**“Big & Bigger Bill”**

Analog, Digital and Patented Digital Oscillating Orbital Shakers

**OPERATION MANUAL AND PARTS LIST**

<table>
<thead>
<tr>
<th>Volts</th>
<th>Analog Model</th>
<th>Series</th>
<th>Digital Model</th>
<th>Series</th>
<th>Digital Oscillating Model</th>
<th>Series</th>
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<tr>
<td>100</td>
<td>M49124*</td>
<td>720</td>
<td>M73424*</td>
<td>734</td>
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<td>M73620*</td>
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<td>M73530*</td>
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<td>M73730*</td>
<td>737</td>
</tr>
</tbody>
</table>

*CSA Approved*
IMPORTANT INFORMATION

This manual contains important operating and safety information. The user must carefully read and understand the contents of this manual prior to the use of this equipment.

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Safety Information

Your Thermolyne "Big Bill" Orbital Shaker has been designed with function, reliability, and safety in mind. It is the user's responsibility to install it in conformance with local electrical codes. For safe operation, please pay attention to the alert boxes throughout the manual.

Alert Boxes

<table>
<thead>
<tr>
<th>![WARNING]</th>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warning alerts apply when there is a possibility of personal injury.</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>![CAUTION]</th>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caution alerts apply when there is a possibility of damage to the equipment.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>![NOTE]</th>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notes alert the manual user to pertinent facts and conditions.</td>
<td></td>
</tr>
</tbody>
</table>
Warnings

**WARNING**

To avoid electrical shock, always:
1. Use a properly grounded electrical outlet of correct voltage and current handling capacity.
2. Disconnect from the power supply prior to maintenance and servicing.

To avoid personal injury and damage:
1. Do not use in the presence of flammable or combustible materials; fire or explosion may result. This device contains components which may ignite such materials.
2. Refer servicing to qualified personnel.
3. When agitating caustic materials, use great care as materials can be thrown some distance from the shaker.
## Specifications

### Dimensions

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Analog</th>
<th>Digital</th>
<th>Digital Oscillating</th>
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<tr>
<td></td>
<td>Big Bill Series 720 49100</td>
<td>Bigger Bill Series 721 49200</td>
<td>Big Bill Series 734 73400</td>
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<tr>
<td>OVERALL DIMENSIONS</td>
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<td></td>
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</tr>
<tr>
<td>Width</td>
<td>11.0</td>
<td>16.0</td>
<td>11.0</td>
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<tr>
<td>Height (In inches)</td>
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<td>7.0</td>
<td>7.0</td>
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<tr>
<td>Depth</td>
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<td>16.0</td>
<td>13.0</td>
</tr>
<tr>
<td>MIXING SURFACE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WEIGHT (IN LBS)</td>
<td></td>
<td></td>
<td></td>
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<td>Ship</td>
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### Electrical Ratings

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<tr>
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<th>Hertz</th>
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<tr>
<td>720</td>
<td>M49124</td>
<td>100</td>
<td>0.4</td>
<td>50/60</td>
</tr>
<tr>
<td>721</td>
<td>M49234</td>
<td>120</td>
<td>0.4</td>
<td>50/60</td>
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<td>734</td>
<td>M73424</td>
<td>220-240</td>
<td>0.2</td>
<td>50/60</td>
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<tr>
<td>735</td>
<td>M73534</td>
<td>240</td>
<td>0.2</td>
<td>50/60</td>
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<tr>
<td>736</td>
<td>M73624</td>
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<td>50/60</td>
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<tr>
<td>737</td>
<td>M73734</td>
<td>50/60</td>
<td>0.2</td>
<td>50/60</td>
</tr>
</tbody>
</table>

All Models

**Orbit Size, all units (in inches)** 0.75

**Stirring Speed, all units (RPM)** 25 to 450

**Operating Environment** All Models

**Maximum Temperature** 45°C

**Minimum Temperature** 4°C

**Maximum Load** 55 lbs

Unit does not include vessel clamps or side wings to clamp unit down (see pages 5 & 7).
Installation

Installing Platforms

The flask-holder platform, the Double-Tiered platform, or the universal platform is installed by using the following procedure:

First, place metal spacers over the four tapped holes located in the top cover. Place platform over top of metal spacers while aligning the holes in the platform with the holes in the top of the shaker base. Place the four flathead screws through the platform and tighten.

Platform Installation

CAUTION
Before plugging the shaker into a power outlet, be sure to check the voltage on the specification plate to see that it corresponds to the outlet voltage.

Be sure the power switch is OFF and the shaker speed control turned to 25 (minimum speed), before plugging the shaker into the outlet.

Analog Big Bill Operation

WARNING
Do not use in the presence of flammable or combustible materials; fire or explosion may result. This device contains components which may ignite such materials.

To avoid personal injury and damage, when agitating caustic materials, use great care as materials can be thrown some distance from the shaker.

CAUTION
To avoid damage to the shaker or adjacent objects, be sure there is at least one inch of clearance between the platform and adjacent objects before operating.

Make certain that the shaker is placed on a firm immovable surface. Do not operate on wheeled carts as the shaker may cause the cart to "walk."

The shaker is now ready for operation. Load the platform, placing the flasks or other containers as symmetrically about the center as possible. Turn the switch ON, and adjust the speed control for the desired agitation.

NOTE

The numbers on the speed control dial plate of the Analog Big Bill or Bigger Bill shaker are reference numbers and do not depict precise RPM, but are approximations of the actual RPM.

Optimum load (for minimal vibration) on the smaller shaker (Big Bill) is approximately 4-1/2 lbs. For the larger shaker (Bigger Bill), the optimum load is approximately 10 lbs. Maximum load is 55 lbs. for both the Big and Bigger Bill.

* (patent #5,375,927)
NOTE
The platforms for the larger shaker can also be used with the smaller shaker if held to the load limit of the smaller shaker (only three hold-down screws will fit).

Bill’s Side Wings
With minimum loading and at higher speeds, there may be a tendency for the shaker to “walk.” This is a result of the shaker being optimally counterbalanced for a larger load. Adding some weight to the top will prevent this tendency. As the unit approaches optimum loading conditions, vibration becomes very small. To further stabilize the shaker, Barnstead/Thermolyne does offer “wings” for Big Bill and its brother, Bigger Bill. These wings allow you to fasten Bill down to a counter top by means of bolts or by ‘C’-clamps. The Part Number for these wings is AY720X1 (see page 10).

Stacking of Platforms (Double Tier)
At slow speeds (100 rpm or lower), loads may be increased substantially. These lower speeds will allow you to stack two platforms on the same machine.

You may order the complete double – tiered platform assembly — which includes two platforms and the assembly hardware. See parts list (page 10).

CAUTION
The double-tiered platform for flask holders is silkscreened to identify positioning of the larger size flask holders. The bottom platform will accommodate 10 ml - 2000 ml flasks only.

Do not stack 1000 ml, 2000 ml, 4000 ml or 6000 ml flasks on the upper tier. The shaker will be unbalanced, resulting in possible damage to the shaker.

Use Thermolyne part no. FN491X2 posts at the corners of the platforms (note the small holes near the corners). Attach with 1/4-20 X 1/2” screws (FSX40) with (FWX27) washer under each head to resist vibration from loosening the screws.

CAUTION
Be sure to tighten the screws thoroughly and inspect the screws at frequent intervals for loosening.

Do not use higher speeds (over 100 rpm) with stacked platforms.
Digital Big and Bigger Bill Operation

To Set Speed and Time
1. Turn unit on.
2. Press up or down speed key.

NOTE
Unit will remember last speed setting even when turned off.

A decimal point in the lower right corner of the speed display will illuminate indicating set speed. After 5 seconds, display will indicate actual speed. The set speed is shown only during or after pressing the Speed Up or Speed Down keys.

Speed can be set from 25 to 450 RPM. The speed setting may go higher or lower than the specified range. However, we can not guaranty uniformity or conformity to specifications outside the range of 25-450 RPM.

3. For timed mixing, press the up or down timer key to set timer.

NOTE
Timer will not count down when shaker is not in motion.

Time is in HOURS: MINUTES to a maximum of 99 hours and 59 minutes.

4. Press start/stop button.
5. Unit will gradually ramp up to speed and run for the specified amount of time.
6. Two (2) beeps will sound when Bill is through mixing.

NOTE
You may elect to keep the unit running virtually forever by just pressing the start/stop button without setting a time. The word "ON" will appear in the time display when in the infinite time mode.

Pressing both the up and down timer keys simultaneously and holding them for 3 seconds will clear the timer and will stop the unit from mixing. The lighted green switch will remain lit in this case.
Digital Oscillator Big and Bigger Bill Operation

The patented Digital Oscillator Big and Bigger Bill® has all the features and attributes found on the digital models. (See page 7.) However, this model offers the following patented features not found on the digital or analog versions.

**Mode Button**
The mode button allows you to change mixing directions. Your choices are: 1) Clockwise , 2) Counterclockwise , and 3) Oscillating . Your current mode is depicted by illuminated arrows to the left of the speed control display. Each time the mode button is depressed, the unit will stop. You will need to press Start again to re-activate the mixing action.

By depressing the mode button to the dual arrow position, the oscillating function will be chosen. You will note that, unlike the other modes, the set speed indicator (decimal point) will remain illuminated in the oscillating mode. Since the RPM display is always in a state of flux while oscillating, confusion is avoided by continuously displaying set speed while unit is mixing.

**Timer Control**

**Mixing Timer**
The mixing time is set using the same method as outlined under Digital Operation on page 7.

**Oscillation Timer**
By pressing the Mode button **and** the Up or Down timer keys, the oscillating time can be set. Minimum time is 5 seconds, maximum is 9999 seconds. Once oscillating time is set, the unit will mix in one direction for that amount of time, stop briefly, then continue in the reverse direction for the same amount of time.

The total time the oscillation action takes place is set as before, i.e. using the Up and Down timer keys **without** holding in the mode button.

**NOTE**
You may elect to keep the unit running virtually forever by just pressing the start/stop button without setting a time. The word "ON" will appear in the time display when in the infinite time mode.

Pressing both the up and down timer keys simultaneously and holding them for 3 seconds will clear the timer and will stop the unit from mixing. The lighted green switch will remain lit in this case.
Maintenance

**WARNING**
Disconnect from the power supply prior to maintenance and servicing.
Refer servicing to qualified personnel.

This shaker will normally require minimal service. However, there may be atmospheric contaminants present which could deteriorate the rubber belt or the bearing lubricant (e.g. nitric acid fumes).

**To Replace Belt**
1. Disconnect from power supply.
2. Remove platform. Take out nine screws in top cover - be sure not to lose lockwashers under screw heads. Remove top cover.
3. From the top, loosen (do not remove) four nuts holding motor. Slide motor toward center of shaker so as to loosen belt. Remove belt.
4. Reverse procedure to install new belt. Slide motor to tighten belt. Belt should be able to be deflected about 1/2 inch with moderate finger pressure for proper tightness. Tighten motor nuts.
5. Replace top cover with nine screws and lockwashers but do not tighten screws as yet — just lightly seat them.
6. With shaker on a level surface, start the shaker with speed control set to 25 rpm. While the top is moving, turn each screw a little at a time. First, one screw in each bearing, then the second, and then the third screw. Keep repeating, turning each screw slightly until they are all tight. In this manner, the screws "find" the position which makes the shaker run most smoothly. If shaker performance is not smooth, repeat steps 4 and 5.

**Parts List**

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLX13</td>
<td>Belt</td>
<td>1</td>
</tr>
<tr>
<td>CR364X1</td>
<td>Cordset - 240 Volt</td>
<td>1</td>
</tr>
<tr>
<td>CR712X1</td>
<td>Cordset - 100/120 Volt</td>
<td>1</td>
</tr>
<tr>
<td>CR720X1</td>
<td>Cordset - 230 Volt</td>
<td>1</td>
</tr>
<tr>
<td>KB720X1</td>
<td>Knob - Adjusting</td>
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<tr>
<td>MTX78</td>
<td>Motor</td>
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<td>PC720X2A</td>
<td>PC Board Assembly - Analog Models</td>
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<td>PC734X1A</td>
<td>PC Board Assembly (Display) - Digital and Digital Oscillating Models</td>
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<td>PC Board Assembly - Digital Models</td>
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<td>PC736X1A</td>
<td>PC Board Assembly - Digital Oscillating Models</td>
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<tr>
<td>SWX135</td>
<td>Switch - On/Off 120V Digital and Digital Oscillating Models</td>
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<td>SWX136</td>
<td>Switch - On/Off 220V-240V Digital and Digital Oscillating Models</td>
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<td>SWX137</td>
<td>Switch - On/Off 120V Analog Models</td>
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<td>SWX138</td>
<td>Switch - On/Off 220V-240V Analog Models</td>
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<td>TNX93</td>
<td>Transformer 120V &amp; 240V</td>
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<td>TNX94</td>
<td>Transformer 100V</td>
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</tbody>
</table>

* (patent #5,375,927)
**UNIVERSAL ACCESSORY HOLDER**
FOR
Big Bills AY491X1A
Bigger Bills AY492X1A

**SINGLE PLATFORMS**
FOR
Big Bills PART NO. CLAMPS
PT734X2A (16" X 16") Accommodates all clamp sizes
PT735X1A (21" X 21") Accommodates all clamp sizes
Bigger Bills

**Bill's Side Wings**
FOR
Big Bills PART NO.
AY720X1
Bigger Bills
AY720X1

**TEST TUBE RACK**
FOR
Big Bills PART NO.
AY734X1 Securely holds your 16 mm X 125 mm test tubes
Bigger Bills AY734X1 to your Bill (42 tubes per rack).

**DOUBLE – TIERED PLATFORMS***
FOR
Big Bills PART NO. CLAMPS
AY491X3A See below.
Bigger Bills AY492X3A
(Tiered platforms include post and screws for stacking)
* Observe Caution for double – tiered platform use (page 6).

**ACCESSORY CLAMPS FOR PLATFORMS**

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>VESSEL SIZE</th>
<th>Big Bill CAPACITY**</th>
<th>Bigger Bill CAPACITY**</th>
<th>Double-Tiered Platform TOTAL PLATFORM CAPACITY**</th>
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<tbody>
<tr>
<td>FCX63</td>
<td>10 ml</td>
<td>111</td>
<td>177</td>
<td>96</td>
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<td>FCX74</td>
<td>2000 ml</td>
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<td>9</td>
</tr>
<tr>
<td>FCX84</td>
<td>4000 ml</td>
<td>5</td>
<td>5</td>
<td>x</td>
</tr>
<tr>
<td>FCX85</td>
<td>6000 ml</td>
<td>5</td>
<td>5</td>
<td>x</td>
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</table>

**Capacities are dependant on flask holder combinations.**

**STICKY WICKET™ NON-SLIP MAT FOR TRAYS, BOWLS, ETC.**
For Big Bill, part # AY797X3 (14’ X 10’)
For Bigger Bill, part # AY797X4 (18’ X 15’)

10
Ordering Procedures

Please refer to the Specification Plate for the complete model number, serial number, and series number when requesting service, replacement parts or in any correspondence concerning this unit.

All parts listed herein may be ordered from the Barnstead|Thermolyne dealer from whom you purchased this unit or can be obtained promptly from the factory. When service or replacement parts are needed we ask that you check first with your dealer. If the dealer cannot handle your request, then contact our Customer Service Department at 319-556-2241 or 800-553-0039.

Prior to returning any materials to Barnstead |Thermolyne Corp., please contact our Customer Service Department for a “Return Goods Authorization” number (RGA). Material returned without a RGA number will be refused. Minimum invoice: $25.
Barnstead|Thermolyne
Two Year Limited Warranty

Barnstead|Thermolyne Corporation warrants that if a product manufactured by Barnstead|Thermolyne and sold by it within the continental United States or Canada proves to be defective in material or workmanship, it will provide you, without charge, for a period of 180 days, the labor, and a period of two (2) years, the parts, necessary to remedy any such defect. Outside the continental United States and Canada, the warranty provides, for two (2) years, the parts necessary to remedy any such defect. The warranty period shall commence either six (6) months following the date the product is sold by Barnstead|Thermolyne or on the date it is purchased by the original retail consumer, whichever date occurs first.

All warranty inspections and repairs must be performed by and parts obtained from an authorized Barnstead|Thermolyne dealer or Barnstead|Thermolyne (at its own discretion). Heating elements, however, because of their susceptibility to overheating and contamination, must be returned to our factory, and if, upon inspection, it is concluded that failure is not due to excessive high temperature or contamination, warranty replacement will be provided by Barnstead|Thermolyne. The name of the authorized Barnstead|Thermolyne dealer nearest you may be obtained by calling 1-800-446-6060 or writing to:

Barnstead|Thermolyne
P.O. Box 797
2555 Kerper Boulevard
Dubuque, IA 52004-0797 USA
FAX: (319) 589-0516
E-Mail: mkt@barnsteadthermolyne.com

Barnstead|Thermolyne’s sole obligation with respect to its product shall be to repair or replace the product. Under no circumstances shall it be liable for incidental or consequential damage.

THE WARRANTY STATED HEREIN IS THE SOLE WARRANTY APPLICABLE TO BARNSTEAD|THERMOLYNE PRODUCTS. BARNSTEAD|THERMOLYNE EXPRESSLY DISCLAIMS ANY AND ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR USE.