StirBase™

Operation & Instruction Manual

ENVIRONMENTAL EXPRESS

Call 800.343.5319 or 843.881.6560 ▪ www.environmentalexpress.com

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Dear Valued Customer,

Thank you for purchasing a StirBaseTM from Environmental Express. We pride ourselves on providing innovative products designed to improve accuracy, efficiency, and safety in your laboratory. Please take some time to read your product manual before using your StirBaseTM.

As always, our Technical Sales and Technical Support Teams are available to assist with any questions you have regarding our products.

Best Regards,

Al Jurgela
Chief Executive Officer
Environmental Express, Inc.

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Congratulations on the purchase of your StirBase™ from Environmental Express.

This unit can be used for performing Hexavalent Chromium in soils, some pharmaceutical dissolutions, and other methods that require both heating and mixing of samples.

WARNING!!!

- Be advised that the StirBase™ Stirrer has very strong magnetic fields coming from a 48 MGO Neodymium Iron Boron drive magnet.
- People with pacemakers should not get closer than 24 inches.
- Remove all magnetic influenced tools and objects from the immediate area to prevent them from being pulled onto the magnet or from striking anyone as the objects are pulled towards the magnet.
- Keep credit cards, watches and other magnetic sensitive items at least 24 inches from the StirBase™ Stirrer's magnetic fields.
- Do not operate the StirBase™ Stirrer in the close proximity to large pieces of aluminum or ferromagnetic material. For more information see StirBase™ Installation section, page 2.

The StirBase™ can also be used as a large stirring surface (15.5" x 22") to agitate multiple glass beakers for other laboratory applications.

Limited Warranty

The StirBase™ and controller are warranted against defects in materials and workmanship when used in accordance with applicable instructions, for a period of one year from the date of shipment. This warranty extends to parts, labor, and any approved transportation charges. This warranty applies only to damage or failure caused by normal laboratory use. The warranty is limited to product repair. If Environmental Express, Inc. is unable to repair the StirBase™, the customer may, at his or her option, receive a replacement unit or a full refund. Operating the StirBase™ controller inside a fume hood (thus causing corrosion) will void the warranty.

Environmental Express, Inc. makes no other warranty, expressed or implied for this product with respect to merchantability, fitness for a particular use or any other matter. Environmental Express, Inc. is not liable for any consequential or compensatory damages arising from use of, or in conjunction with, this product. The maximum liability shall be the invoice price of this product.

Product Maintenance

General Product Care

When not in use, turn the power switch off. Do not place the control unit in chambers with temperatures above 40º Celsius. The deck of the StirBase™ is made of ABS. To clean the deck use a mild detergent followed by a water rinse. For chemical compatibility of ABS please see the following link for more information: http://www.coleparmer.com/techinfo/chemcomp.asp

Fuse Replacement

The StirBase™ motor is powered by a Multi-Drive™ Solid State DC Motor speed controller, which is manufactured by KB Electronics, Inc. The controller is powered by 115/230 VAC at 50/60 Hz. Please refer to the KB Control Installation and Operating Instructions (see attached document) before operating the controller. The controller contains two fuses to protect against over-current. The first one is an AC in-line fuse for the speed controller located on the right rear of the circuit-board. The other is a DC output fuse on the controller, located on the left rear of the circuit board. The AC in-line fuse should be a FAST-ACTING 250V ABC 10A fuse while the DC out-line fuse should be a SLOBLO 250V MDL 5A fuse. A set of spare fuses is located in a bag taped to the inside cover of the controller. To access, remove the two screws located on the top cover and lift the cover.

Use of the SC168 Stir Bars from Environmental Express is recommended for both the 50mL and 100mL style HotBlocks™ on this product.

Disassembling the StirBase™ will void any and all warranties whether written or implied.

For technical assistance with your StirBase™ please call 1-800-745-8218.

Setup

StirBlock Stirrer Installation

Caution: Operating the StirBase™ in close proximity of ferromagnetic or aluminum materials, or both, is not recommended.

We recommend that the StirBase™ Stirrer be installed as far away from ferromagnetic material as possible. The closer and larger the magnetic material is to the StirBase™ Stirrer, the greater the torque that is required and the slower the maximum speed will be.

Placement on a sturdy bench top or table is also recommended. Thick aluminum table tops or robot decks, as well as racks or holders, should be avoided. Although aluminum is not magnetic it will cause a drag on the magnetic field due to eddy currents being formed when magnetic flux lines pass through it. A large mass of aluminum will cause a significant drag and result in undue strain on the motor. This strain causes the motor to overheat (>60ºC) which could burn out the motor. This is not covered under Environmental Express' warranty for this product.

Operation

Operating the Controller

The controller must be located outside of a fume hood in an ambient clean air environment.

The maximum speed is set at the factory to 2150 RPM with no load and the speed control knob set to 100. Because the load (magnetic resistance) will directly affect speed, it is not possible to accurately relate the dial setting to speed (RPM) in every situation. In general, the speed control knob has to be set to at least 20 to overcome inertia. If the stirrer is placed near a ferromagnetic object, a higher dial setting is required to overcome inertia. Once the optimal stirring speed has been determined, note the position and leave the speed control knob set to that position.

The control unit for the stirrer has an ON/OFF power switch and a speed control knob. Place the power switch in the ON position (toggle up) and adjust the speed control knob to change the operating speed of the StirBase™ Stirrer. The speed control for the Stirrer is designed to control the speed and to gradually take the unit from the OFF position to the set speed in a gradual acceleration. The speed control knob should not be used to stop the motion of the Tumble Stirrers. To stop the Tumble Stirrer always flip the power switch to the OFF position (toggle down).

Operating the StirBase™

The optimal operating speed of the StirBase™ Stirrer is dependent upon the particular application to be used and needs to be empirically determined. Factors to consider in determining optimal stir speed are the fragility of the objects being stirred; size, shape, and composition of the test tube, vial, or bottle (polypropylene or polystyrene); depth of the microplate wells; volume and viscosity of the liquid; and the type of stir disc or bar used.

Caution: Operating the StirBase™ for extended periods of time or with challenging loads is not recommended.

Adaptation for EPA Method 3060A for use with the Environmental Express HotBlock™ and StirBase™ Digestion System

1.0 Scope and Application

1.1 The following procedures have been written as an aid to EPA Method 3060A for use with the Environmental Express HotBlock™ and StirBase™. EPA Method 3060A is an alkaline digestion procedure for extracting hexavalent chromium [Cr(6+)] from soluble, adsorbed, and precipitated forms of chromium compounds in soils, sludges, sediments, and similar waste materials. Use EPA Method 3060A for reference while following the sample preparation steps outlined below. The quantification of Cr6+ in Method 3060A digests should be performed using a suitable technique with appropriate accuracy and precision.

2.0 Apparatus and Materials

2.1 HotBlock™ for sample digestion – Model Numbers SC100, SC154, SC150, or SC151

2.2 StirBase™ stirring device – Catalog Number SC160

2.3 Polypropylene Digestion Vessels – Catalog Number SC475 (or SC490 for use with the SC150 or SC151 HotBlocks™)

2.4 Ribbed Watch Glasses – Catalog Number SC505 (or SC610 for use with the SC150 or SC151 HotBlocks)

2.5 Reflux Caps – Catalog Number SC506 (used as an alternative to the SC505 only)

2.6 Stir Bars – Catalog Number SC168 10/pk (each StirBase™ comes standard with 6 packs of 10)

2.7 FilterMate ™– Catalog Number SC0407 (or appropriate FilterMate™) for sample filtration if necessary

2.8 FlipMate™ – Catalog Number SC0301 (or appropriate FlipMate™) for sample filtration if necessary

3.0 Procedure, Solid Sample Preparation

3.1 Place 2.5 +/- 0.10 g of the field-moist sample into a clean and labeled digestion vessel. Mix the sample thoroughly before the aliquot is removed.

3.2 For the specific sample aliquot being spiked, the spike material should be added directly to the sample aliquot at this point.

3.3 Add 50 mL +/- 1 mL of digestion solution to each sample using a graduated cylinder, and also add approximately 400 mg of magnesium chloride and 0.5 mL of 1.0M phosphate buffer. For analytical techniques that can correct for oxidation/reduction of Cr, the addition of Mg(2+) is optional. Cover all samples with watch glasses or reflux caps.

3.4 Stir the samples continuously (unheated) for at least five minutes using the StirBase™.

3.5 Heat the samples to 90 - 95ºC, then maintain the samples at 90 - 95ºC for at least 60 minutes with continuous stirring.

3.6 Gradually cool, with continued agitation, each vessel to room temperature.

3.7 Filter each sample using a 0.45µm FilterMate™ or FlipMate™.

3.8 Adjust the pH of the digestate accordingly to the method being used for analysis.

3.9 Adjust the sample volume to 100mL with reagent water. Mix well. The sample digestates are new ready to be analyzed.

All QC samples, concentration limitations, interferences, and reagent specifications are addressed in depth in EPA method 3060A. Safety concerns are also part of the full method. Follow the instructions listed in EPA method 3060A. These steps should only be used as a guide to help improve the performance of your HotBlock™ and StirBase™.