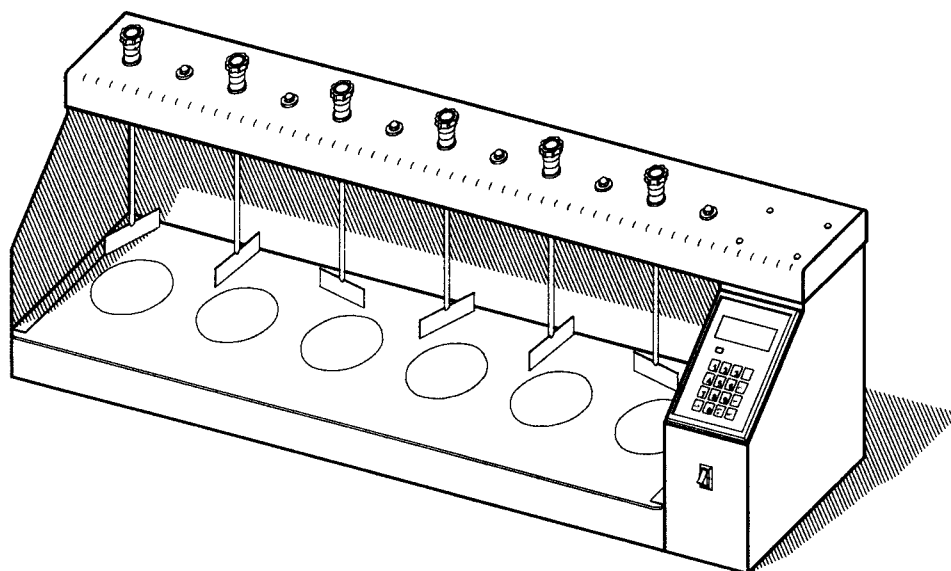


# PB-900™

Programmable Jar Tester



## Instruction Manual

### CAUTION:

**DO NOT** CONNECT THE EQUIPMENT TO A SOURCE OF ELECTRIC POWER AND **DO NOT** ATTEMPT TO OPERATE THE EQUIPMENT UNTIL THE INSTRUCTION MANUAL HAS BEEN READ AND UNDERSTOOD. PLEASE CONTACT PHIPPS & BIRD IF YOU HAVE ANY QUESTIONS ABOUT THE EQUIPMENT.



Richmond, VA 23221-0475 U.S.A.



## A STATEMENT ABOUT OUR LIMITED WARRANTY

PHIPPS & BIRD is proud of its reputation as a manufacturer of dependable products.

If you should experience any difficulty with our products, just telephone, fax or write. We'll make every reasonable effort to resolve the difficulty to your satisfaction within the terms of our WARRANTY. You may contact Phipps & Bird at:

|                   |   |                        |  |
|-------------------|---|------------------------|--|
| Shipping Address: | 1519 Summit Ave.<br>Richmond, VA 23230-0475 | Via Phone:             |  |
| Mailing Address:  | P. O. Box 7475<br>Richmond, VA 23221-0475   | Inside U.S. Toll Free: | 800/955-7621   |
| E-mail address:   | phippsbird@aol.com                          | Outside U.S.:          | 804/254-2737   |
|                   |   | Via fax machine:       | 804/254-2955.  |
|                   |   | Web site:              | <a href="http://www.phippsbird.com">www.phippsbird.com</a> . |

Please see the back cover of this manual for the complete text of the LIMITED WARRANTY. It is important that you complete and return the Warranty Card provided. This is the only way to validate your LIMITED WARRANTY coverage. The Warranty Card is self-addressed and requires no postage when mailed in the United States.



### **NOTICE:**

**WHEN AND WHEREVER THIS SYMBOL IS ATTACHED TO THE OUTSIDE OF THE EQUIPMENT, REFER TO THE INSTRUCTION MANUAL. PLEASE READ ALL APPLICABLE CAUTIONS, WARNINGS AND INSTRUCTIONS. IT IS THE RESPONSIBILITY OF THE OPERATOR TO REFER TO THE INSTRUCTION MANUAL TO PRESERVE THE PROTECTION AFFORDED BY THE EQUIPMENT.**

## **PB-900™ Programmable JarTester - Specifications**

This equipment is designed to be operated under the following conditions:

- Indoor use
- Altitude up to 2000 m
- 5 °C to 40 °C (41 °F to 104 °F)
- Relative humidity 50% - 80%
- Supply voltage should not exceed +/- 10% of the nominal voltage
- Transient over voltage category II

If the equipment is used in a manner inconsistent with the above environmental conditions, the protection provided by the equipment and the functional capabilities of the equipment may be impaired.

### Electrical Requirements:

Model 7790-901: 120 volt AC, 60 Hz, 1 ampere  
Model 7790-902: 220-240 volt AC, 50/60 Hz, .75 amperes

Fluorescent Lamp: F25T8/TL741/RS

### Fuse:

Model 7790-901: 1 ampere, type 3AG, time-delay  
Model 7790-902: 1 ampere, type 5x20mm, time-delay

Dimensions: 9-1/4"(W) x 42-1/4"(L) x 15-1/2"(H)  
23.5(W) cm. x 107.3 cm. (L) x 39.4 cm. (H)

Weight: 49 lb.  
22.2 kg.

Stirrer Shafts and Paddles: Type 304 Stainless Steel

Stirring Speed: 0, 5-300 revs. /min.

Programmed Stirring Time: minimum - 0 seconds  
maximum - 59 minutes, 59 seconds

Alarm Frequency: minimum - 0  
maximum - 59 minutes



### **CAUTION:**

**IF THE EQUIPMENT IS USED IN A MANNER INCONSISTENT WITH THAT EXPRESSED BY PHIPPS & BIRD IN THIS INSTRUCTION MANUAL, THE PROTECTION PROVIDED BY THE EQUIPMENT AND THE FUNCTIONAL CAPABILITIES OF THE EQUIPMENT MAY BE IMPAIRED.**

## UNPACKING INSTRUCTIONS

The PB-900™ JarTester is partially disassembled for ease in shipping and to avoid damage in shipment. Upon receipt, carefully unpack the unit and verify that the following are included in the package:

- 1 ea. PB-900™ Programmable JarTester Unit (Main assembly)
- 1 ea. Power Cord
- 6 ea. Paddles
- 6 ea. Paddle Shafts w/ knobs, adjustment collars & thumbscrews.
- 1 ea. Fluorescent Light Tube
- 1 ea. Flat Blade Screwdriver with 5/64" Hex
- 1 ea. Dust Cover
- 1 set Velocity Gradient Curves (2-liter square B-Ker and 2-liter round lab beaker)

If all items are not found please contact Phipps & Bird as soon as possible.



Save all packing material and the shipping carton in the event your PB-900™ needs to be returned for repair or service.

### **What To Do If Shipping Damage (Concealed Damage) Is Discovered.**

The shipping carton and packaging have been specially designed to protect the equipment against damage during shipment and short-term storage.

If, upon opening the shipping carton and removing the equipment, the equipment is found to be damaged, the CARRIER must be notified immediately. The carrier will advise you what to do. The carrier may request that the damaged equipment be set aside for their inspection. If the carrier chooses to waive the inspection, a NOTICE OF WAIVER should be requested by you for your records.

If the carrier honors the damage claim, the equipment becomes its property. **UNDER NO CIRCUMSTANCES SHOULD YOU DISPOSE OF DAMAGED GOODS WITHOUT WRITTEN CONSENT OF THE CARRIER.**



**CAUTION:**

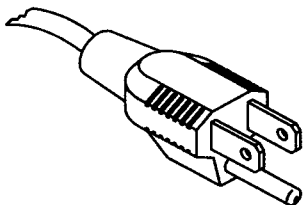
**DO NOT CONNECT THE EQUIPMENT TO A SOURCE OF ELECTRICAL POWER AND DO NOT ATTEMPT TO OPERATE THE EQUIPMENT UNTIL THE OPERATING INSTRUCTIONS HAVE BEEN READ AND UNDERSTOOD. SEE THE ELECTRICAL REQUIREMENTS SECTION FOR INFORMATION REGARDING THE PROPER SOURCE OF ELECTRICAL POWER. PLEASE CONTACT PHIPPS & BIRD IF YOU HAVE ANY QUESTIONS.**

**YOUR INSTRUMENT *MUST* BE ELECTRICALLY GROUNDED.**

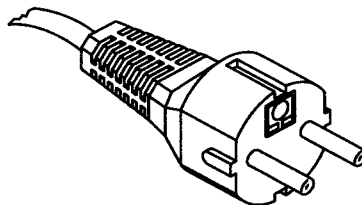
**DO NOT, UNDER ANY CIRCUMSTANCES, REMOVE THE GROUND PRONG OF THE POWER PLUG. DO NOT OPERATE THE EQUIPMENT IF THE GROUND PRONG IS MISSING.**

## **ELECTRICAL REQUIREMENTS**

This equipment is designed to operate on nominal 120 volt, 60 Hz (cycle) or 220-240 Volt, 50/60 Hz AC current. Unless requested otherwise by the customer, PHIPPS & BIRD normally supplies 120 Volt, 60 Hz apparatus. The customer should examine the plug on the power supply cord. The plug types shown below are the two types used on the equipment. The number and orientation of the prongs will indicate the electrical requirements of the instrument. In addition, the electrical requirements of each unit are indicated on the serial number label on the back of the JarTester adjacent to the power (mains) receptacle.



**120 Volt, 60 Hz AC**



**220-240 Volt, 50/60 Hz**

For either 120 or 220-240 volts, a fused electrical supply should be used (time delay fuse or circuit breaker recommended). Although not required, it is also recommended that a separate circuit, serving only this instrument, be provided, and that an extension cord not be used. If an extension is used, it should be a three-wire type (to provide a grounding circuit).

### **RECOMMENDED GROUNDING METHOD**

The 120 volt power supply cord is provided with a three-pronged grounding plug, which should be plugged into a mating grounding type receptacle in accordance with National Electrical Code and applicable local codes and ordinances. When a proper receptacle (grounding type) is not available, the existing receptacle should be changed to the proper receptacle and grounded in accordance with applicable codes.

The 220-240 volt power supply cord is provided with a CEE 7/7 standard two-prong plug, which should be plugged into a mating receptacle (grounding type). Installation of the receptacle must be in accordance with the ordinances of the safety agencies of the local community, province, state or country. When a proper receptacle (grounding type) is not available, the existing receptacle should be changed to the proper receptacle and grounded to earth. Phipps & Bird suggests that the operator DOES NOT attempt to use a grounding adapter for use with a 220-240 volt unit.

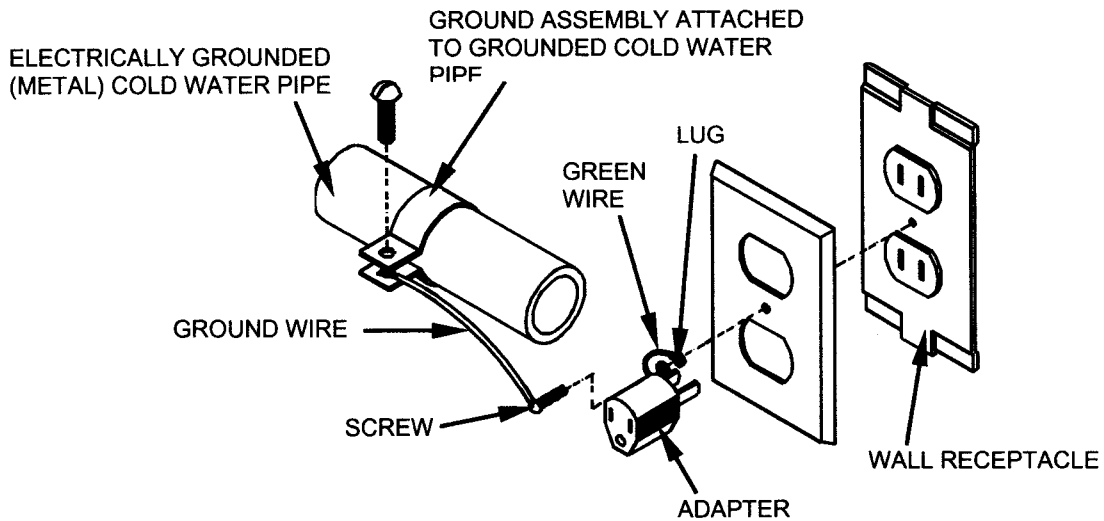
## ALTERNATE GROUNDING METHOD (120 Volt AC)

If changing and properly grounding the receptacle is impossible and where local codes permit, (consult your electrical inspector), a grounded adapter may be plugged into the existing three-pronged electrical power supply receptacle.

To ground the adapter, the plug of the green wire on the adapter must be connected to the receptacle cover plate screw. From this same screw a separate ground wire must be connected to a grounded cold water pipe which has metal continuity to electrical ground, uninterrupted by plastic, rubber or other electrically insulating connectors (see figure below).



**CAUTION: DO NOT GROUND TO A GAS SUPPLY PIPE.**

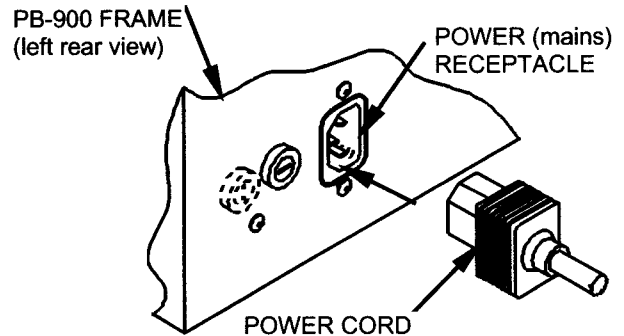


## ASSEMBLY INSTRUCTIONS

Select a reasonably level, stable surface for locating the PB-900™ JarTester. The JarTester should be located with access to electrical power as described in **ELECTRICAL REQUIREMENTS**. When placing the JarTester allow a minimum of 2" (5 cm) between the back of the JarTester and any wall or structure. Do not block the ventilation holes on the back or bottom of the JarTester.

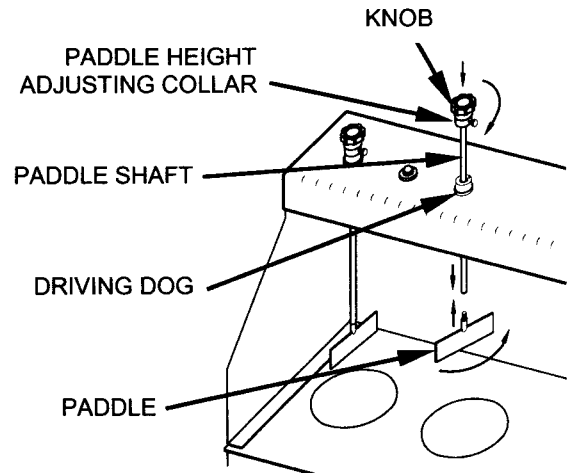
### POWER CORD ASSEMBLY

Unpack the power cord and insert the chassis end of the cord into the POWER (Mains) RECEPTACLE on the stirrer frame (see adjacent figure). Insert the plug completely into the receptacle to make full electrical contact.



### PADDLE ASSEMBLY

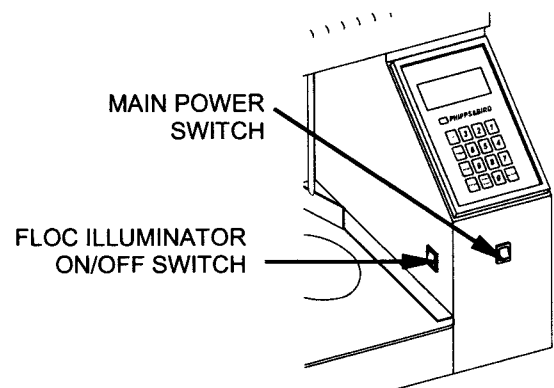
Unpack the six (6) PADDLE SHAFTS and six (6) PADDLES. Ensure that the PADDLE SHAFT is assembled to the PADDLE HEIGHT ADJUSTING COLLAR. Insert a PADDLE SHAFT into a DRIVING DOG on the JarTester. Hold the PADDLE SHAFT by the KNOB and screw the PADDLE onto the bottom of the PADDLE SHAFT. Tighten the PADDLE until snug, but do not tighten to the point that it will be difficult to remove. Repeat for all six (6) paddles (see adjacent figure).



## FLOC ILLUMINATOR

The PB-900 JarTester is equipped with a Floc Illuminator light base. The light base can be used to illuminate beaker samples during stirrer agitation or during a period of rest. Illumination is from below the beakers. The illuminator is powered ON or OFF with a switch located on the inside panel of the electronic control box.

The light base uses a fluorescent lamp and is easily replaced when needed. Please see the MAINTENANCE section of the manual.

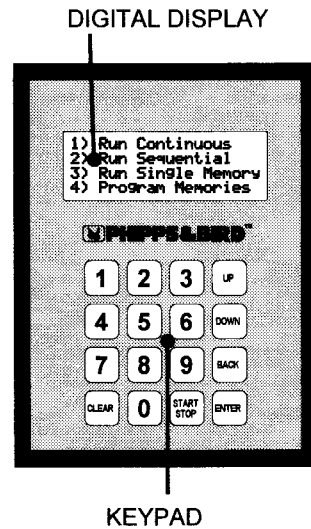


# CONTROL PANEL

## DIGITAL DISPLAY

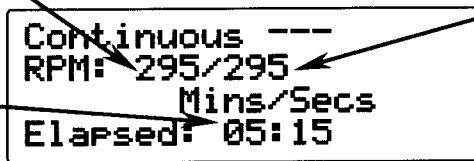
The digital display window is a twenty character x four-line dot matrix LCD module. The module has a green LED backlit panel. All control menus, prompts for user input, program parameter and stirrer status windows are indicated here. Explanations of all displays are included in the OPERATING INSTRUCTIONS and EXAMPLE PROGRAM sections of the manual.

The main menu window is shown to the right. This is the first display window shown after the controller has initiated. Other windows display additional information. See Below.



Running RPM Speed  
Displays the actual speed of stirrer agitation in RPM.

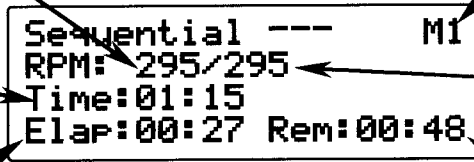
Elapsed Time  
Displays the units and running time in either MINS/SECS or HRS/MINS.



RPM Input Field. Displays the programmed or "set" rpm speed.

Running RPM Speed  
Displays the actual speed of stirrer agitation in RPM.

Programmed Run Time  
Displays the programmed run time in MINS/SECS.



MEMORY INDICATOR  
Displays the Memory (1-4) currently selected and/or operating.

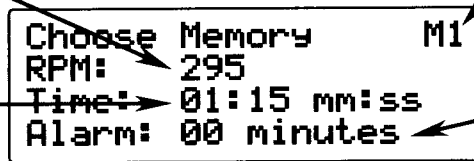
Programmed RPM Speed  
Displays the programmed or "set" rpm speed.

Run Elapsed Time  
Displays the elapsed run time in MINS/SECS during a particular memory operation.

Run Remain Time  
Displays the remaining run time in MINS/SECS during a particular memory operation.

Programmed RPM Speed  
Displays the programmed or "set" rpm speed.

Programmed Run Time  
Displays the programmed run time in MINS/SECS.



MEMORY INDICATOR  
Displays the Memory (1-4) currently selected and/or operating

Programmed Alarm Interval  
Displays the programmed alarm interval in minutes.



## KEYPAD

User inputs are made with the 16-button keypad. The buttons include a numeric keypad (0-9, blue keys) and six control buttons (green keys). The control buttons are as follows:



*NUMERIC KEYS* are used for all numeric input (0-9).



*CLEAR* is used:

- To reset to zero the *ELAPSED TIME* at any time during a *CONTINUOUS* stirring operation and
- When any desired program parameter (*RPM, TIME, ALARM*) was incorrectly entered and the *ENTER* button was not pressed. The input selection may be zeroed by pressing the *CLEAR* button and then the correct parameter may be entered.



*START/STOP* is used to begin and/or terminate all stirring operations.

- It must be used to begin and terminate a *CONTINUOUS* stirring operation.
- It also must be used to begin a *RUN SEQUENTIAL* and *RUN SINGLE MEMORY* operation. Under normal circumstance, the *START/STOP* button is not used to stop a *RUN SEQUENTIAL* OR *RUN SINGLE MEMORY* operation, only to terminate those operations before they complete their programmed operation.



*ENTER* is used to accept all numeric entries. It is also used to accept a chosen memory while programming and to choose a *RUN SINGLE MEMORY*.



*BACK* is used to cycle through various display windows, ultimately to the *MAIN* selection window.



*DOWN* is used to cycle through memories in a descending order, for example 1-4-3-2.



*UP* is used to cycle through memories in an ascending order, for example 1-2-3-4.

## OPERATING INSTRUCTIONS

The PB-900™ JarTester is a multi-functional stirring apparatus capable of operating in a non-programmed (CONTINUOUS) or programmed (RUN SINGLE MEMORY 1-4, SEQUENTIAL) mode.

### Run Continuous

In the Continuous mode, the stirring speed (0 or 5-300 rpm.) is set, then the stirring is "started" and the stirrer operates until the stirring is "stopped". Stirrer speed can be adjusted up or down while the stirrer is running. To operate the JarTester in continuous mode follow these steps:

1. Turn the power switch "on". After the programmable controller initiates, the MAIN selection window will appear. If desired, turn the Floc Illuminator switch ON. Note: the Floc Illuminator may be turned on or off at any time.

1) Run Continuous  
2) Run Sequential  
3) Run Single Memory  
4) Program Memories
2. Select *Run Continuous* by pressing "1" on the keypad. The Continuous mode window will appear. A blinking cursor appears beside the RPM Input Field.
3. Enter desired operating speed of zero or between 5 and 300 rpm. If the desired speed was incorrectly entered, the input selection may be zeroed by pressing the CLEAR button and then a new speed may be entered. The input selection will blink for fifteen seconds or until the ENTER button is pressed. (Note: After fifteen seconds, if the ENTER button is not pressed, the input selection will time out and change to "000".)

Continuous ---  
RPM: 000/000  
      Mins/Secs  
Elapsed: 00:00
4. Press ENTER to accept the desired RPM speed.
5. Press the START/STOP button to begin stirring.
6. Press the START/STOP button to stop stirring.
7. At the end of a CONTINUOUS mode operation you have two options:
  - begin a new CONTINUOUS mode operation (see steps 3-6 above) or
  - Press BACK to go to the MAIN selection window. You may now reselect an operating mode (RUN CONTINUOUS, RUN SEQUENTIAL, RUN SINGLE MEMORY or PROGRAM MEMORIES) or turn the JarTester off with the power switch.

The ELAPSED TIME will begin to count when the START/STOP button is pressed. The ELAPSED TIME may be reset to zero by pressing CLEAR at any time during a CONTINUOUS stirring operation. ELAPSED TIME will also re-zero when the START/STOP button is pressed.

The RPM speed may be changed at any time, even while the unit is stirring. Enter the new desired speed by pressing the appropriate numeric characters. The new speed entry will blink until the ENTER button is pressed. When the ENTER button is pressed, the stirrer will adjust to the new speed. (Note: After fifteen seconds, if the ENTER button is not pressed, the input selection will time out and change to the previous setting.)

## Program Memories (1,2,3 & 4)

The program memory for the Phipps & Bird PB-900 JarTester is non-volatile. The program will stay in memory if the power switch is turned off or the power cord is disconnected from a power source.

Each memory can be programmed with a "set" speed (0 or 5-300 rpm), timed duration of stirring (1 second to 59 minutes, 59 seconds), and optional timed signal alarm (frequency in minutes, 0-59 minutes). Each memory can operate alone or sequentially (see below). To program and operate individual memories follow these steps:

1. Turn the power switch "on". After the programmable controller initiates, the MAIN selection window will appear. If desired, turn the Floc Illuminator switch ON. Note: the Floc Illuminator may be turned on or off at any time.

```
1) Run Continuous
2) Run Sequential
3) Run Single Memory
4) Program Memories
```

2. Select *Program Memories* by pressing "4" on the keypad. The CHOOSE MEMORY screen will appear.

3. Select a memory to program by scrolling through the memories, 1-4, with the UP and DOWN buttons. Previously programmed memory parameters will be displayed with each memory. At the initial setup, all parameters will be zero.

```
Choose Memory      M1
RPM:      000
Time:    00:00 mm:ss
Alarm:   00 minutes
```

4. Press ENTER at the chosen memory (1-4). The "EDITING VALUES" screen will appear.

5. A blinking cursor will appear beside the programmed RPM speed. Enter the desired RPM speed between 5 and 300 (a RPM speed of zero may also be entered). Press ENTER to accept the RPM speed. The blinking cursor will cycle to the next field (TIME).

```
Editing Values in M1
RPM:      000
Time:    00:00 mm:ss
Alarm:   00 minutes
```

6. Enter the desired run TIME between 0 seconds and 59 minutes, 59 seconds. Press ENTER to accept the run TIME. The blinking cursor will cycle to the next field (ALARM).

7. Enter the desired frequency for the signal ALARM. This is an optional parameter and may be left at zero. The frequency for the ALARM must be a value, in minutes, no greater than the programmed run TIME. Press ENTER to accept the ALARM parameter. The blinking cursor will cycle back to the RPM speed field.

8. All necessary parameters for a particular memory (1-4) have now been entered. Any parameter may be changed for this particular memory by repeating the appropriate steps (4-7) above.

9. Press BACK to go to the MAIN selection window. You may now reselect an operating mode (RUN CONTINUOUS, RUN SEQUENTIAL, RUN SINGLE MEMORY or PROGRAM MEMORIES) or turn the JarTester off with the power switch.

If any desired program parameter (RPM, TIME, ALARM) was incorrectly entered and the ENTER button was not pressed, the input selection may be zeroed by pressing the CLEAR button and the correct speed may be entered. The input selection will blink for fifteen seconds or until the ENTER button is pressed. After fifteen seconds, if the ENTER button is not pressed, the input selection will "time out" and change to the previous programmed value.

## Run Sequential

The Run Sequential mode is the most beneficial mode when performing a jar test or any stirring procedure that requires changes in the stirring speed at timed intervals. The Run Sequential mode, when started, executes the programmed memories (1-4) in numerical order.

1. Turn the power switch "on". After the programmable controller initiates, the MAIN selection window will appear. If desired, turn the Floc Illuminator switch ON. Note: the Floc Illuminator may be turned on or off at any time.

```
1) Run Continuous
2) Run Sequential
3) Run Single Memory
4) Program Memories
```

2. Program memories (1,2,3 and/or 4) with RPM speed, TIME and ALARM frequency settings into the controller memory. See above. If memory parameters have previously been entered and are acceptable, no additional programming is required.

3. Select *Run Sequential* by pressing "2" on the keypad. The SEQUENTIAL mode screen will appear.

```
Sequential --- M1
RPM: 000/295
Time:01:15
Elap:00:00 Rem:01:15
```

4. Press the START/STOP button to begin stirring.

5. At the end of a RUN SEQUENTIAL mode operation you have two options:

- Begin a new RUN SEQUENTIAL mode operation (see steps 2-3 above) or
- Press BACK to go to the MAIN selection window. You may now reselect an operating mode (RUN CONTINUOUS, RUN SEQUENTIAL, RUN SINGLE MEMORY or PROGRAM MEMORIES) or turn the JarTester off with the power switch.

A SEQUENTIAL operation may be interrupted at any time by pressing the START/STOP button. To restart a SEQUENTIAL operation press the START/STOP button again and the SEQUENTIAL mode will begin with MEMORY 1. Note: The SEQUENTIAL operation will not resume where it was interrupted, but restart at MEMORY 1.

## Run Single Memory

Any individual MEMORY (1-4) may be operated alone. To run follow these steps:

1. Turn the power switch "on". After the programmable controller initiates, the MAIN selection window will appear. If desired, turn the Floc Illuminator switch ON. Note: the Floc Illuminator may be turned on or off at any time.

```
1) Run Continuous
2) Run Sequential
3) Run Single Memory
4) Program Memories
```

2. Program memories as described in the previous section.

3. Select *Run Single Memory* by pressing "3" on the keypad. The CHOOSE MEMORY screen will appear.

```
Choose Memory M1
RPM: 000
Time: 00:00 mm:ss
Alarm: 00 minutes
```

4. Select a memory to operate by scrolling through the memories, 1-4, with the UP and DOWN buttons. Previously programmed memory parameters will be displayed with each memory.

5. Press ENTER at the chosen memory (1-4). The SINGLE MEMORY screen will appear.

```
Single Memory    M1
RPM: 000/295
Time:01:15
Elap:00:00 Rem:01:15
```

6. Press the START/STOP button to begin stirring.

7. At the end of a RUN SEQUENTIAL mode operation you have two options:

- Press the START/STOP button to restart the same SINGLE MEMORY or
- Press BACK to go to the MAIN selection window. You may now reselect an operating mode (RUN CONTINUOUS, RUN SEQUENTIAL, RUN SINGLE MEMORY or PROGRAM MEMORIES) or turn the JarTester off with the power switch.

### Example Program

This section is intended to give a systematic instruction on programming a typical jar test procedure. Your jar test procedure may be different. However, if the operator follows this example he or she should be well acquainted with the programming features so that they can substitute their parameters (RPM speed, run TIME, ALARM frequency) and perform their own unique jar test. This example procedure is merely given as a means of showing how quickly and easily the operator can program their unique procedure.

Example procedure:

Flash Mix: 295 r.p.m. for 1 minute and 15 seconds.  
Floc Mix: 25 r.p.m. for 5 minutes.  
Settling period: 0 r.p.m. (no agitation) for 10 minutes. Samples will be taken for examination every 2 minutes

The flash mix will be programmed as Memory 1, the Floc Mix will be programmed as Memory 2 and the Settling period will be programmed as Memory 3. For this example, Memory 4 will not be programmed, as it is not needed and will be cleared to ensure it will not operate. To program the above procedure, follow these steps:

1. Turn the power switch "on". After the programmable controller initiates, the MAIN selection window will appear. If desired, turn the Floc Illuminator switch ON. Note: the Floc Illuminator may be turned on or off at any time.

```
1) Run Continuous
2) Run Sequential
3) Run Single Memory
4) Program Memories
```

2. Select *Program Memories* by pressing "4" on the keypad. The CHOOSE MEMORY screen will appear.

```
Choose Memory    M1
RPM: 000
Time: 00:00 mm:ss
Alarm: 00 minutes
```

3. Press ENTER and the "EDITING VALUES in M1" screen will appear.

```
Editing Values in M1
RPM: 295
Time: 00:00 mm:ss
Alarm: 00 minutes
```

4. A blinking cursor will appear beside the programmed RPM speed. Press "295" and ENTER to accept the RPM speed. The blinking cursor will cycle to the next field (TIME).

5. Press "115" and ENTER to accept the run TIME. The blinking cursor will cycle to the next field (ALARM).

```
Editing Values in M1
RPM: 295
Time: 01:15 mm:ss
Alarm: 00 minutes
```

6. If there is a value other than zero in the ALARM frequency field press "0" and ENTER. Otherwise, press BACK to go to the CHOOSE MEMORY screen.
7. Press UP and ENTER. The "EDITING VALUES in M2" screen will appear.
 

Editing Values in M2  
 RPM: 025  
 Time: 00:00 mm:ss  
 Alarm: 00 minutes
8. Press "25" and ENTER to accept the RPM speed.
9. Press "500" and ENTER to accept the run TIME.
 

Editing Values in M2  
 RPM: 025  
 Time: 05:00 mm:ss  
 Alarm: 00 minutes
10. If there is a value other than zero in the ALARM frequency field press "0" and ENTER. Otherwise, press BACK to go to the CHOOSE MEMORY screen.
11. Press UP twice and ENTER. The "EDITING VALUES in M3" screen will appear.
 

Editing Values in M3  
 RPM: 000  
 Time: 00:00 mm:ss  
 Alarm: 00 minutes
12. Press "0" and ENTER to accept the RPM speed.
13. Press "1000" and ENTER to accept the run TIME.
 

Editing Values in M3  
 RPM: 000  
 Time: 10:00 mm:ss  
 Alarm: 00 minutes
14. Press "2" and ENTER to accept the ALARM frequency.
15. Press BACK to go to the CHOOSE MEMORY screen.
 

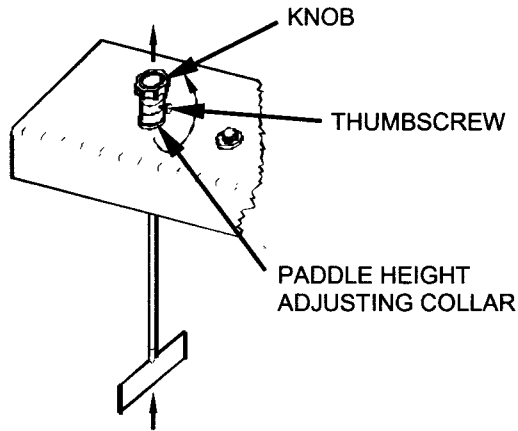
Editing Values in M3  
 RPM: 000  
 Time: 10:00 mm:ss  
 Alarm: 02 minutes
16. Press DOWN to go to the "EDITING VALUES in M4". Review all parameters and verify all values are zeroed. If not, change all values to zero as previously discussed.
17. Press BACK twice to go to the MAIN selection window.
18. Press "2" to select "*Run Sequential*".
19. Press the START/STOP button and the PB-900™ JarTester will perform the example procedure outline above.
20. After completion of the programmed procedure, you may either repeat the procedure by pressing START/STOP or press BACK to go to the MAIN selection window. You may then reselect an operating mode (RUN CONTINUOUS, RUN SEQUENTIAL, RUN SINGLE MEMORY or PROGRAM MEMORIES) or turn the JarTester off with the power switch.

A programmed procedure may be interrupted at any time by pressing the START/STOP button. If so the procedure could only be restarted from the beginning (Memory 1) or BACK to the MAIN selection window.

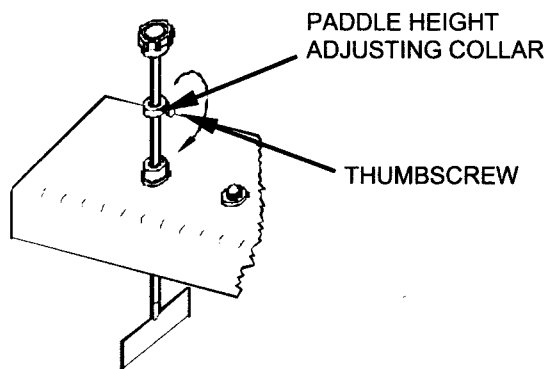
The individual memories (1,2,3, & 4) are now stored in the controller until they are changed or are cleared as described in Program Memories. (Note: Turning the JarTester off or unplugging the JarTester from a power source does not erase the programming. Only by changing or clearing a memory will any parameter be altered). In addition, each individual memory may be operated alone. For example, if the operator wished to perform only the Flash Mix (Memory1) as described above, all that would be required is to follow the Run Single Memory as described previously.

## ADJUSTING PADDLE HEIGHT

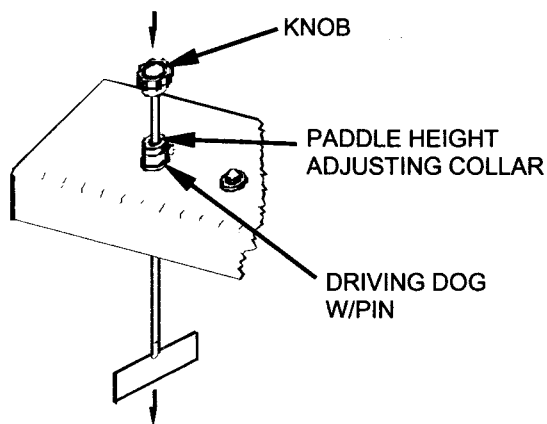
The paddles on the PB-900™ can be raised and lowered by means of the PADDLE HEIGHT ADJUSTING COLLARS. To raise or lower the paddles:



1. Grab KNOB and raise paddle.
2. Turn THUMBSCREW counterclockwise and loosen PADDLE HEIGHT ADJUSTING COLLAR from paddle shaft.



3. Set PADDLE HEIGHT ADJUSTING COLLAR at desired height and tighten THUMBSCREW to paddle shaft.



4. Lower KNOB until PADDLE HEIGHT ADJUSTING COLLAR engages with PIN on DRIVING DOG.

## MAINTENANCE

The PHIPPS & BIRD PB-900™ Programmable JarTester is designed and constructed to provide long-term service with a minimum of maintenance. The operator should only need to perform the following:

### LUBRICATE BEARINGS

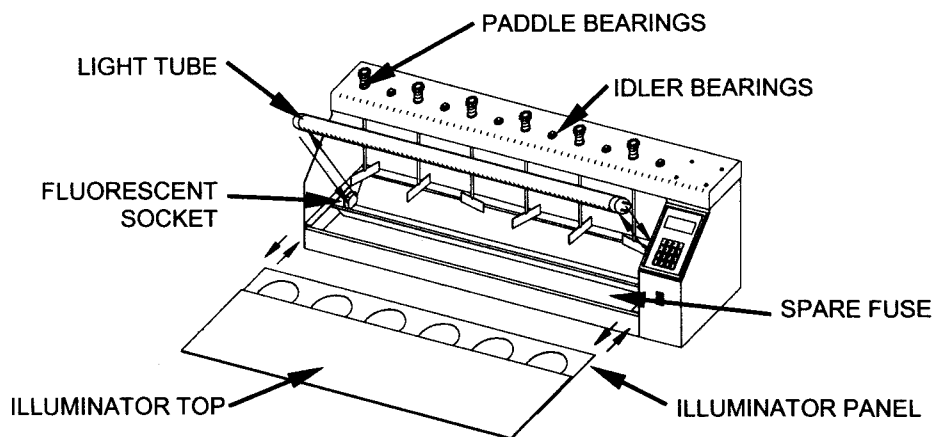
Lubricate the Paddle Bearings and the Idler Bearings at least once a year. A good quality multi-purpose, lightweight (SAE 10 or 15) oil is satisfactory. A small drop is sufficient. No disassembly is required to perform this simple maintenance. See lubrication points in figure below.



**CAUTION:**  
**DISCONNECT THE JARTESTER FROM ITS POWER SOURCE BEFORE REPLACING THE LIGHT TUBE. THE FLUORESCENT LIGHT TUBE CONTAINS GASES: USE CAUTION TO PREVENT BREAKAGE**

### REPLACE ILLUMINATOR LIGHT TUBE (see figure below)

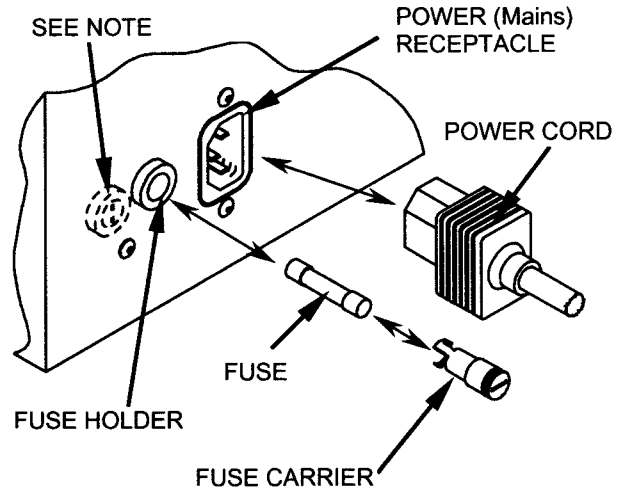
After extended use the fluorescent LIGHT TUBE may burn out and require replacement. To replace the LIGHT TUBE remove the ILLUMINATOR TOP hold down screws. The screws are located at the front edge of the ILLUMINATOR TOP. Using both hands, slide the ILLUMINATOR TOP and the ILLUMINATOR PANEL from the JarTester frame. Grasp the LIGHT TUBE and turn approximately one-quarter turn so that the pins on the end of the LIGHT TUBE align with the slots on the FLUORESCENT SOCKET. Lift the old LIGHT TUBE from the FLUORESCENT SOCKETS and discard tube. Install the new tube by sliding the endpins of LIGHT TUBE into slots on the FLUORESCENT SOCKETS. Turn the tube approximately one-quarter turn until the tube fits snugly in the fixture. Slide the ILLUMINATOR TOP and the ILLUMINATOR PANEL back into the JarTester frame and then replace the ILLUMINATOR TOP hold-down screws.





## REPLACE FUSE

The FUSE(s) on your PB-900™ Programmable JarTester may on occasion require replacement. The JarTester will not function if the FUSE is blown or defective. To check to see if a FUSE is defective, first unplug the POWER CORD from the MAINS RECEPTACLE. Locate the FUSE HOLDER(s) on the back of the JarTester unit (see adjacent figure). Use the small flat blade SCREWDRIVER included with your JarTester and insert the blade into the slot on the FUSE CARRIER. Push the FUSE CARRIER in and make a 1/4 counter-clockwise turn until the carrier releases from the FUSE HOLDER and springs out. The FUSE CARRIER and FUSE can now be removed. Remove the FUSE from the carrier and check to see if the FUSE has a "break" or appears "blown". If the fuse appears defective, replace it with a 1-amp type 3AG Time-Delay Fuse.



Note: 220-240 volt JarTester require two (2)  
1 amp, type 5x20mm Time Lag fuses.

To replace the new or old fuse(s), insert the FUSE in the FUSE CARRIER. A spare fuse is supplied with all new PB-900 JarTesters and is stored inside the FLOC ILLUMINATOR. Open the FLOC ILLUMINATOR (see the previous section, REPLACE ILLUMINATOR LIGHT TUBE for instructions). Locate the spare FUSE and remove it from its holder. Replace the FLOC ILLUMINATOR TOP and PANEL. Insert the FUSE and CARRIER into the FUSE HOLDER. Insert the flat blade screwdriver into the slot on the FUSE CARRIER and gently push while turning clockwise until the FUSE CARRIER recedes into the FUSE HOLDER and locks in place. Reinsert the POWER CORD into the POWER RECEPTACLE. The JarTester is now ready for use.



**DO NOT ATTEMPT TO SERVICE THE ELECTRONIC COMPONENTS. ANY REQUIRED MAINTENANCE TO THE PROGRAMMABLE CONTROLLER AND ITS ELECTRONICS MUST BE PERFORMED BY A PHIPPS & BIRD TECHNICIAN.**

## CLEANING

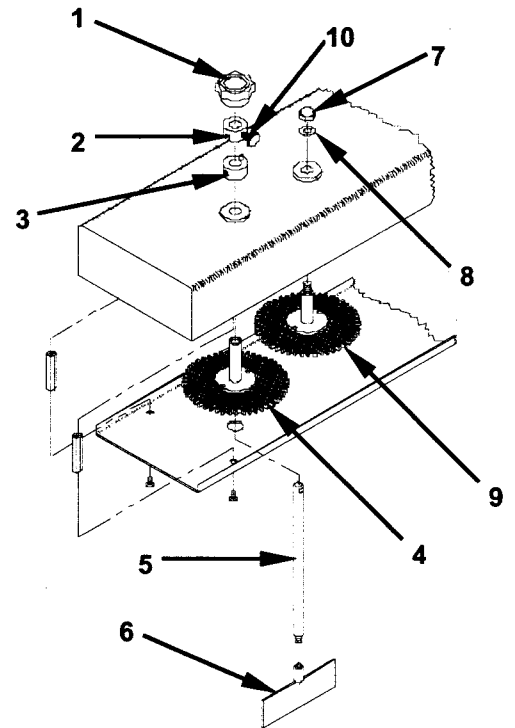
Use a mild household detergent when cleaning the PB-900™ JarTester. Disconnect the JarTester from its power source. Dampen a cloth with the cleaner and wipe the soiled area of the JarTester. Allow the unit to dry before reconnecting to its power source.



**CAUTION:**  
**DO NOT ATTEMPT TO IMMERSE THE JARTESTER IN WATER OR LIQUID WHEN CLEANING OR OTHERWISE. DO NOT POUR LIQUIDS INTO OR ONTO THE JARTESTER. IF WATER OR ANY LIQUIDS ARE SPILLED ONTO OR INTO THE JARTESTER, UNPLUG THE UNIT FROM ITS POWER SOURCE IMMEDIATELY. WIPE ALL ACCESSIBLE LIQUIDS WITH A DRY CLOTH AND THEN ALLOW FOR ALL LIQUIDS TO DRY BEFORE PLUGGING THE UNIT TO ITS POWER SOURCE**

## REPLACEMENT PARTS LIST

| ITEM NO.   | DESCRIPTION  | PART NUMBER |
|--|--|-------------|
| <b>Paddle and Gear Train:</b>  |  |             |
| 1  | Paddle Knob  | 351000010   |
| 2  | Paddle Height Adjusting Collar                               | 100472500   |
| 3  | Driving Dog  | 977904014   |
| 4  | Paddle Gear and Shaft  | 977904012   |
| 5  | Paddle Shaft   | 100023302   |
| 6  | Paddle Blade with Stem                                       | 977909008   |
| 7  | Acorn Nut, 1/4-28  | 383025028   |
| 8  | Washer   | 803025020   |
| 9  | Idler Gear and Shaft   | 977904013   |
| 10   | Thumbscrew   | 450000041   |
| <b>Items 5 and 6 may be purchased together</b>                             |  |             |
|  | Paddle shaft w/ removable blade                              | 977909009   |
| <b>Misc.:</b>  |  |             |
|  | Acrylic Illuminator Top                                      | 977909012   |
|  | Fluorescent Light Tube, 120 & 220 volt units, F25T8/TL741/RS | 430000036   |
| <b>Note: ITEM NO. refers to the numbered items in the adjacent figure.</b> |  |             |



## **LIMITED WARRANTY**

Phipps & Bird, Inc. (" the Company") warrants that this equipment will be free from defects in material and workmanship under normal use and service for a period of one (1) year from the date of shipment. This warranty extends solely to the original purchaser of the equipment who uses same and may not be assigned or otherwise transferred to any other person. The Company's liability under this warranty is limited solely to replacing or repairing, at the discretion of the Company, the equipment that is defective; provided, however, that the Company shall not be liable under this warranty unless (a) the Company is notified promptly in writing, at the address printed on the warranty card, by the owner, upon the discovery of a defect, (b) if requested by the Company, defective equipment is promptly returned to the Company, and (c) the Company determines that the malfunction of the equipment was not caused by misuse, neglect, improper installation, repair, alteration or accident. **IN NO EVENT SHALL THE COMPANY BE LIABLE TO THE OWNER OF THE EQUIPMENT FOR LOSS OF PROFITS, LOSS OF USE, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR DAMAGES OF ANY KIND BASED UPON A CLAIM FOR BREACH OF WARRANTY, OTHER THAN THE PURCHASE PRICE OF ANY DEFECTIVE EQUIPMENT COVERED HEREUNDER.** This warranty shall not be enlarged, diminished or affected by, and no obligation or liability shall arise out of, the rendering of technical advice or service by the Company in connection with the equipment. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you. **THE FOREGOING IS IN LIEU OF ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY AND ANY WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE.** Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

