



V&P SCIENTIFIC, INC.
*Innovators in Liquid Handling,
Arraying and Mixing*



**OPERATION AND CARE MANUAL
FOR
V&P SCIENTIFIC ALLIGATOR TUMBLE STIRRER***

CAUTION!!!!!!

Be advised that the Super Alligator Tumble Stirrer has very strong magnetic fields. People with pacemakers should not get closer than 15 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 2 feet from the Tumble Stirrer's magnetic fields.

OPERATION

We recommend that you install the Tumble Stirrer as far away from magnetic material as possible as the closer and larger the magnetic material is to the Tumble Stirrer the more torque that is required and slower the maximum speed will be.

OPERATING THE CONTROL

The PACESETTER™ “NANO” inverter is factory-set for operation using the push button keypad. Use the following procedure to start the motor and adjust speed.

1. Turn the AC power ON. The LED display will illuminate and show the current setting for output frequency. The power light just to the left of the LED display will also illuminate.
2. Press the button labeled “RUN/STOP.” The display will change to show actual output frequency, which will start at “000” and ramp up to the set frequency. Simultaneously, the motor will start and accelerate.
3. Press the button labeled “▲” to increase the output frequency. The motor will accelerate until the “▲” button is released. Note that the output frequency changes at a progressively faster rate the longer you hold the button down. Press the “▼” button to decrease the output frequency.
4. Press the button labeled “RUN/STOP” again to stop the motor.
5. If the motor does not start promptly and run smoothly, refer to “TROUBLESHOOTING.” in Appendix A.

OPERATING SPEED

The operating speed of the Tumble Stirrers is dependent upon your particular application and needs to be empirically determined for your application. Once you have determined the optimal stirring speed, note that number and leave the display set to the number. Factors to consider in determining optimal stir speed are the fragility of the objects being stirred, size, shape, composition of the well (polypropylene or polystyrene), depth of the microwells, volume and

viscosity of the liquid, and the type of stir disc, stix or bar used.

In general, stirring microbial cultures works best at low speeds. Stirring to resolubilize extracts or to stir in deep well microplates, or to resuspend beads with the Bubble Paddle Reservoirs requires high speeds. Again the speed of stirring needs to be determined empirically for your particular application.

The motor is set at the factory to deliver a top speed of 828 RPM which corresponds to a frequency setting on the control of 60. The correlation between frequency and RPM is ~1 to 14.5, so just multiply your frequency on the control by 14.5 to determine the RPM. It is possible to set the frequency limit higher to get faster speeds. This also results in less torque and more work for the motor. In applications with moderate motor load we do not recommend going faster than 828 RPM. The highest speed we recommend at minimal load is 2000 RPM at 137 HZ.

VP 710E SERIES	RPM	HZ		RPM	HZ
	0	0.0		700	47.8
	10	0.7		750	51.3
	20	1.4		800	54.7
	30	2.1		850	58.1
	40	2.7		900	61.5
	50	3.4		950	64.9
	60	4.1		1000	68.3
	70	4.8		1100	75.2
	80	5.5		1200	82.0
	90	6.2		1300	88.8
	100	6.8		1400	95.7
	150	10.3		1500	103
	200	13.7		1600	109
	250	17.1		1700	116
	300	20.5		1800	123
	350	23.9		1900	130
	400	27.3		2000	137
	450	30.8			
	500	34.2			
	550	37.6			
	600	41.0			
	650	44.4			

CARE

When not in use, turn the power switch off. Do not place the control unit in chambers with temperatures above 40C. The Tumble Stirrer motor is an AC Inverter motor and requires no maintenance.

We have provided extra fuses in the rare event that they blow.

If technical assistance is required, contact:

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San Diego, CA 92121
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WARRANTY

There is a one-year warranty against defective parts. We will replace or repair the defective part and not charge a Labor fee. Damage to the machine caused by user negligence is not covered. We ask that you keep the special shipping carton in case you need to send the unit back to us.

SPECIFICATIONS AND CAUTIONS

The VP 710series Alligator Tumble Stirrers are driven by a heavy duty three phase, inverter duty, non-synchronous, parallel shaft, 1/6 horsepower, induction gear motor, manufactured by Bodine Electric Company. This motor was selected primarily because of its ruggedness and reliability. The control for this motor is a Bodine adjustable speed drive - PACESETTER™ “NANO”. It is a PWM type inverter that accepts single-phase AC input voltage and converts it to an adjustable frequency three phase AC output voltage. Since the speed of AC induction motors is proportional to the line frequency, adjusting the output frequency of the inverter enables adjustable speed operation of the motor. At output frequencies below the motor’s rating, the PACESETTER™ “NANO” series inverter simultaneously adjusts applied voltage to the motor so that it is proportional to the applied frequency. This prevents stator saturation and the resultant overheating. At output frequencies above the motor rating, the applied voltage is held constant, so torque output from the motor is proportionately lower at higher frequencies. If the equipment is used in a manner not specified by V&P SCIENTIFIC, INC., the protection provided by the equipment may be impaired.

NANO Inverter Specifications

Input Voltage:	200 to 240 VAC +10%/-15%, 50/60 Hz +/-5%, Single Phase		
Maximum Output Voltage:	200 to 240 VAC +10%/-15%, Three Phase		
Output Frequency:	0 to 120 Hz		
Max. Output Current, Model 2702:	Continuous: 1.4A rms		
Max. Motor Power Rating: Model 2702:	¼ HP (0.19 kW)		
Ambient Operating Temperature:	-10°C to 40°C		
Humidity:	0 to 95% Noncondensing		
Vibration:	<1G (9.8 m/s ²)		
EMC level:	Class A (models 2702, 2712, and 2722 only)		
Enclosure rating:	IP 20		
Safety Approval:	CE rated, UL Listed		
Dimensions, Width X Height X Depth:	2.83" x 5.20" x 4.64" (72mm x 132mm x 118mm)		
Weight: Model 2702:	1.7 lb (0.76 kg)		

Additional Tumble Stirrer Specifications

Equipment Rating	230V~, 1.6A, 50/60 Hz
Ambient Environment:	Indoor use, Altitude up to 2000 m, supply voltage not to exceed ∇ 10% of nominal, Installation Category II and Pollution Degree 2.
Safety Approval:	CE rated, UL Listed

The use of motor controls, like that of all utilization of concentrated power, is potentially hazardous. The degree of hazard can be greatly reduced by proper design, selection, installation, and use, but all hazards cannot be completely eliminated.

The following safety precautions must be observed during all phases of installation, operation, service, and repair of this motor control product. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture and intended use of the products. V&P Scientific assumes no liability for the customer's failure to comply with safety requirements and practices.

Throughout this manual, and the NANO Operators Users Manual, (Appendix A) a WARNING will highlight a procedure, which presents potential danger to people, and a CAUTION will highlight a possible danger to equipment. Both types of instructions must always be followed.

WARNING

- Do not touch the PCB or components on the PCB right after turning off the power. Wait until the power indicator turns off or at least

WARNING

- seven minutes.
- Do not attempt to wire circuitry while power is on. Do not attempt to examine the components and signals on the PCB with the inverter operating.
 - Do not attempt to disassemble or modify internal circuitry, wiring, or components of the inverter.
 - The grounding terminal of the inverter must be grounded properly with 200V class type III standard.

CAUTION

- Do not attempt a dielectric strength test to internal components of the inverter. They are sensitive semiconductor-devices vulnerable to high voltages.
- Do not connect the output terminals T1(U), T2(V), and T3(W) to an AC power outlet.
- The CMOS IC on the primary PCB of the inverter is vulnerable to static electrical charges. Avoid contact with the primary PCB of the inverter.

WARNING

Do not remove the cover of the inverter when the power is ON to avoid personnel injury caused by electrical shock.

CAUTION

Do not disconnect motor during operation. Otherwise, inverter overcurrent breakdown may result.

FOOTNOTE

The above operating instructions apply to operating the Alligator Tumble Stirrer unit in the “Basic” mode. For information on connecting the NANO control to external devices or on changing the programmable functions of the NANO, refer to “Advanced Installation & Operation” in Appendix A

APPENDIX

A. Instructions for Installation and Operation of PACESETTER Adjustable Speed Drive