OPERATING INSTRUCTIONS FOR VP 710C1ALPFX SERIES - ROTARY TUMBLE STIRRERS

CAUTION!!!!!

Be advised that the Tumble Stirrer has a very strong magnetic field. People with pacemakers should not get closer than 18 inches. Remove all magnetic influenced tools and objects from the immediate area to prevent them from being pulled onto the magnets or from striking people as they are pulled onto the magnets. Keep credit cards, watches and other magnetic sensitive items at least 1 foot from the Tumble Stirrer's magnetic fields.

The proper operating speed of the Tumble Stirrer is dependant upon your particular application and needs to be empirically determined for your application. The Maximum speed set at the factory is 2150 RPM when the knob is set to 100 and there is no load. 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 most cases the 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 you have determined the optimal stirring speed, note the position and leave the speed knob set to that position. Factors to consider in determining optimal stirring speed are the fragility of the objects being stirred, size, shape, composition of the well (polypropylene or polystyrene), depth of the micro-wells, volume and viscosity of the liquid, and the type of stir element (disc, bar, dowel or Stir StiX used).

In general, stirring microbial cultures works best at low speeds and thus the Rotary Tumble Stirrer is well suited for this type of application since it can function at minimum RPMs. Stirring to resolubilize extracts, or to stir in 96 deep well microplates, requires high speed. The Rotary Tumble Stirrer is equally as effective in this role as it will also operate at high RPM. Again the speed of stirring needs to be determined empirically for your particular application.

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), adjust the speed control knob to change the operating speed of the Tumble 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 ramp up. The speed control knob should <u>not</u> be used to stop the motion of the Tumble Stirrers. To stop the Tumble Stirrer always flip the power switch to the stop position (toggle down).

The tumble stirrer's deck is designed to attach to an FXALP deck plate. Also, there is a drawing attached which shows hole locations on the stirrer deck and how they relate to the FXALP footprint. Mounting screws are also included. The stirrer has an adjustable (z) shim that supports the weight of the motor on the Beckman FX workstation.

The VP 710C1 series Stirrers are powered by a powerful brush type DC servo motor. Occasionally the brushes need to be changed. When not in use, turn the power switch off. Do

not place the control unit in chambers with temperatures above 40°C. We have provided extra fuses in the rare event that they blow. The extra fuses are inside the control unit. Each Magnetic Tumble Stirrer is covered by a one year factory warranty for parts and labor.

Fuse Replacement

The VP 710C1-ALPFX 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 (attached) before operating the controller.

The controller contains two fuses to protect against over-current. There is one AC in-line fuse for the VP710C1 controller which is located on the right rear of the circuit-board (see Page 5 of the controller operating instructions). The AC in-line fuse should be a **FAST-ACTING 250V ABC 12A** fuse. There is also one DC output fuse on the KB Controller, which is located on the left rear of the circuit board (see page 5 &13 of the controller operating instructions). The DC out-line fuse should be a **SLOW-BLO 250V MDL 5A** fuse.

A set of spare fuses is located inside a bag taped to the inside top cover of the controller.

For any other questions regarding the controller, please refer to the KB Control Installation and Operating Instructions.