

AutoBlock

Operation Manual



AutoBlock Serial Number: _____

Electrical Box Serial Number: _____

ENVIRONMENTAL EXPRESS

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AutoBlock

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.

What's included

SINGLE UNIT

1	AutoBlock Manual
1	AutoBlock Unit
1	AutoBlock Electrical Unit
1	Power Cord
3	Racks
6'	½"ID Drain Tube
1	10L Carboy
1	½" Barb Fitting
5	Flangeless Nut
5+2 extra	Flangeless Ferrules
25'	1/16"ID Reagent Tubing

DUAL UNIT

1	AutoBlock Manual
1	AutoBlock Unit
1	AutoBlock Electrical Unit
1	Power Cord
3	Racks
6'	½"ID Drain Tube
1	10L Carboy
1	½" Barb Fitting
10	Flangeless Nut
10+2 extra	Flangeless Ferrules
50'	1/16"ID Reagent Tubing

Unpacking

Retain all packaging material 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 has been included. Use this list to inventory components, as they are unpacked.

Note:

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

Uncrating Instructions

- Cut banding from crate, use standard safety precautions.
- Lift the entire cover from the crate.
- Carefully remove
Foam Filler
Inner Box from the side. This box contains the electrical box, power cord & manual
Front Door that is secured to the back of the cabinet
- Remove the 10L carboy, 3-racks, reagent tubing & start up kit. There are several pieces of packaging material in place for protection. All material must be removed.
- Remove the protective tape from the sample probe cap, reagent entry plate, JC connectors, pump compartment door & touch screen.
- The unit will need to be cleaned from residue during shipment. Using compressed air, clean the inside of the AutoBlock.

The AutoBlock unit is now ready to be installed. Please read installation instructions.

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AutoBlock

INSTALLATION

■ Preparing the AutoBlock

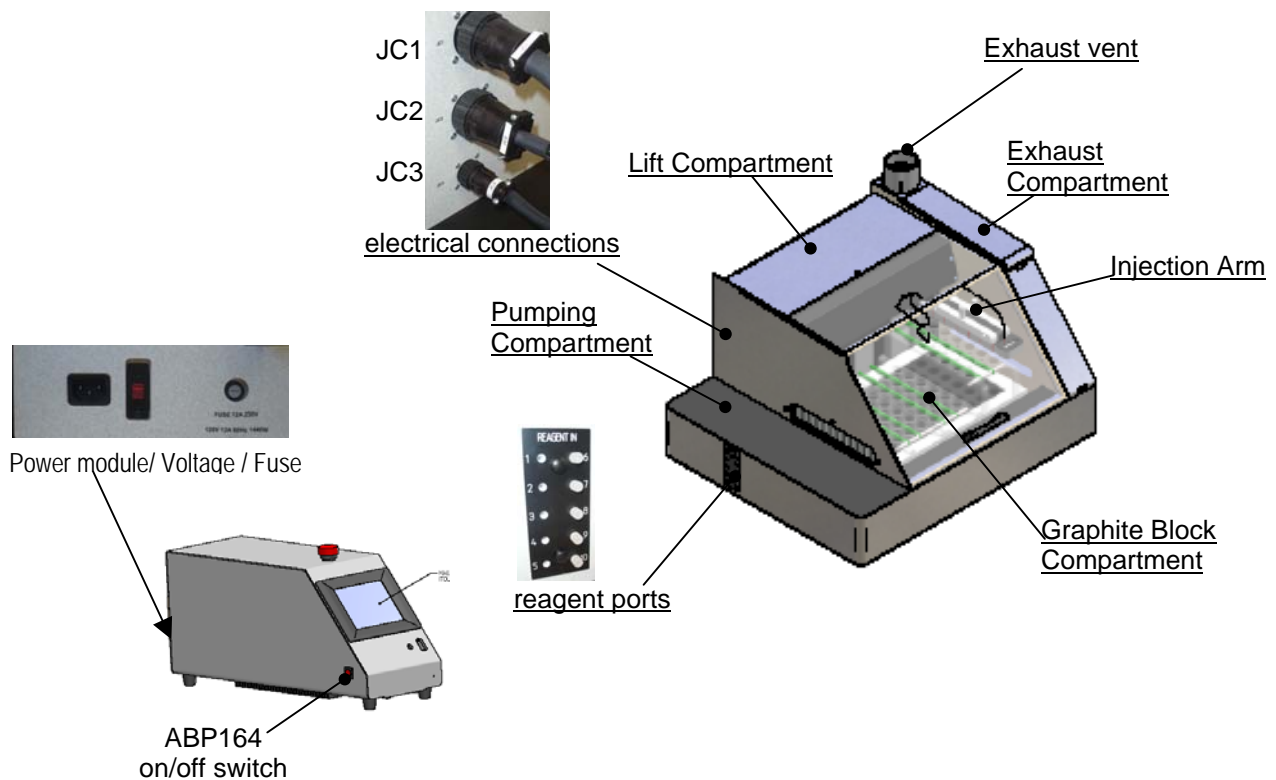
Follow the instructions for uncrating from the quality control sheet supplied with the unit or introduction section of this manual. Follow the installation procedure step by step to insure proper function of the unit.

Note: 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 check during quality control inspection.

■ Space & Weight Requirements

Lift the AutoBlock from the bottom only. The unit weights approximately 200-lbs. carefully place the unit on a sturdy counter with the following minimum requirements:

- Counter must be able to support a minimum 300-lb load.
- Space requirements: 38"W x 32"L x 26"H these are the minimum requirements. Additional space will be needed for reagents & a carboy placed under the unit.



■ Ventilation

The AutoBlock exhaust is located on the top right portion of the unit. Install a 4" diameter acid-resistant duct and clamp to the exhaust outlet. Vent using state & federal guidelines. When connecting ductwork, verify zero to negative pressure to prevent backflow. The length of the duct should not exceed 25'. Vent the duct to the outside of the laboratory building or plumb into the existing ductwork.

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INSTALLATION

■ Front Door Installation

Unpack the front door assembly using caution not to scratch the acrylic. Both hinge pins have been inserted into the door assembly as shown.



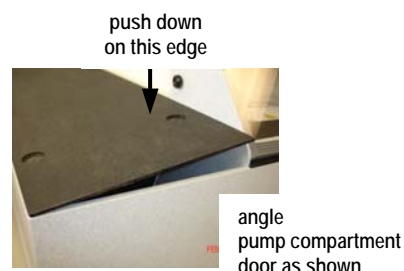
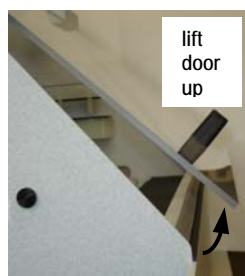
Remove the hinge pin from the left side using a hex wrench.

Place door in cabinet opening, sliding the right side hinge pin into the cabinet location.

Align the left side hinge pin location & screw in the second hinge pin. Hand tighten the hinge pin.



Lift the door & close it. It will be a snug fit. Lift the door up & slide back. After the installation of the front door, Environmental Express does not warranty breakage due to operator handling.



■ Closing the **Pump Compartment Door**

Insert edge first along the outside of the cabinet. Tilt the other edge at 10° angle along the filter side of the cabinet. Push down to close.

■ Install Reagent Line

The following steps will connect 2.5 liter or standard 38mm top, reagent bottles to AutoBlock. These are standard 2.5L acid bottles. For the DI water ports, 1 & 6, use a clean acid bottle filled with H_2O .

Uptake Reagent Components

Components are supplied in a start up kit

SINGLE UNIT

5 Flangeless Nuts
5 + 2 extra Flangeless Ferrules
25' Reagent Lines 1/16"ID

DUAL UNIT

10 Flangeless Nuts
10 + 2 extra Flangeless Ferrules
50' Reagent Lines 1/16"ID

Vented Reagent Caps (optional)

Reagent Bottom of the Bottle Filter (optional)

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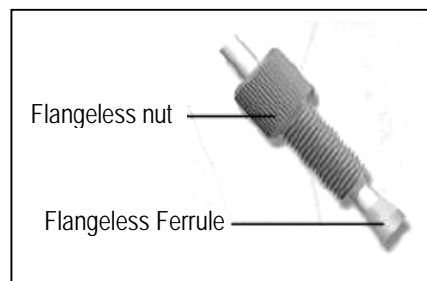
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AutoBlock

INSTALLATION

■ Reagent Line Assembly

1. Cut appropriate lengths of 1/16"ID Teflon tubing, not to exceed 5' lengths. The ends need to be a square-cut face.
2. Slide the flangeless nut over the tubing, with the nut threads facing the tubing end.
3. Slide the flangeless ferrule over the tubing, with the tapered portion of the ferrule facing towards the nut. The large diameter of the ferrule should be pushed to the end of the tubing.
4. AutoBlock reagent ports are located on the left side of AutoBlock labeled #'s 1-10.
5. Insert the tubing with the flangeless ferrule into the receiving port until it bottoms. While holding the tubing, tighten the Flangeless nut finger tight. The tubing should not be able to move in the port.



reference diagram for placement

Repeat for all ports available.

■ Placement of Reagent Rack

Position the six-bottle reagent rack (optional) on the left side of AutoBlock. For dual systems, there may be two six-bottle reagent racks (optional).

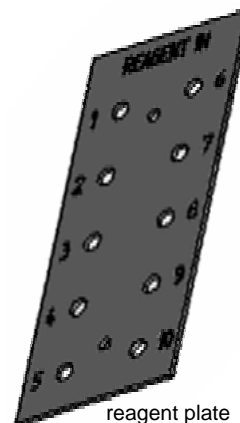
■ AutoBlock Reagent Port

AutoBlock reagent ports are located on the left side of AutoBlock, labeled #'s 1-10. The reagents have been set up in the following manner:

Single System		Dual System**	
*Port #1	H2O(1)	*Port #6	H2O(6)
Port #2	HNO3(2)	Port #7	KMnO4(7)
Port #3	HCL(3)	Port #8	PERSULF(8)
Port #4	H2O2(4)	Port #9	NH2OH(9)
Port #5	H2SO4(5)	Port #10	H2O(10)

*Ports #1 & #6 must remain H₂O

**In a single system ports #6-10 have been plugged.



reagent plate

If these reagents do not suit your application, you may change them. Changing the reagents and ports numbers are addressed in the SERVICE TAB – SETUP REAGENT section.

Vented Reagent Caps and Bottom of the Bottle Filter (optional)

Loosen the nut on the top of a vented reagent cap. Insert one end of reagent tubing through the nut until it reaches the bottom of the 2.5L bottle. Hand tighten the nut.

A bottom of the bottle filter may be used to filter the reagent. Attach this to the end of the tubing before inserting it into the 2.5L bottle.

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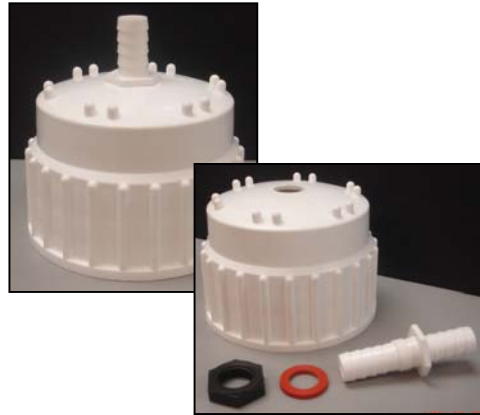
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INSTALLATION

■ Install Drain Line & Carboy

- Remove the ½" barb fitting from the bag of parts supplied
- Remove the nut from the fitting
- Remove the cap from the carboy
- Place the fitting into the cap. The threaded portion of the fitting needs to be on the inside of the cap.
- Place the washer & then nut onto the fitting & tighten.
- Place the cap back onto the carboy.



carboy cap & bulkhead fitting

- The drain line is located on the right side towards the back of the unit. Place the supplied ½" tubing onto the barb fitting and the other end to the carboy. Insure the tubing goes in a DOWNWARD direction the entire length.

The system is designed for downward gravity flow throughout the entire length to the carboy. Place the carboy under the AutoBlock.

■ Electrical Box Installation

- Position the on/off switch to the **off** position.
- A 10' power cord has been supplied.

Power requirements are standard 115VAC 12A US and Canada
Power requirements are standard 220VAC 6A International



on/off switch

Plug the power cord into the power module located in the back of the electrical box and into a standard AC outlet

- Place the electronic box on the platform of the AutoBlock, left hand side of the unit. The mounting feet will rest in the recessed holes.
- Connect the three cables from the electrical box to the AutoBlock system on the left side. JC1, JC2 and JC3 have been marked on the cable connector & on the AutoBlock.

Congratulations

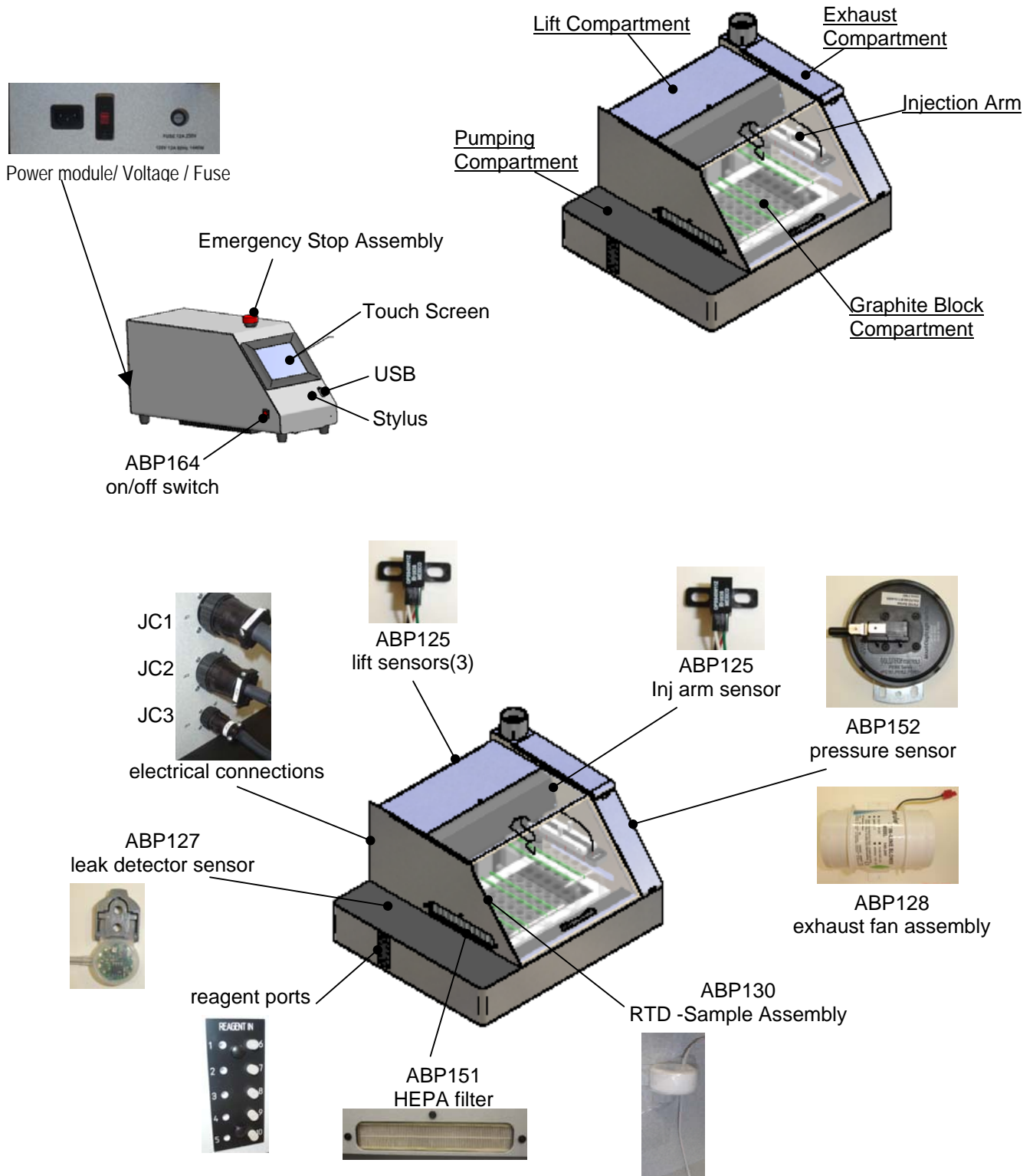
You have finished physically setting up the AutoBlock and are ready to move onto a systems check and calibration. A systems check and calibration set up must be done before any methods run.

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AutoBlock

System Overview Component Layout

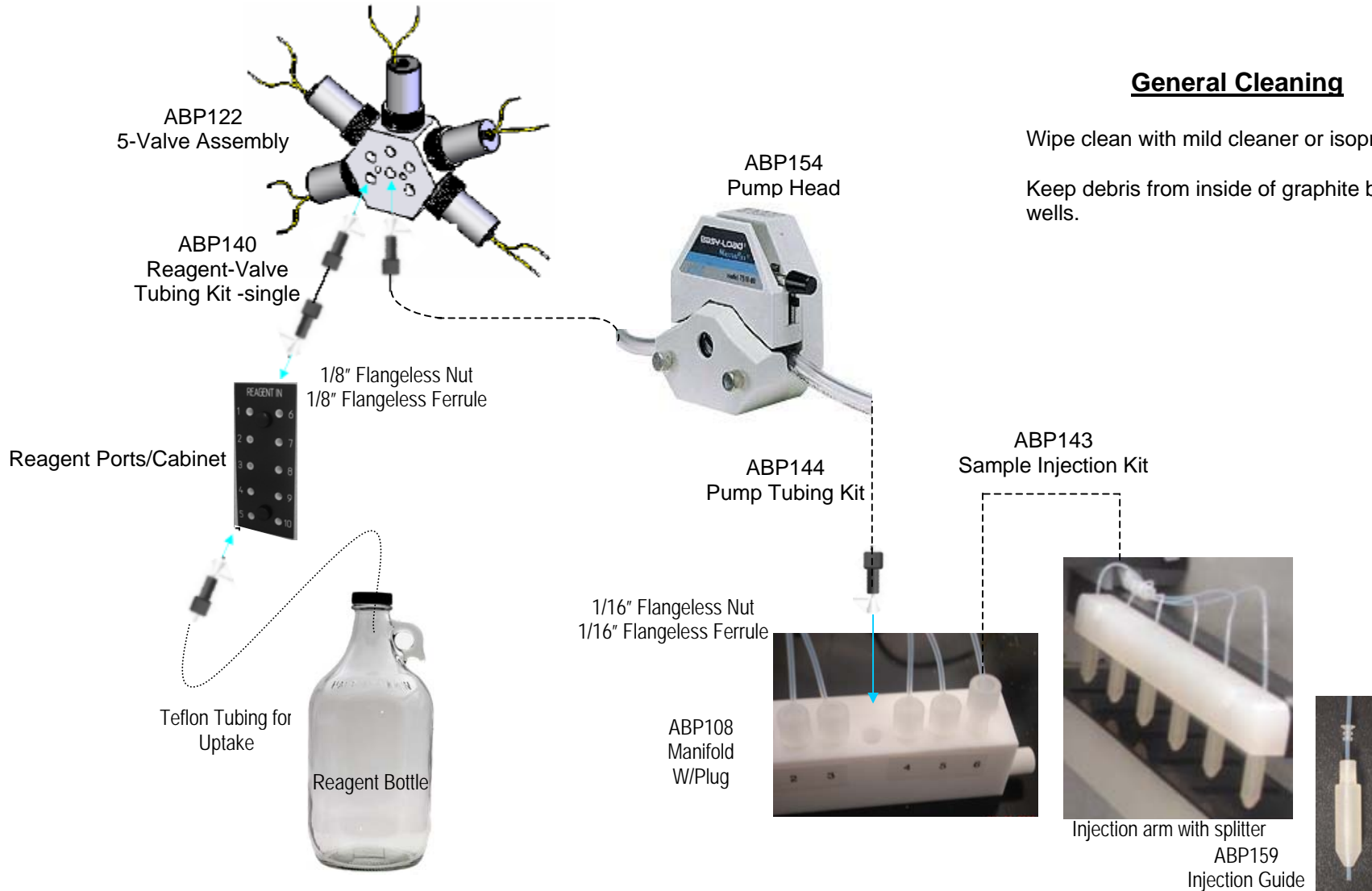


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System Overview Reagent Flow Path



General Cleaning

Wipe clean with mild cleaner or isopropyl.
Keep debris from inside of graphite block wells.

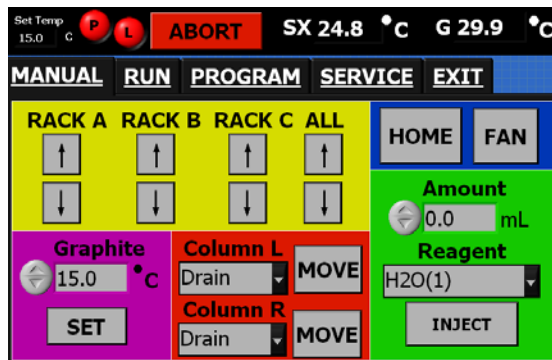
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TOUCH SCREEN CONTROLLER

The touch screen controller is specifically designed for use with the AutoBlock. Once the system is turned on, the AutoBlock software will automatically load. Pressing the screen tabs or input boxes with the attached stylus activates the touch screen. It is not necessary to push very hard, this may damage the screen.



Manual Tab

Main Screen Functions

There are several operations that appear permanently on the touch screen. There are FIVE tabs of operation located at the top of the touch screen:

MANUAL RUN PROGRAM SERVICE EXIT

The MANUAL screen will appear at start up.

- A pop up message will appear: "READY TO HOME MOTORS?" Press the **Continue** button.
- Motors will activate to initialize in their home positioning.
- A pop up message will appear: "MOTORS ARE HOMED" Press the **Continue** button.

To switch between tabs, press the appropriate tab with the stylus. Each tab will be described in this manual to allow the analysts to fully operate the AutoBlock.

The main screen will go into sleep mode when left unattended. Touch the top of the screen with the stylus to awaken.

Sensor Indicators

Alarm sensors are located in the upper left portion of the screen and when triggered change color. These sensors may take a few moments to change its status, it is not instantaneous.



Pressure Sensor

Located in the *Exhaust Compartment*. Detection if a pressure drop has occurred.
Green light will indicate a positive operating state
Red light will indicate the sensor has been activated & needs attention.



Leak Detector Sensor

Located in the *Pumping Compartment*. It will detect if there is a leak present.
Green light will indicate a positive operating state
Red light will indicate the sensor has been activated, immediate attention should be given to this situation. The AutoBlock will not operate until the leak has been resolved. Reference Start Up Instructions–Sensor Validation section of this manual for addition information.

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AutoBlock

TOUCH SCREEN CONTROLLER



Emergency Stop

ABORT Abort Button

If you need an emergency stop depress the **E-STOP** immediately.

Activate the ABORT

By selecting the abort button, the abort operation will seize all communications to the control board. The temperature will not read correctly and will not heat. All motion is stopped. The ABORT button will turn green.

-A pop up message will appear: *"DO YOU WANT TO ABORT"*

Pressing the **Cancel** button will bring you back to the main screen and the abort command will not be activate.

Press the **Abort** button to activate the abort command, a pop up message will appear

"CONTINUE TO TURN ON FAN"

"CANCEL TO TURN OFF FAN"

Press the **Continue** button to turn the fan on.

If fumes are present or the block is greater than 40°C, it is recommended to keep the fan on

Pressing the **Cancel** button to leave fan off.

Deactivate the ABORT

After selecting to turn on the fan or leave off

-A pop up message will appear: *"READY TO HOME MOTORS?"*, Press the **Continue** button.

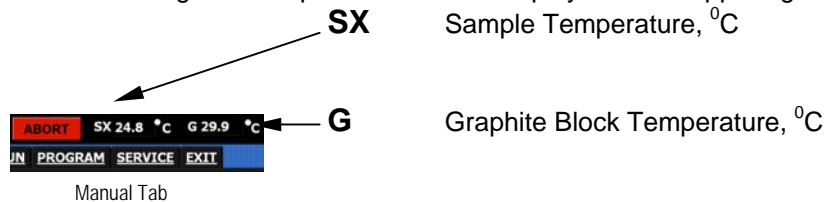
-Motors will activate to initialize in their home positioning.

-A pop up message will appear: *"MOTORS ARE HOMED"*. Press the **Continue** button.

The ABORT command will then be deactivated and the ABORT button will turn red.

Temperature Readouts

Actual temperature readings for samples & block are displayed in the upper right portion of the screen.



Sample Temperature

Place the external thermocouple, located inside the front compartment, into a sample for accurate reading.

Temperature that has been set to the graphite block , °C

Displayed in the upper left portion of the screen.

Reference the Manual Tab for setting the block temperature.



Manual Tab

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■ On Board Keyboard

To activate this feature, select the icon on the task bar with the stylus.

Typing

- keyboard acts as any standard keyboard
- press the *SHIFT* button to change the top row symbols/numbers
- press the *CAPS* button to change from low/capital letters

Move keyboard

- Touch the keyboard and drag across the screen to new location.



To deactivate the keyboards,

- select the icon on the task bar
- or the icon on the keyboard located on the bottom row next to the control button
- or the X in the upper right-hand corner

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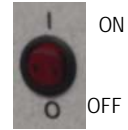
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AutoBlock

START UP INSTRUCTIONS

These start up instructions are to aid in optimizing the performance of AutoBlock. Your system has gone through a quality control check during manufacturing. These parameters need to be checked at setup to ensure the system is in operable condition and the parameters meet your laboratory specifications. All parameters can be changed to meet your laboratory specifications.

If you need assistance during this set up instructions, please feel free to call Environmental Express during normal business hours. Contact information is listed at the bottom of each page.



on/off switch

Power switch & load software

The touch screen controller is specifically designed for use with the AutoBlock. Once the system is turned on, WindowsXP will start up and the AutoBlock software will start to load. This will take about 30-seconds

It is not necessary to push very hard, this may damage the screen. Pressing the screen tabs or input boxes with the attached stylus activates the touch screen.

Once the screen has initialized the onboard keyboard will pop up. Disable the keyboard by depressing the *DISABLE* button located next to the control button

There are several options to start the AutoBlock software:

- Double Click the *ABIII icon* on the main Desktop
- Select the *START* button on the task bar and select the *ABIII icon*
- Select the *START* button on the task bar and select *All Programs* and then select the *ABIII icon*

The *MANUAL* screen will appear at start up.

- A pop up message will appear: "*READY TO HOME MOTORS?*" Press the **Continue** button.
- Motors will activate to initialize in their home positioning.
- A pop up message will appear: "*MOTORS ARE HOMED.*" Press the **Continue** button.

There are FIVE tabs of operation located at the top of the touch screen:

MANUAL RUN PROGRAM SERVICE EXIT

Testing Injection System

In Manual tab, prime the line with H₂O as follows. For initial injection test, H₂O should be used on all ports.



Manual Tab

1. Remove the pumping compartment cover, placing the electrical box off to the side of the AutoBlock unit.
2. Place 3-racks with vessels onto the lift arm.
The racks should be in the up position. Press the ↑ in the *ALL* button in the yellow section of the screen.
3. Inject each reagent line with 10ml of H₂O. Inspect tubing for any air bubbles.
Refer to *MANUAL TAB* on instructions for injection
If air bubbles are present, inspect all connections & repeat by injecting 10ml of reagent for re-inspection.
Air bubbles may be caused from improper face-to-face connections.
4. Repeat for each port #1-5 (single unit) and #1-10 (dual unit)

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AutoBlock

START UP INSTRUCTIONS

■ Sample Injection Tubing / Pump Calibration

Follow the steps to Calibrate Sample Injection Tubing and Calibrate Pump under the Service Tab in this manual.

The Sample Injection Tubing and Pump(s) has been tested and calibrated during manufacturing. It is best to calibrate the system again to ensure accuracy.

■ Maintenance

Review and set up the Maintenance portion under the Service Tab in this manual. The maintenance schedule has been set during manufacturing. There will be popup alerts on the touch screen to remind the operator to inspect & maintain the AutoBlock.

■ Sensor Validation

Change of status may take a few moments. It is not an instant response. If these sensors indicators do not change status please review the System Overview section of this manual for setting them to a positive operating condition.

1. From the Manual Mode, turn the fan on by pressing the *FAN* button. The Pressure Sensor indicator **P** on the touch screen, will turn green when operating correctly. The front door must be closed.
2. Close the front door and the pressure sensor indicator **P** will turn red
3. Press the *FAN* button to turn the fan off. The pressure sensor indicator **P** will turn red.

The Leak Detector Sensor indicator **L** on the touch screen will be green when no leak is detected.



Manual Tab

You are now ready to successfully run digestion methods in your new AutoBlock.

Reference Program Tab for creating and editing methods.

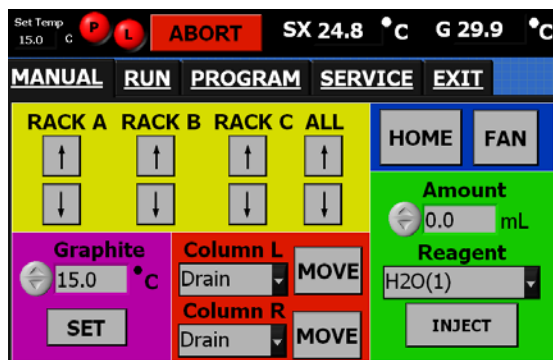
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MANUAL TAB

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



Manual tab screen with dual system

Rack Movement (yellow section)

The (3) 18-position rack have been designed to hold 50ml vessels for a 54-well block.

Each rack can be moved up or down individual from one another. By pressing the ↑ will raise the rack ↓ will lower the rack

Rack A located on the left, columns 1-2-3

Rack B center location, columns 4-5-6

Rack C located on the right, columns 7-8-9

All will raise or lower all three racks one at a time



COLUMN & RACK DESIGNATION

After selecting ↑ or ↓

-A pop up message will appear: "RACK UP?", Press **Continue** or **Cancel** button.

Cancel

A pop up message will appear: "CANCELLED?", Press **Continue** button
You have canceled the command & return to the manual tab

Continue

The selected rack will move in the selected direction

A pop up message will appear: "RACK IS UP.", Press **Continue** button

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MANUAL TAB

■ **HOME** (blue section)

This operation will home the three lift motors and the injection arm motor.
The three lift motors will go to the down position and the injection arm will position itself over the drain.

Press the *Home* button

-A pop up message will appear: "*HOME MOTOR?*" Press **Continue** or **Cancel** button.

Cancel

You have canceled the command & return to the manual tab

Continue

The lift & injection arm motors will activate

A pop up message will appear: "*RACKS ARE DOWN AND ARM IS LOCATED OVER THE DRAIN.*", Press **Continue** button

■ **FAN** (blue section)

By pressing this button the fan will turn on or off.

A confirmation message *fan is on/off*. Press the **OK** button.

The fan will automatically turn on when the block is over 40°C, and cannot be turned off below 40°C

■ **Graphite** (pink section) **Range: 15°C-150°C**

Set the temperature to the graphite block with the ▼ or ▲ buttons, or by using the keyboard.

The temperature is set in °C, inc/dec by 0.1°C

After selecting a temperature press the **SET** button.

- A pop up message will appear: "*THE BLOCK TEMPERATURE HAS BE SET*" Press **Continue** button

The change will also reflect the readout on the upper right corner of the screen

NOTE:

The temperature of the graphite block will not be the temperature of the external thermocouple (sample probe).

Test the sample temperature to achieve proper graphite temperature.

Heat the graphite block to 115°C, the sample probe should read 95°C

The use of the reflux cap (SC506) will raise the sample temperature 10°C

AutoBlock

MANUALTAB

Arm (red section)

Select which column you would like a reagent injected to by the pull down menu

-Select DRAIN, 9,8,7,.....1

-Press the **MOVE** button

-A pop up message will appear: "MOVE INJECTION ARM?",

Press **Continue** or **Cancel** button.

Cancel

You have canceled the command & return to the manual tab

Continue

The injection arm will move to the selected column

A pop up message will appear: "INJECTION ARM MOVE COMPLETE."

Press **Continue** button



single unit system shown
dual unit has two splitters

NOTE: **Dual System**

There will be a left & a right splitter.

ARM (1-5) will inject thru the left splitter

ARM (6-10) will inject thru the right splitter

Inject (green section) **Range:** 0.1ml-50.0ml

Select which column to be injected thru the ARM-section and move injection arm before proceeding.

The Inject command does not automatically purge or prep. Bring the injection arm to the drain and inject 6ml H₂O(1) to purge and 6ml of reagent to prep.

Amount

Select the amount of reagent to be injected with the ▼ or ▲ buttons or by using the keyboard.

The volume is set in ml. inc/dec by 0.1ml

Reagent

Select the Reagent to be injected from the drop-down menu. Reagents have been pre-installed.

Reference the SERVICE TAB-REAGENT SETUP for port configuration and to make changes

EXAMPLE: H₂O(1) Reagent H₂O is connected to port (1) on the AutoBlock unit

-Select *REAGENT(PORT)*

After selecting a reagent press the **INJECT** button

-A pop up message will appear: "INJECT REAGENT?" Press **Continue** or **Cancel** button.

Cancel

You have canceled the command & return to the manual tab

Continue

The reagent will inject the specified amount

A pop up message will appear: "REAGENT INJECTED." Press **Continue** button

NOTE: **Dual System**

REAGENTS (1-5) will inject thru the left splitter

REAGENTS (6-10) will inject thru the right splitter

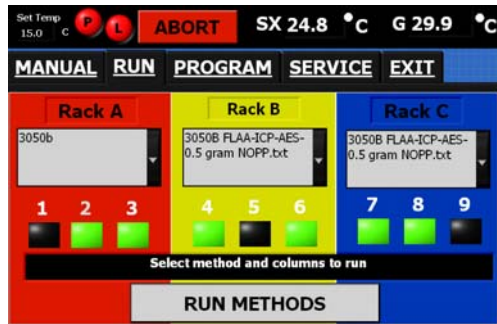
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AutoBlock

RUN TAB

The RUN TAB determines what methods will be selected and to what racks/columns they will be run.



Run Tab

Rack A / Rack B / Rack C

After determining which rack(s) are going to be used, select the method you want to run. Some methods have been pre-programmed. Reference Program tab in the manual for adding/editing methods
Load racks onto the lift arms in the down position

NOTE:

For proper airflow, all racks should be filled with empty cups. No need to run reagents in those columns. Each column must contain 6 cups. Polypropylene cups can only be used to 130°C

Selecting Methods

A default program will appear in all three racks. Select method to be used from the pull down menu. When selecting a method start with Rack A, then proceed to Rack B then Rack C.

Protocol for running different methods at the same time
The same temperature and the same reagents must be used for each method.
This will allow you to run 1, 2 or 3 different methods at once.

Activating Selecting Columns

If running all three racks, select column 9
If running racks A & B, select column 6
If running Rack A only, select column 3
-A pop up message will appear: "COLUMNS X-X ARE ACTIVE." Press **Continue** button.
the active column indicator will turn **green**

Deactivating Selecting Columns

Select the column to deactivate
The de-active column indicator will turn **black**

Run Methods

Press the **RUN METHODS** button to begin.
The AutoBlock software will check for syntax errors in methods before starting

-A pop up message will appear: "CONTINUE WITH METHOD?"; Press **Continue** or **Cancel** button.

Cancel

A pop up message will appear: "METHODS CANCELED?"; Press **Continue** button
You have canceled the command & return to the run tab

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AutoBlock

RUN TAB



Run Methods continued

Continue

The racks and the injection arm will home and the method will begin.

Under the rack/method/column section, the screen will show which current command is being executed in the method.

If syntax error occurs

The AutoBlock software will check for syntax errors in methods before starting

-A pop up message will appear: "SYNTAX ERROR XX –method command line appears"

-Look up syntax error in the PROGRAM TAB section of this manual.

-Press **Continue** button

-A pop up message will appear: "SYNTAX ERROR. METHOD CANNOT START. PLEASE FIX ERRORS."

- Press **Continue** button

-Return to the PROGRAM TAB to edit the method. Saving the edited method before running.

If incompatible methods occurs

The AutoBlock software will check for syntax errors in methods before starting

-A pop up message will appear: "HEAT TEMPERATURES MUST BE THE SAME FOR ALL THREE METHODS"

-Press **Continue** button

-A pop up message will appear: "SYNTAX ERROR. METHOD CANNOT START. PLEASE FIX ERRORS."

-Press **Continue** button

-Select compatible methods to run or run at different times

Pause Button

You may select this at any point. AutoBlock will finish the current step and then pause.

-A pop up message will appear: "METHODS WILL PAUSE AS SOON AS CURRENT COMMAND IS COMPLETE" Press **Continue** button.

Continue

A pop up message will appear: "METHODS PAUSED. TO RESUME METHODS CLICK CONTINUE ?", Press **Continue** button

The method will now resume from its last executed command.

Main Screen Abort Button

You may select this at any point. By selecting the abort button the abort operation will seize all communications to the control board. The temperature will not read correctly and will not heat. All motion is stopped. Reference TOUCH SCREEN CONTROLLER section of this manual

If you need an emergency stop depress the E-STOP.



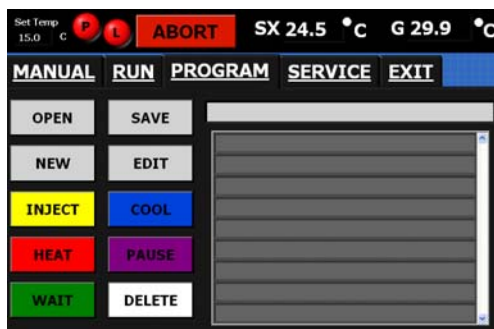
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AutoBlock

PROGRAM TAB

Methods are stored and can be edited. Custom methods can be programmed into the AutoBlock. Below depicts the Program Tab. Each command will be described in detail to ensure operator understanding.



Program Tab

program mode –heat screen




HEAT

Set the block temperature in °C. Range: 15⁰C to 150⁰C

This is not sample temperature.

Polypropylene cups can only be used to 130⁰C

Command Sequence:

1. Select HEAT command from the main menu
2. Select the block temperature by up or down buttons  or by keyboard. (°C)
3. Added User Notes. With the keyboard activated, press comment area with stylus and type
example note: *heat samples for 2 hours*

NOTE: Racks will not lower into graphite until within 5 degrees of set point.

INJECT

This command adds reagents. Range: 0.1 - 50 ml

The injection arm will move over the drain, raise the racks, prep the lines with 6ml of reagent, inject the specified amount of reagent into selected columns, move the injection arm to the drain & purge lines with 6ml of water. Racks are left in the up position.



program mode –inject screen

The lines will prep & purge unless specified by the **no prep** or **no purge** command. This can be done by using the ADD command.

If the reagent is not listed in the drop down menu, go to the SERVICE TAB –Setup Reagents, to add them in.

Command Sequence:

1. Select INJECT command from the main menu
2. Select the reagent from the drop down menu
3. Select amount to inject by arrow buttons or by keyboard (ml)
4. Added User Notes. With the keyboard activated, press comment area with stylus and type.

Proceed to the **continue** button

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AutoBlock

PROGRAM TAB

■ WAIT

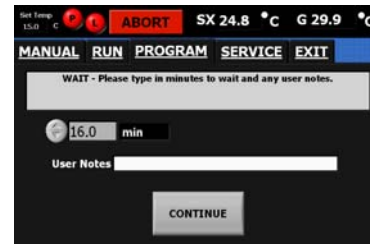
Sets the amount of time the samples will be heated during a step.
Range: 1-999 minutes.

The method will wait for the set graphite temperature to be reached, $\pm 5^{\circ}\text{C}$ degrees, rack are then lowered. The method will then wait for the specified number of minutes.

Command Sequence:

1. Select WAIT command from the main menu
2. Select the wait time by up or down buttons  or by keyboard. (minutes)
3. Added User Notes. With the keyboard activated, press comment area with stylus and type.

Proceed to the **continue** button




program mode –wait screen

■ COOL

Set the amount of time the samples will be cooled. Range: 1-999 minutes

The racks will be raised out of the graphite block and cool for the specified number of minutes. The fan will automatically increase to its maximum for efficient sample cooling.

Command Sequence:

1. Select COOL command from the main menu
2. Select range by up or down buttons  or by keyboard. (minutes)
3. Added User Notes. With the keyboard activated, press comment area with stylus and type.

Proceed to the **continue** button



program mode –cool screen

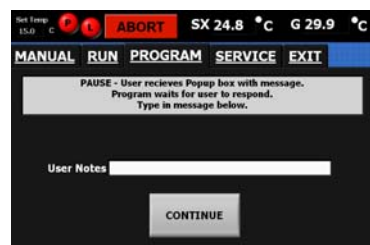
■ PAUSE

An operator will receive a pop up message. The method will not execute the next command until the analysts responds.

Command Sequence:

1. Select PAUSE command from the main menu
2. Add message with the keyboard activated, press comment area with stylus and type.
Example message: *Insure volume level is correct*

Proceed to the **continue** button



program mode –pause screen

■ DELETE

Directly deletes last command from the method screen.

Command Sequence:

1. Select PAUSE command from the main menu

Proceed to the **continue** button



program mode –sample program

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AutoBlock

PROGRAM TAB

EVERY METHOD

At the end of each method the following two commands need to be added

With the keyboard activated, press command area and type in the command string as follows:

Press the CONTINUE button and SAVE the method

enter: COLUMN DRAIN

enter: DISPENSE H2O(1) 10

■ OPEN

Opens directory where previous methods were saved MyComputer\LocalDisk(C)\HardDisk\Methods\

Select the **OPEN** button

Select a method from the directory

Press the OK button

■ SAVE

Save a new or edited method.

Select the **Save** button and activate keyboard

Type method name in FILE NAME area, Press OK button

Methods are stored in this directory MyComputer\LocalDisk(C)\HardDisk\Methods\

■ NEW

Clears the method command area enables operator to program commands to a new method

Select the **NEW** button

The methods field clears

■ EDIT

Allows the operator to modify current methods.

Method command area must have commands programmed on the screen

Select the **EDIT** button

Highlight the command to edit, activate the keyboard to make changes.

Cancel

You have canceled the command & return to the main PROGRAM TAB

Continue

Saves the change and returns to the main PROGRAM TAB to continue programming

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AutoBlock

PROGRAM TAB

■ IMPORT/EXPORT METHOD

Methods are stored in this directory MyComputer\LocalDisk(C)\HardDisk\Methods\
Methods are saved by METHOD NAME.TXT file example: 200.7 WATERS 50ML.TXT

Methods can also be written using notepad or word. Save as a text file (.txt) onto a USB stick
Basic operator knowledge of Microsoft Windows is required
Insert USB stick into USB slot near the touch screen

IMPORT

There are two ways to import methods

1. From the PROGRAM TAB, press OPEN button
Select MY COMPUTER from the side icons
Select TRAVELDRIVE (D:) and press the OPEN button
Select METHODS and press the OPEN button
Select method to import and press the OK button
Save the method using the SAVE procedures on the previous page
2. Press the START tab on the task bar
Select MY COMPUTER from the side icons
Select TRAVELDRIVE (D:) and press the OPEN button
Select method
Using the EDIT, COPY TO FOLDER
Select MyComputer\LocalDisk(C)\HardDisk\Methods, press the COPY button

EXPORT

There are two ways to export methods

1. From the PROGRAM TAB, open the method to be exported
press SAVE button
Select MY COMPUTER from the side icons
Select TRAVELDRIVE (D:) and press the OPEN button
Activate the keyboard, type method name in FILE NAME area
Press OK button
2. Press the START tab on the task bar
Select MY COMPUTER from the side icons
Double click LOCAL DISK(C)
Double click HARDDISK
Double click METHODS
Select method to export
Using the EDIT, COPY TO FOLDER
Select TRAVELDRIVE (D:), press the COPY button

■ EXPORT LOG

Logs are stored in this directory MyComputer\LocalDisk(C)\HardDisk\Data\
Using the same procedure for Exporting Methods extracting method logs from the DATA directory.
Data logs are saved by MethodName.TXT Hour_Minute Month_Day_Year. DAT file

example: 200.7 WATERS 50ML.TXT12_30_FEB_01_09.DAT

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AutoBlock

PROGRAM TAB

■ SYNTAX ERRORS

Run Tab

Select the method(s) and columns to run

Press RUN METHODS button

If there is an error in the method programming a popup will appear, note what syntax occurs
syntax error will appear with the following format:

SYNTAX ERROR# -COMMAND

definition and description

- 10 value out of range
- 20 unrecognized command
- 30 reagent not recognized
- 40 loop must execute at least 1 time
- 50 loop must use a *stop loop* command
- 60 elevator command must use *up* or *down* to specify location

The method will not continue until the syntax error is fixed in the program.

Return to the Program Tab, open the method and edit. SAVE the method before returning to the Run Tab

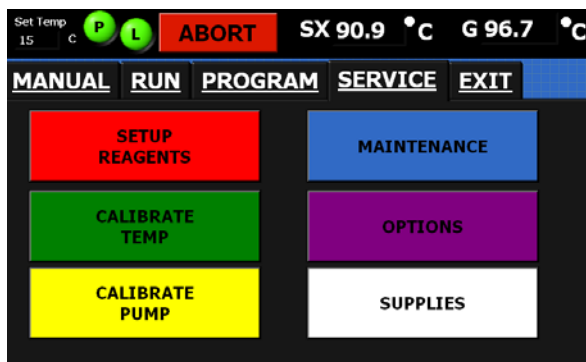
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AutoBlock

SERVICE TAB

The SERVICE TAB is set up for AutoBlock to be calibrated, maintained, and custom levels set for optimal performance.



service tab screen

Setup Reagents

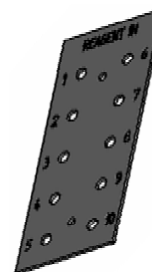
Select SETUP REAGENTS button from the SERVICE TAB

Reagents are set to correspond with reagent ports. AutoBlock reagent ports are located on the left side of AutoBlock, labeled #'s 1-10. The reagents have been set up in the following manner:

Single System		Dual System**	
*Port #1	H2O(1)	*Port #6	H2O(6)
Port #2	HNO3(2)	Port #7	KMnO4(7)
Port #3	HCL(3)	Port #8	PERSUL(8)
Port #4	H2O2(4)	Port #9	NH2OH(9)
Port #5	H2SO4(5)	Port #10	H2O(10)

*Ports #1 & #6 must remain H₂O

**In a single system ports #6-10 have been plugged.



If the reagent arrangement or if other reagents are used, you may change the list. In the following steps. Listed below are common reagents with viscosity ratings.

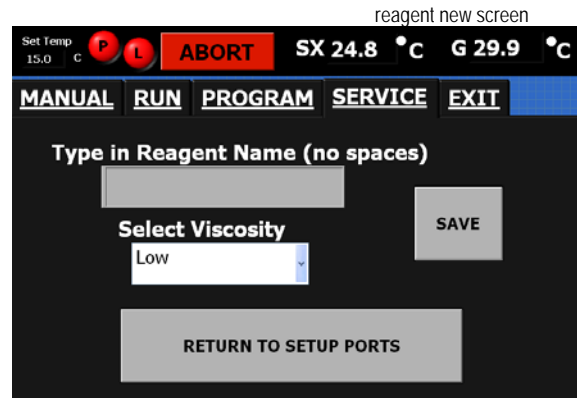
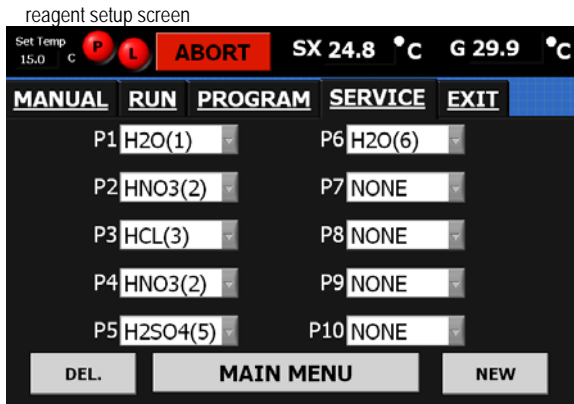
<u>Reagent</u>		<u>Viscosity</u>
H2O(1)	(ports 1 & 6, cannot be changed)	Low
HNO3(2)	Nitric Acid	Medium
HCL(3)	Hydrochloric Acid	Low
H2O2(4)	Hydrogen Peroxide 30%	Medium
H2SO4(5)	Sulfuric Acid	High
H2O(6)	(ports 1 & 6, cannot be changed)	Low
KMnO4(7)	Potassium Permanganate	Low
PERSUL(8)	per sulfates	Low
NH2OH(9)	Hydroxylamine	Low
H2O(10)	Water	Low

Viscosity ratings control the pump speed to maximize efficiency and provide volume delivery accuracy.
Low Viscosity, fast pump speed, (reagent near the viscosity of water)
High Viscosity, slow pump speed

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SERVICE TAB



Setup Reagents continued

- Selecting a different reagent on a port:
 - After selecting SETUP REAGENTS button from the SERVICE TAB use the pull down menu on the port by pressing the arrow ▼ button.
 - Select the reagent from the list.
- To add a reagent to the pull down menu, you are able to add your own.
 - Select the **New** button from the screen. A new screen will appear, input information needed.
 - Reagent**
With the keyboard activated, press reagent area and type in *Reagent Name*(port#)
No spaces allowed
Example: HCL(3) Reagent Name:HCL used on Port #3
 - Viscosity**
Select the pull down menu by pressing the arrow ▼ button, choose *Low, Medium, High*.
 - SAVE** the input information.
 - A pop up message will appear: "NEW REAGENT ADDED." Press **Continue**
 - Select RETURN TO SETUP PORTS button to return to the setup screen
- To deleted a reagent on the pull down menu.
 - Select the **DEL** button from the screen. A new screen will appear, input information needed.
 - Reagent**
Select Reagent to be Deleted from the pull down menu by pressing the arrow ▼ button
Choose *Reagent Name*, the viscosity associated with the reagent will appear in the Viscosity of Reagent box
 - DELETE** the reagent information
 - A pop up message will appear: "REAGENT DELETED." Press **Continue**
 - Select RETURN TO SETUP PORTS button to return to the setup screen
- To change a reagent information on the pull down menu. (name change or viscosity rate)
 - You will need to add a new reagent & delete the old reagent

Select **Main Menu** button to return to the SERVICE TAB. By selecting the Main Menu button, the new port selection has been saved.

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SERVICE TAB

Calibrate Temp

The Graphite Block has been tested and calibrated during manufacturing to ensure a +/-2 °C variation in temperature range.

The graphite block temperature needs calibration if a large variation is noted.

Consult Environmental Express before calibrating.

After selecting the Calibrate Temp button

-A pop up message will appear:

"DO YOU WANT TO CALIBRATE THE GRAPHITE BLOCK? YOUR OLD CALIBRATION TEMPERATURE WILL BE LOST." Press **Continue** or **Cancel** button.


Cancel

You have canceled the command & return to the Calibration screen

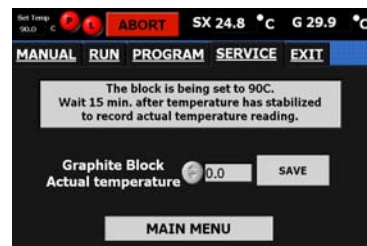
Your current calibration temperature will show in the actual temperature box

Continue

-A pop up message will appear: *"THE BLOCK IS BEING SET TO 90°C. WAIT 15MIN AFTER TEMPERATURE HAS STABILIZED, RECORD ACTUAL TEMPERATURE READING"*

- After the graphite Block temperature reaches 90°C, let the temperature stabilize for 15 minutes.
- Record the actual graphite block temperature with an infrared thermometer.
- Enter the **G** readout in the Graphite Block Actual Temp. This may be done with the UP or DOWN buttons  or by using the keyboard. (°C)
- **SAVE** the input information.

Select **Main Menu** button to continue back to the SERVICE TAB screen.



calibrate temp screen

Calibrate Pump

To maintain an accurate injection volume and viscosity rating, the pump requires calibration.

Contact Environmental Express for an Excel worksheet to calibrate injection tubing. Set the initial length of tubing to 108".


Note: Check all lines for air bubbles & clogs before calibrating

Calibrate Injection Tubing

1. Label each vessel 1-6. Weigh six dry, clean test tubes, record weight in chart.
2. Place test tubes in order #1-6, from front to back into a rack. In the MANUAL TAB, place in rack C position and raise the rack.
3. Prime the line with 6ml of H₂O.

INJECT field (green section)

Amount

Set the volume to 6ml, by changing the amount of reagent with the UP or DOWN buttons 

Reagent

Select the **H₂O(1)** to be injected.

With injection arm over the drain, press the **INJECT** button

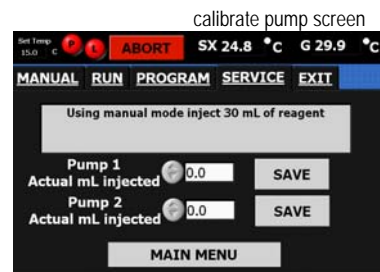
4. After the lines have been primed, Move the **ARM** (red section)

Set the position of the arm location over the test tubes, by selecting the correct column from the **Column L** drop down menu

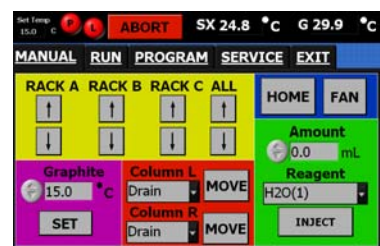
Press the **MOVE** button

5. Change the **Amount** of volume to 30ml (green section)

Press the **INJECT** button



calibrate pump screen



manual tab screen

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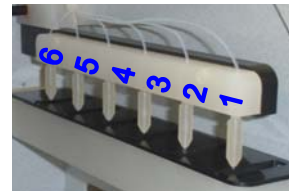
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AutoBlock


SERVICE TAB

■ Calibrate Pump continued

6. After the reagent has injected 30ml.
After the lines have injected, Move the **ARM** (red section) over the drain, by selection from the **Column L** drop down menu
Press the **MOVE** button



single unit system shown
dual unit has two splitters

7. Re-weigh each test tube and record the total weight (tube +H₂O)
8. Average range is 2%
 - When the average range reaches 0-2%, you are ready to calibrate the pump(s).
Reference SERVICE TAB section on pump calibration
 - If the target range exceeds $\pm 2\%$, refer to the *Amount Trimmed* column.
This is the amount of tubing that needs to be cut off to the corresponding row.
 - a. Pull the tubing from the nozzle.
 - b. Measure the amount to be cut, refer to the *Amount Trimmed* column
Cut each tubing with a tube cutter
8. Dry test tubes and repeat steps 3-5 until the target range reaches $\pm 2\%$
9. Return to the **Service Mode** tab and select **Calibration Pump** button.
10. Under the heading, Pump1 actual ml injected, enter value by using the UP or DOWN buttons  or by using the keyboard. (ml).
This value is obtained from the Calibrate Injection Tubing worksheet. Reference the *min-max-middle* values. Use the MIDDLE value for the pump1 actual ml injected.
11. **SAVE** the input information.

Select **Main Menu** button to continue back to the SERVICE MODE screen. By selecting the Main Menu button, the new calibration has been saved.

In a dual system, the second injection arm tubing is calibrated in the same manner, except using **H₂O(6)** and **Arm(6-10)**.

AutoBlock

SERVICE TAB

Maintenance

This section is designed to remind the operator when it is time for replacement of parts or calibration of processes.

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. Please review the warranty section of this manual.

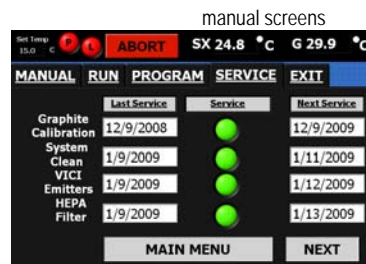
After selecting the MAINTENANCE button, there are several items to be addressed on (3) pages. Next to each maintenance item shows: date last serviced - service indicator - next service date

Maintenance items that need addressing are:

Graphite Calibration	Teflon Tubing Pump 1	Teflon Tubing Pump 2
System Clean	Pump Tubing 1	Pump Tubing 2
VICI Emitters	Pump Calibration 1	Pump Calibration 2
HEPA Filter	Check Waste Drum	

After service has been completed double click the **SERVICE** button to update the screen. This will change the button from red to green and change the service dates.

Select MAIN MENU button to continue back to the SERVICE TAB screen. By selecting the Main Menu button, the new information has been saved before continuing onto the next/previous page.




this third screen is only shown in a dual system

Options

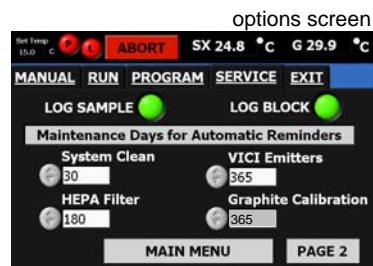
AutoBlock comes with 2-pages of recommended preset features. Recommended service days may be changed by the operator to increase or decrease based on usage and standard laboratory protocol. Time entered is in days.

Options included:

By selecting the UP or DOWN button  each item will change its current value

Recommended service days have already been provided.

Automatic Reminders	service (days)
System Clean	30
HEPA Filter	180
VICI Emitters	365
Graphite Calibration	365
Fan Speed	100%
Pump Tubing	365
Teflon Tubing	365
Pump Calibration	30
Waste Drum	30



Select MAIN MENU button to save data & continue back to the SERVICE TAB screen.

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AutoBlock

SERVICE TAB

■ Supplies

Call Environmental Express for all your AutoBlock supplies. Have your AutoBlock serial number with you, this is located in the back of the unit and inside the exhaust compartment.

After selecting the SUPPLIES button, Environmental Express contact information will appear.

ENVIRONMENTAL EXPRESS

490 Wando Park Blvd.
Mt. Pleasant, South Carolina 29464

Tel 800-343-5319
Tel 843-881-6560
Fax 843-881-3964
Email INFO@EnvExp.Com

The current software version that is running on this AutoBlock unit will appear at the bottom of screen.

Press SPARE LIST button

A scroll down list of supplies will appear. There is also a supplies list in your manual.

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Supplies

Call Environmental Express for all your AutoBlock supplies.
 Have your AutoBlock serial number with you; this is located in the back of the unit and inside the exhaust compartment.

ENVIRONMENTAL EXPRESS

490 Wando Park Blvd.
 Mt. Pleasant, South Carolina 29464

Tel 800-343-5319 or
 Tel 843-881-6560
 Fax 843-881-3964
 Email INFO@ENVEXP.COM

P/N	DESCRIPTION	QTY per package
ABP103	VICI Emitter Disk	4
ABP104	Pump to Motor Coupling set	2pc
ABP105	Tygon Tubing for Waste Line	10'
ABP106	Teflon Line for Uptake	25'
ABP107	Replacement Solenoid	1
ABP108	Manifold w/Plug	1
ABP120	Pump Motor Assembly	1
ABP121	Heater Mat Assembly	1
ABP122	5-Valve Assembly	1
ABP123	Lift Motor Assembly	1
ABP124	Injection Arm Motor Assembly	1
ABP125	Photo Sensor Assembly	1
ABP127	Leak Detector Assembly	1
ABP128	Exhaust Fan Assembly	1
ABP129	RTD-Block Assembly	1
ABP130	RTD-Sample Assembly	1
ABP140	Reagent-Valve Tubing Kit (single)	1
ABP141	Reagent-Valve Tubing Kit (dual)	1
ABP143	Sample Injection Kit	1
ABP144	Pump Tubing Kit	1
ABP145	Insulation Kit, 9pc set	1
ABP149	10L Carboy w/Cap & Fitting	1
ABP150	Thumbs Screw	3
ABP151	HEPA Filter	1
ABP152	Pressure Sensor	1
ABP153	Drain Tubing Kit	1
ABP154	Pump Head	1
ABP159	Injection Guide	6
ABP163	54-well Rack, 18-position	3
ABP164	On/Off Switch	1
ABP171	Power Cord	1

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AUTOBLOCK

AutoBlock

EXIT TAB

EXIT

Closes the program, shutting down the system and saving data

Select the blue **EXIT** button in the center of the screen

-A popup message will appear: "SAVING DATA BEFORE EXIT. THIS WILL TAKE A FEW MINUTES."

-Select the **Continue** button.

When the AutoBlock software has finished exiting the top row of the screen will change



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AutoBlock

■ Warranty

The Environmental Express AutoBlock is warranted to heat, hold temperature, automatically add reagents, Warranty lift racks, cool samples with air flow and perform the stated functions of the touch screen controller for a period of ONE YEAR. This 1-year warranty is divided into two sections as follows:

90-Day Warranty

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

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.

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.

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 maintenance section instructions.

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. The AutoBlock will be returned to Environmental Express in its original shipping container.

ENVIRONMENTAL EXPRESS

For technical support call 1-800-745-8218 or send email to INFO@ENVEXP.COM

AutoBlock

■ 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.

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 800-343-5319 or (1-843-881-6560 outside the US) to obtain approval before beginning any repair work.

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.

Repair by Manufacturer

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

Obtain a Return Authorization Form and Number

1 Coordinate shipment and insurance with Environmental Express

2 Properly pack* the AutoBlock in *approved materials only**

3 Place a Purchase Order with Environmental Express for repair

These elements are critical to a successful repair experience.

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 the receipt of the AutoBlock. If the original shipping container is not available, a new shipping container must be purchase from Environmental Express prior to shipment. Shipping charges and insurance from your lab to Environmental Express, and return shipment charges via standard trucking line will be the responsibility of the lab except for approved 90-day warranty claims.

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 cost to and from the laboratory.

Additional Information & Help

If you have any questions or concerns do not hesitate to pick up the phone and call 800-343-5319 or (1-843-881-6560 outside the US). Standard hours of operation are 8:30am-5:30pm EST-Monday through Friday excluding holidays. You can email questions to INFO@ENVEXP.COM at any point. Please include you name, company name & telephone number. A technical service representative will respond as quickly as possible. This manual addresses issues normally seen in the field.

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