

Operating Manual for

Wrist-Action® Laboratory Shaker

Models 75, 85, 95



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Part of TCP Analytical Group

OPERATIONS MANUAL

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**Please read the User Manual carefully before use
and follow all operating and safety instructions!**




WARNING

Do not attempt to assemble, connect to power source, or operate the Burrell Wrist-Action® Shaker without first reading these instructions.

Also assure that each person that will operate this unit becomes familiar with these operating instructions.

SAFE OPERATIONS

1. When operating this unit always wear safety eye protection and suitable safety apparel for the material being shaken.
2. Do not operate this unit unattended.
3. Do not modify this unit or attach any accessory that is not included with the Wrist-Action® Shaker or is not an accessory manufactured by BURRELL SCIENTIFIC, LLC for this unit.
4. Before commencing each operation assure each vessel being shaken is secured in the clamp and that the clamp is tightly attached to the shaft.
5. If the procedure you are following will involve any gases or create a hazardous environment—perform such testing in a properly ventilated fume hood.
6. In all cases shake vessels with closures or rubber stoppers.
7. If any spill occurs, assure all liquids have been cleaned up in a safe manner and the area of operation is completely dry to avoid an electrical hazard.
8. Caution should be taken when operating the shaker with heavy loads or at higher speeds where applicable.

 <p>WARNING</p>	Read the operating instructions completely before use and follow the safety instructions. Ensure that only trained staff work with the shaker.
 <p>PROTECTIVE GROUND CONTACT</p>	Make sure the socket is earthed (protective ground contact) before use.
 <p>DANGEROUS VOLTAGE</p>	The presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

If you encounter any problems with the installation or initial operations of this unit, please contact us at 800-732-8484 or orders@tcpanalytical.com.

UNPACKING YOUR SHAKER

LISTING OF ITEMS

Your shaker should arrive in one or two cartons depending on the accessories purchased. Your shipment should contain the following:

1. The basic shaking unit
2. An inside carton containing:
 - a. Pair of side-arm shafts (in accordance with your order)
 - b. Clamps (in accordance with your order)
 - c. QR Code access to Operating Manual and one hex wrench for attachment of side-arms
 - d. A molded stopper used as a lever arm brake
3. Power cord (adapter shown only included with international orders)

Unpack the shaker carefully and check for any damages that may have occurred during shipment.

Should any damage occur in shipment, do not operate and notify Customer Service at 800-732-8484 or orders@tcpanalytical.com.



Figure 1: Wrist-Action Shaker® Model 75 AA Package Contents

MODEL SPECIFICATIONS & CONTROLS

BURRELL SCIENTIFIC WRIST ACTION® SHAKER – MODEL 75

Our standard unit, the Burrell Scientific Model 75 Wrist Action® Shaker, is designed to operate at 385 oscillations per minute \pm 10%. The action of this shaker simulates the back and forth action of the human wrist. The adjusting lever can achieve an action from a gentle swirl to an aggressive agitation simply by increasing the angle of movement from 1 degree to 15 degrees. Though the actual oscillation speed does not vary, the distance through which the vessels move with each oscillation increases with the change in the lever arm setting from 1–15.

A built-in timer can be set for continuous shaking (°) or from 0 minutes to 60 minutes.



Figure 2: Wrist-Action Shaker® Model 75 AA

MODEL 75 CONTROLS

1. The timer located in the center of the control panel allows for continuous or preset timed operations. To set the timer, turn the timer knob clockwise past 10 minutes, stopping at the desired time. For operations less than 10 minutes, the timer knob must be turned past 10 and then counter clockwise back to the desired setting. For continuous operation, turn the timer counterclockwise to the infinity symbol (∞).
2. The control panel has an On/Off (I/O) rocker switch (red) which also serves as an overload protection device. Should your shaker malfunction, the unit will shut off automatically. To restart it, simply switch it off and then back on. Should it continue to shut down, please contact us for repair.
3. The lever arm on the right of the shaker controls the amplitude of agitation.
 - a. Set the lever arm indicator to "0". Connect the Wrist Action® Shaker to the power source stated on the nameplate. Turn the timer clockwise past 10 minutes, and set your time (described above). Your shaker will not begin agitation until the lever arm is set past "0".
 - b. Gradually move the lever arm past "0" to reach the point of agitation you feel will accomplish your purpose. Record the setting so you can duplicate this procedure in the future.
 - c. We have included in your shipment a molded rubber locking tool (brake) used to prevent creeping of the lever arm. Please slide this brake under the lever knob until the ball rests at the end of the molded groove.



Figure 3: Wrist-Action Shaker® Model 75 Controls

MODEL 75 UNITS

The Model 75 is available in 115 V/60 cycle, 220 V/50 cycle.

REAGENTS #	BURRELL #	MODEL	# OF CLAMP POSITIONS	VOLTAGE	CYCLE
B7750019-Each	075-775-00-19	OO	0	115	60
B7750036-Each	075-775-00-36	OO	0	220	50
B7750419-Each	075-775-04-19	AA	4	115	60
B7750436-Each	075-775-04-36	AA	4	220	50
B7750819-Each	075-775-08-19	BB	8	115	60
B7750836-Each	075-775-08-36	BB	8	220	50
B7751219-Each	075-775-12-19	CC	12	115	60
B7751236-Each	075-775-12-36	CC	12	220	50
B7751619-Each	075-775-16-19	DD	16	115	60
B7751636-Each	075-775-16-36	DD	16	220	50
B7752019-Each	075-775-20-19	EE	20	115	60
B7752036-Each	075-775-20-36	EE	20	220	50
B7752419-Each	075-775-24-19	FF	24	115	60
B7752436-Each	075-775-24-36	FF	24	220	50
B7650819-Each	075-765-08-19	T	0	115	60
B7650836-Each	075-765-08-36	T	0	220	50
B7651219-Each	075-765-12-19	AT	2	115	60
B7651236-Each	075-765-12-36	AT	2	220	50
B7651619-Each	075-765-16-19	BT	4	115	60
B7651636-Each	075-765-16-36	BT	4	220	50
B7652019-Each	075-765-20-19	CT	6	115	60
B7652036-Each	075-765-20-36	CT	6	220	50
B7652419-Each	075-765-24-19	DT	8	115	60
B7652436-Each	075-765-24-36	DT	8	220	50

All Model 75 Shakers operate at 385 osc/min \pm 10% with a recommended max load of 10 lbs.
For a complete list of our Model 75 Wrist-Action® Shakers and accessories, visit www.reagents.com.

BURRELL SCIENTIFIC WRIST ACTION® SHAKER – MODEL 85

Our Simethicone testing model, the Burrell Scientific Model 85 Wrist Action® Shaker, has been modified to meet the requirements for Simethicone testing as described in the current edition of the U.S. Pharmacopoeia. The testing employs a radius of 13.3 ± 0.4 cm (measured from center of shaft to center of bottle), and shakes through an arc of 10 degrees (lever arm set at “~5”) at a frequency of $300 \pm 10\%$ strokes per minute.

Burrell redesigned the internal shaking mechanism and supplies multi SUREGRIP™ Clamps (shafts included) which allow the shaker to achieve the required performance levels for the Simethicone Foaming Solution Test. The shaker meets these professional standards without compromising the Wrist Action® Shaker’s outstanding features. The shaker can be manufactured to accommodate up to 24 vessels, if needed.



Figure 4: Wrist-Action Shaker® Model 85 AA

The Model 85 is available in 115 V/60 cycle and 220 V/50 cycle. Listed below are 4 and 8 vessel units.

MODEL 85 UNITS

REAGENTS #	BURRELL #	MODEL	# OF CLAMP POSITIONS	VOLTAGE	CYCLE
B7750019-Each	075-775-00-19	OO	0	115	60
B7750036-Each	075-775-00-36	OO	0	220	50
B7750419-Each	075-775-04-19	AA	4	115	60
B7750436-Each	075-775-04-36	AA	4	220	50
B7750819-Each	075-775-08-19	BB	8	115	60
B7750836-Each	075-775-08-36	BB	8	220	50

MODEL 85 CONTROLS

1. The timer located in the center of the control panel allows for continuous or pre-set timed operations. To set the timer, turn the timer knob clockwise past 10 minutes, stopping at the desired time. For operations less than 10 minutes, the timer knob must be turned past 10 and then counter clockwise back to the desired setting. For continuous operation, turn the timer counterclockwise to the infinity symbol (∞).
2. The control panel has an On/Off (I/O) rocker switch (red) which also serves as an overload protection device. Should your shaker malfunction, the unit will shut off automatically. To restart it, simply switch it off and then back on. Should it continue to shut down, please contact us for repair.
3. The lever arm on the right of the shaker controls the amplitude of agitation.
4. Set the lever arm indicator to "0". Connect the Wrist Action® Shaker to the power source stated on the nameplate. Turn the timer clockwise past 10 minutes, and set your time (described above). Your shaker will not begin agitation until the lever arm is set past "0".
5. Gradually move the lever arm past "0" to reach the point of agitation you feel will accomplish your purpose. Record the setting so you can duplicate this procedure in the future.
6. We have included in your shipment a molded rubber locking tool (brake) used to prevent creeping of the lever arm. Please slide this brake under the lever knob until the ball rests at the end of the molded groove.

*All Model 85 Shakers operate at 300 osc/min \pm 10% with a recommended max load of 10 lbs.

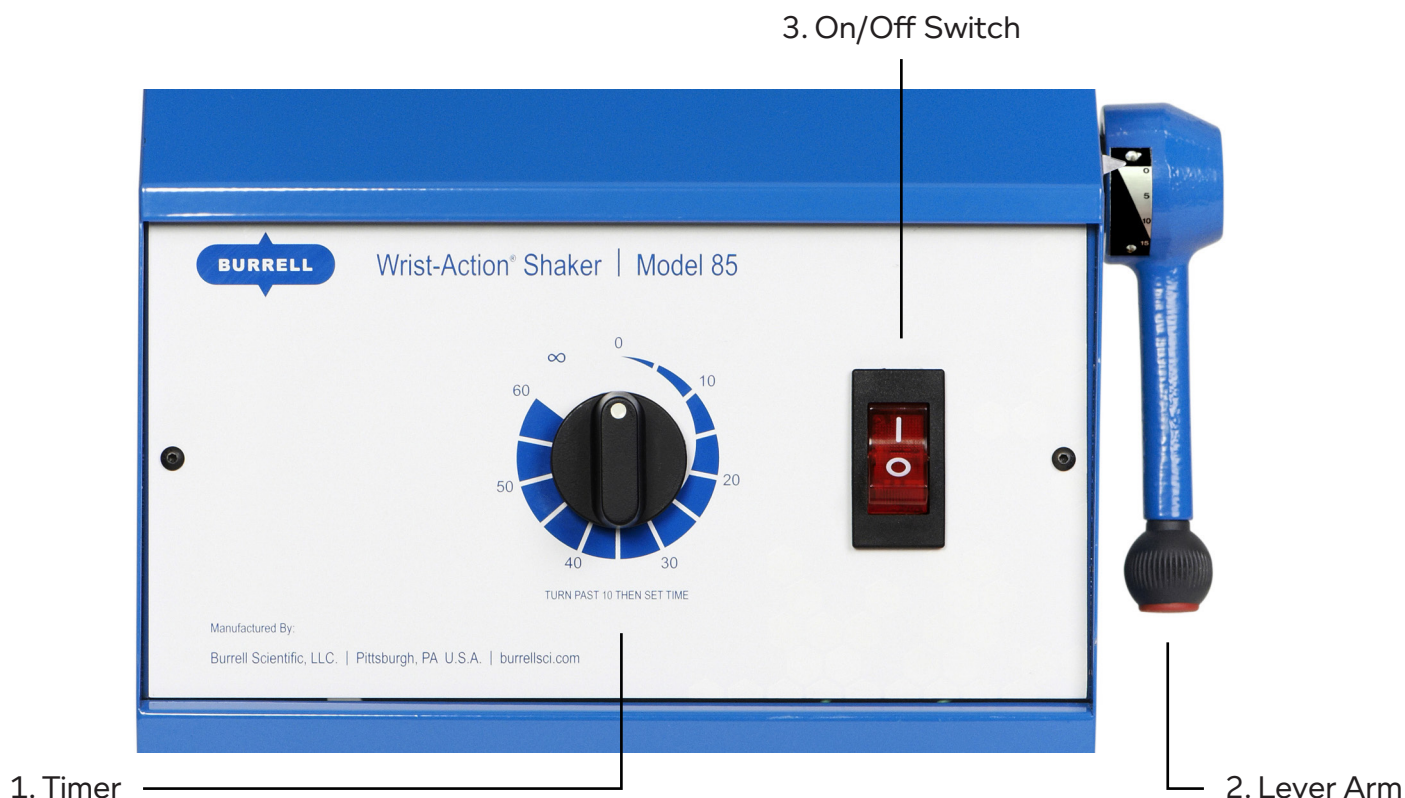


Figure 5: Wrist-Action Shaker® Model 85 Controls

BURRELL SCIENTIFIC WRIST ACTION® SHAKER – MODEL 95

The Burrell Scientific Model 95 Variable Speed Wrist Action® Shaker, is designed to operate from 0 to 450 oscillations per minute. As with the Model 75, the Model 95 simulates the back and forth action of the human wrist. The angle of shaking is adjustable from 0–15 degrees of arc. This unit can be equipped with the standard Finger SUREGRIP™ clamp as well as any of the clamps illustrated in the accessories section.

To change the oscillations simply rotate the knob on the left side of the panel to the desired speed from 0 to 450 oscillations per minute.

Caution: With increased speed and the adjustable degrees of arc, the amount of shaking action can be substantial, so it is always good practice to exercise care when setting these controls. This is especially important when your weight loads are approaching or exceed 8 lbs and/or unbalanced between each side of the shaker. The shaker lock should be used to maintain setting and eliminate drifting of the control arc handle .



Figure 6: Wrist-Action Shaker® Model 95

MODEL 95 CONTROLS

1. The timer located in the center of the control panel allows for continuous or pre-set timed operations. To set the timer, turn the timer knob clockwise past 10 minutes, stopping at the desired time. For operations less than 10 minutes, the timer knob must be turned past 10 and then counter clockwise back to the desired setting. For continuous operation, turn the timer counterclockwise to the infinity symbol (∞).
2. The control panel has an On/Off (I/O) rocker switch (red) which also serves as an overload protection device. Should your shaker malfunction, the unit will shut off automatically. To restart it, simply switch it off and then back on. Should it continue to shut down, please contact us for repair.
3. The lever arm on the right of the shaker controls the amplitude of agitation.
 - a. Set the lever arm indicator to "0". Connect the Wrist Action[®] Shaker to the power source stated on the nameplate. Turn the timer clockwise past 10 minutes, and set your time (described above). Your shaker will not begin agitation until the lever arm is set past "0".
 - b. Gradually move the lever arm past "0" to reach the point of agitation you feel will accomplish your purpose. Record the setting so you can duplicate this procedure in the future.
 - c. We have included in your shipment a molded rubber locking tool (brake) used to prevent creeping of the lever arm at settings above 4. Please slide this brake under the lever knob until the ball rests at the end of the molded groove.
4. The Model 95 is a variable speed shaker. The shaker can operate from 0 to 450 oscillations per minute by adjusting the variable speed control.



Figure 7: Wrist-Action Shaker[®] Model 95 Controls

MODEL 95 UNITS

The Model 95 is available in 115 V/60 cycle and 220 V/50 cycle. Listed below are 4 and 8 vessel units. The shaker can be manufactured to accommodate up to 24 vessels, if needed.

REAGENTS #	BURRELL #	MODEL	# OF CLAMP POSITIONS	VOLTAGE	CYCLE
B7950019-Each	075-795-00-19	OO	0	115	60
B7950036-Each	075-795-00-36	OO	0	220	50
B7950419-Each	075-795-04-19	AA	4	115	60
B7950436-Each	075-795-04-36	AA	4	220	50
B7950819-Each	075-795-08-19	BB	8	115	60
B7950836-Each	075-795-08-36	BB	8	220	50
B7951219-Each	075-795-12-19	CC	12	115	60
B7951236-Each	075-795-12-36	CC	12	220	50
B7951619-Each	075-795-16-19	DD	16	115	60
B7951636-Each	075-795-16-36	DD	16	220	50
B7952019-Each	075-795-20-19	EE	20	115	60
B7952036-Each	075-795-20-36	EE	20	220	50
B7952419-Each	075-795-24-19	FF	24	115	60
B7952436-Each	075-795-24-36	FF	24	220	50
B7955019-Each	075-795-50-19	T	0	115	60
B7955036-Each	075-795-50-36	T	0	220	50
B7955419-Each	075-795-54-19	AT	2	115	60
B7955436-Each	075-795-54-36	AT	2	220	50
B7955819-Each	075-795-58-19	BT	4	115	60
B7955836-Each	075-795-58-36	BT	4	220	50
B7956219-Each	075-795-62-19	CT	6	115	60
B7956236-Each	075-795-62-36	CT	6	220	50
B7956619-Each	075-795-66-19	DT	8	115	60
B7956636-Each	075-795-66-36	DT	8	220	50

* All Model 95 Wrist-Action® Shakers operate at variable speeds with a max recommended load of 10 lbs.

*All Model 95 Wrist-Action® Shakers can operate from 80/240 volts and at 50/60 cycle.

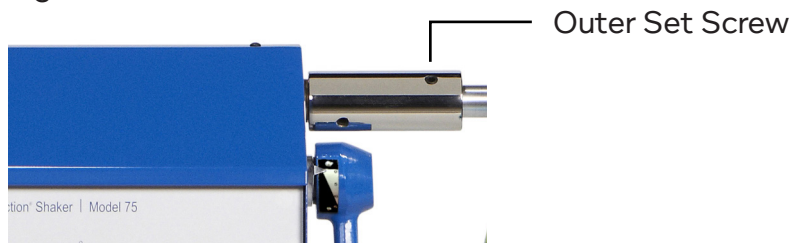
INSTALLATION

SIDE ARM SHAFTS

Note: When side-arm shafts are used in combination with a Top Platform the platform must be installed first. (See Installing the Top Platform on page 15.)

1. Loosen the two side-arm set screws at the outer end of each

Figure 8



2. Position the side-arm shafts in the couplings and tighten the outer set screws.

Figure 9



INSTALLING THE FINGER SUREGRIP™ CLAMPS

1. Loosen the hex head bolt at the bottom of each Finger SUREGRIP™ Clamp so the clamp slides easily on the shaft.
2. Slide the Clamps on the shaft and tighten bolts. A spacing of 4 inches between Clamps is usually adequate clearance between flasks held in the Clamps. (Caution – care should be used in tightening Finger SUREGRIP™ Clamps on the sidearm shaft. Tighten the hex head bolt only until the Clamp is held firmly in position. A nut driver will accomplish this.)
3. Insert your flask between the fingers of Clamp then tighten knurled nut or 3-arm nut until vessel is secure.

Figure 10



INSTALLING THE TOP PLATFORM

1. Move the lever arm until its indicator points to zero (0).
2. Remove the left coupling from the side opposite the lever arm by loosening the two inner set screws in the coupling. Do not remove the right side coupling.
3. Fit the Top Platform over the remaining shaft coupling. Secure, to finger tightness, the clamping bolt of the platform support to the remaining coupling.
4. To replace the shaft coupling removed in step two, slide it through the open left side platform support.

Note that the two inner set screws on the housing end of the coupling should be positioned on the flats of the shaft. Now, tighten the inner set screws on the shaft, adjust the platform until it is centered and level, and securely tighten the platform support clamping bolts.

5. To add flasks to the Top Platform, loosen wing nuts on the rubber clamps and position on both sides of flasks. Securely tighten wing nuts before operation.

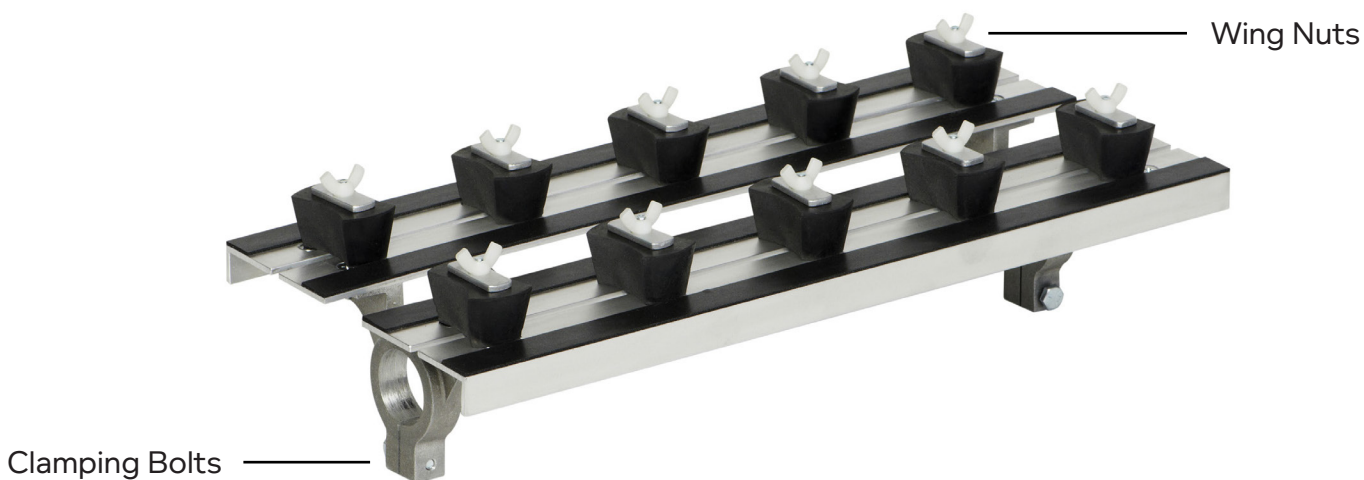


Figure 11: Top Platform

ACCESSORIES

FINGER SUREGRIP™ CLAMPS

Reagents #: B7770000-Each Burrell #: 075-777-00-00

The Finger SUREGRIP™ Clamp has a pair of three-prong, vinyl-sleeved grippers which will handle almost any size or shape flask, bottle, or container, up to 250ml, making them the most adaptable and versatile clamp in the industry. Positioning along the shaft is fully adjustable to accommodate a variety of vessel sizes and shapes.



ACCESSORIES (CONT.)

BASIC SHAFTS

Reagents #: B7780200-2PK Burrell #: 075-778-02-00

The Basic Shafts are sold in pairs, and are used for shaker models AA, BB, CC, DD, EE, and FF. The Basic Shafts can accommodate from 4 vessels up to 24 vessels. For shaker models EE and FF, pillar blocks are also recommended for extra support, for use with the Basic Shaft. Sold in pairs.



SUREGRIP™ VOLUMETRIC CLAMPS

Reagents#: B7771800-Each Burrell #: 075-777-18-00

The SUREGRIP™ Volumetric Clamp was created specifically for volumetric flasks. This clamp contains a bottom support, which was designed to help stabilize the flask and prevent the flask neck from breaking. Holds up to 500ml flasks.



SNAP-N-LOCK CLAMPS

Reagents#: B7772000-Each Burrell #: 075-777-20-00

Snap-N-Lock Clamps are custom-made Clamps created to accommodate various sized bottles. These Clamps are sold individually and are used with Snap-N-Lock shafts. To use, insert a bottle into the bottom plate, then lock the Clamp in place with the easy-to-use lever. Lastly, snap the Clamp onto the lid and pull the lever down to lock it in place. To release, simply pull up on the lever. These Clamps are custom made and designed to fit the customer's exact vessel.



SNAP-N-LOCK SHAFTS

Reagents#: B7800400-2PK Burrell #: 075-780-04-00

The Snap-N-Lock Shafts are sold in pairs and are available to accommodate 4, 8, and 12 custom Clamps. This shaft was specifically designed for the Snap-N-Lock Clamps. To use, slide the Snap-N-Lock Clamp into the designated hole and tighten the Clamp.



SIMETHICONE MULTI CLAMPS

Reagents#: B7830400-2PK Burrell #: 075-783-04-00

Reagents#: B7830800-2PK Burrell #: 075-783-08-00

The Simethicone Multi Clamp is manufactured to meet the U.S. Pharmacopoeia standard and holds up to 3" diameter containers. Additionally, the Simethicone Multi Clamps can also be used to shake larger vessels that Finger SUREGRIP™ Clamps cannot handle.

4 Place Clamp
8 Place Clamp



ACCESSORIES (CONT.)

TOP PLATFORM

Reagents#: B7653100-Each Burrell #: 075-765-31-00

The Top Platform, which fits all shakers except the Mighty Magnum, is the most versatile accessory that can be added to a shaker. With the appropriate clamps and supports, it can hold a variety of glassware, including flasks, funnels, and specimen jars.



SHAKER PILLAR BLOCKS

Reagents#: B7795100-2PK Burrell #: 075-779-51-00

Shaker Pillar Blocks are sold in pairs and offer additional support for EE and FF shaker shafts. These blocks are required with the EE and FF shaker models and must be secured to the laboratory bench top.



BEVERAGE CLAMPS

Reagents#: B7700000-Each Burrell #: 075-770-00-00

Reagents#: B7705000-Each Burrell #: 075-770-50-00

Beverage Clamps are the perfect tool for testing 12-22 ounce bottles as well as 12-16 ounce cans. The design allows for quick vessel changes and is easily adapted to change from bottle to a can. Our Beverage Clamps assist with equilibrium testing during the bottling process, helping to determine the shelf stability of the beverage.

Bottle Clamp
Can Clamp



REPLACEMENT PARTS

3 PRONG CLAMP KNOB

Reagents#: B0005902-Each



HEX WRENCH

Reagents#: B0006462-Each



SHAKER LOCK

Reagents#: B0006646-Each



INTERNATIONAL ADAPTER

Reagents#: B0006820-Each



TOP PLATFORM CLAMPS

Reagents#: B7653200-2PK



POWER CORD

Reagents#: B0006392-Each



MAINTENANCE

Do not attempt any repair of a Burrell Wrist Action® Shaker without consulting a Burrell Technical Representative 800-732-8484. This is required during the warranty period and it is advisable after the expiration of the warranty. Any unauthorized maintenance or repair without Burrell Scientific's written authorization will void the manufacturer's warranty.

Do not return any instrument directly to Burrell Scientific, LLC without first obtaining approval and a Return Goods Authorization (RGA) from BURRELL SCIENTIFIC, LLC. Any shaker returned must be free of hazardous contamination.

All attached side-arm Allen screws and the hex head bolts on the Finger SUREGRIP™ Clamps should be checked before each use. The star nuts on the Clamps should be re-tightened with every use.

WARRANTY

BURRELL SCIENTIFIC, LLC warrants that your Wrist Action® Shaker, manufactured by Burrell, shall be free of defects in materials and workmanship for one (1) year from the earliest of (1) the date the product is sold by Burrell or (2) the date the product is purchased by the original dealer partner. Except as stated above, BURRELL SCIENTIFIC, LLC MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, WITH RESPECT TO THE PRODUCTS AND EXPRESSLY DISCLAIMS ANY AND ALL WARRANTIES INCLUDING BUT NOT LIMITED TO, WARRANTIES OF DESIGN, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

An authorized representative of Burrell must perform all warranty inspections. In the event of a defect covered by Burrell's warranty, Burrell shall, at its sole obligation and exclusive remedy, provide free replacement parts for 1 year. In addition Burrell shall provide free labor for a period of 90-days for those customers within the continental United States and Canada.

BURRELL SCIENTIFIC's warranty provided here under shall be null and void and without further force or effect if there is any: (1) repair made to the product by a party other than Burrell Scientific, or its duly authorized service representatives. (2) misuse (including use inconsistent with written operating instructions for the product), mishandling, contamination, exposure to extreme conditions, modifications or alteration of the product by any customer or third party. (3) use or replacement parts that are obtained from a party who is not an authorized distributor of BURRELL SCIENTIFIC, INC.

IN NO EVENT SHALL BURRELL SCIENTIFIC BE LIABLE TO ANY PARTY FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, OR FOR ANY DAMAGES RESULTING FROM LOSS OF USE OR PROFITS, ANTICIPATED OR OTHERWISE, ARISING OUT OF OR IN CONNECTION WITH THE SALE, USE OR PERFORMANCE OF ANY PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, TORT (INCLUDING NEGLIGENCE), ANY THEORY OF STRICT LIABILITY OR REGULATORY ACTION.