are the simple commands that should be used.

7.8.2 Saving and Naming the new method

Press *save* to save the method. If you want to keep the method the same name click on that method and press *apply*. If you want to rename the method, pull up the keypad and type in the new name. All custom method names must end in *ahb*. *It is not necessary to type in ahb as the PDA will do that automatically. It is important not to add any spaces or periods (.) into the name of the method as it will not be saved in the correct directory and will not be available to run.*

Methods pre-installed from Environmental Express can not be renamed. Pre-installed method names end in *ROM*. *All custom methods should end in ahb.*

7.9 Logging Sequence

The AutoBlock software logs actions taken during each digestion procedure. After each method is run a log file is automatically created and stored in the AutoBlock file. To view or save the information, drag the file (located in the AutoBlock folder) to the PC using Microsoft Active Sync. The PDA will retain the logs for five digestion procedures before overwriting the oldest one, so you will need to download the method logs to a PC in order to preserve more than five histories. Each file name is in the format logXXXXXX.XXX, where X represents a digit (e.g. log39999.999). The lowest number is the oldest file.

Example:

```
Method \Program Files\AutoBlock Demo\TEST LES.ahb Started @
1/30/00 4:13:50 PM
Columns to Inject: 4
@1/30/00 4:13:51 PM: FAN ON
@1/30/00 4:13:52 PM: ELEV UP
@1/30/00 4:13:53 PM: REAG 2
@1/30/00 4:13:54 PM: INJECT 2.0
@1/30/00 4:14:11 PM: HEAT 95.0
@1/30/00 4:25:06 PM: ELEV DOWN
@1/30/00 4:25:07 PM: WAIT 10.0
@1/30/00 4:35:09 PM: ELEV UP
@1/30/00 4:35:10 PM: HEAT 20.0
@1/30/00 4:35:11 PM: WAIT 5.0
@1/30/00 4:40:13 PM: REAG 3
@1/30/00 4:40:14 PM: INJECT 3.0
@1/30/00 4:40:28 PM: HEAT 95.0
@1/30/00 4:44:45 PM: ELEV DOWN
@1/30/00 4:44:46 PM: WAIT 5.0
Method Ended Normally @ 1/30/00 4:49:48 PM
```

Section 8: AutoBlock Safety Features

Your AutoBlock is designed with numerous safety features. Although these safety features are well designed, there can be situations not addressed by safety features and/or AutoBlock safety features may fail. Therefore always use caution when operating the AutoBlock, and never operate the AutoBlock without properly trained personnel nearby.

Following is a partial list of AutoBlock safety features. Many of these features are discussed in greater detail in other sections of the manual. If an alarm activates and you have concerns, contact technical support at Environmental Express.

(1) Pressure Sensor

A pressure sensor is located in the digestion chamber. During digestions this sensor continually monitors air pressure inside the chamber. If the acrylic door is opened or if the exhaust fan quits functioning properly, the pressure sensor will cause an alarm to sound.

(2) Leak detector

A leak detector is located near the pump and splitter in the rear of the AutoBlock. Should a leak occur in this compartment, an alarm will sound, and the digestion method will be aborted. To reset the leak detector, it must be free of liquids. Dry the metal screen with a hair drier. It may be necessary to disassembly the screens and dry them if acid or other higher temperature liquids have entered the area. Add 20 ml of DI in the manual mode (to the drain) while inspecting the detector area for any leaking liquids. If the alarm sounds again inspect carefully. A fine mist will cause the alarm to go off. It may not be a drip or spray. Fix any leaking parts. See figure 1 and figure 2 at the end of the manual for re-assembly of the leak detector (page 44-45).

(3) Overheat Shutoff

Should the AutoBlock overheat, it will automatically shut off.

(4) PDA disconnect alarm

If the PDA is removed from the PDA cradle while ON, it will sound an alarm.

(5) Abort button

The Abort button can be used anytime during a method to stop the AutoBlock.

(6) Electronics Cooling/Purge Fan

The electronics purge fan on the rear panel reduces the possibility of acid vapors damaging electronic components and reduces the possibility of those same components from overheating.

(7) Safety Coating on graphite block

The graphite heating block is Teflon coated to protect it from acid spills.

(8) Fire resistant & chemical resistant construction

The AutoBlock is constructed of Kydex, a plastic resistant to both fire and chemicals normally associated with metals digestions.

Section 10: Contact info

Feel free to contact us as the need arises. We realize the importance of technical support, and are willing to deliver the service you need to make your Environmental Express® AutoBlock™ operate as efficiently as possible.

Phone 800-343-5319 0830 – 1730 hours EST (8:30 AM – 5:30 PM)

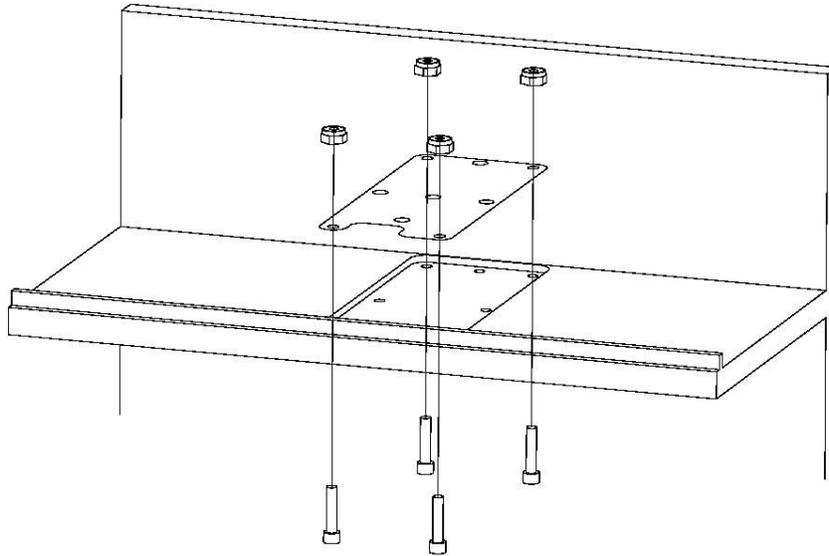
843-881-6560

Fax 843-881-3964

Email Info@envexp.com

Figure 1

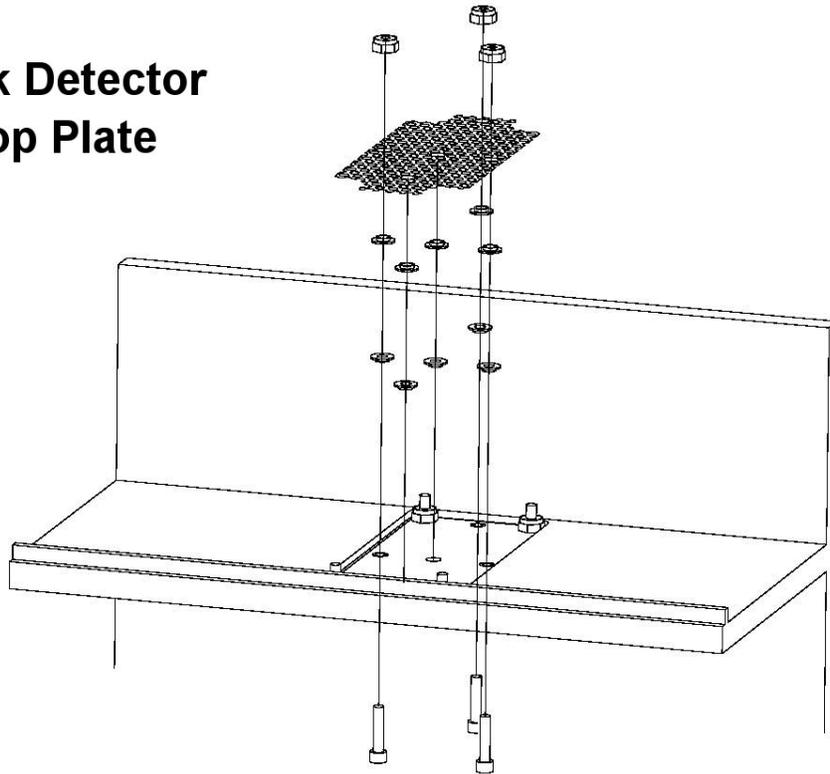
Leak Detector



- HOLDING THE BOTTOM PLATE DOWN:**
- 1. THE FOUR CORNER SCREWS ARE SCREWED INTO THE PUMP PLATE**
 - 2. THE BOTTOM PLATE IS SLID OVER THE FOUR SCREWS**
 - 3. THE LOCKNUTS ARE TIGHTENED OVER THE FOUR SCREWS**

Figure 2

**Leak Detector
Top Plate**



- HOLDING THE TOP PLATE DOWN:**
1. THE THREE REMAINING SCREWS ARE SCREWED INTO THE PUMP PLATE
 2. THREE TEFLON SHOULDER WASHERS ARE SLID SHOULDERS DOWN OVER THE THREE SCREWS
 3. THREE TEFLON SHOULDER WASHERS ARE SLID SHOULDERS UP OVER THE THREE SCREWS
 4. TWO TEFLON SHOULDER WASHERS ARE PLACED SHOULDERS DOWN IN THE TWO REMAINING HOLES
 5. TWO TEFLON SHOULDER WASHERS ARE PLACED SHOULDERS UP OVER THE TWO OTHER WASHERS
 6. THE TOP PLATE IS SLID OVER THE THREE SCREWS AND 10 WASHERS
 7. THE LOCKNUTS ARE TIGHTENED OVER THE THREE SCREWS