

**BURRELL**

Operating Manual for  
**Wrist-Action®**  
**Laboratory**  
**Shaker**  
**Models 75, 85, 95**



*Wrist Action® Shaker Model 75 BT  
(shown with Top Platform)  
Item # 075-765-16-19*

**Burrell Scientific, LLC**

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# OPERATIONS MANUAL

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

## OPERATING 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.*

*220 V shakers are CE approved and comply with UL/CSA 61010-1 requirements, comply with EN 61010-1 safety requirements and meet EN 61326-1: 2006 electrical equipment for measurement, control and laboratory use EMC requirements.*

# 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. This product must be used with UL/CSA certified power supply cord set.
9. Caution should be taken when operating the shaker with heavy loads or at higher speeds where applicable.

 <b>WARNING</b>	<i>Read the operating instructions completely before use and follow the safety instructions. Ensure that only trained staff work with the shaker.</i>
 <b>PROTECTIVE GROUND CONTACT</b>	<i>Make sure the socket is earthed (protective ground contact) before use.</i>
 <b>DANGEROUS VOLTAGE</b>	<i>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.</i>

*If you encounter any problems with the installation or initial operations of this unit, please contact us at: 412-747-2111 or 1-800-637-6074.*

# 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:
  - Pair of side-arm shafts (in accordance with your order)
  - Clamps (in accordance with your order)
  - An envelope containing instructions and one Allen wrench for attachment of side-arms
  - 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 Burrell Scientific Customer Service department at 1-800-637-6074.***

Fig. 1



# MODEL SPECIFICATIONS & CONTROLS

## MODEL 75 SPECIFICATIONS

### 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.

Fig. 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 ( $\infty$ ).
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.
  - 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".
  - 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.
  - 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.



Model 75 Controls

## MODEL 75 CONTROLS

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

Also available but not listed in: (115 V/50 cycle 220 V/60 cycle).

CATALOG #	MODEL	NUMBER OF CLAMP POSITIONS	VOLTAGE	CYCLE
075 775 00 19	OO	0	115	60
075 775 00 36	OO	0	220	50
075 775 04 19	AA	4	115	60
075 775 04 36	AA	4	220	50
075 775 08 19	BB	8	115	60
075 775 08 36	BB	8	220	50
075 775 12 19	CC	12	115	60
075 775 12 36	CC	12	220	50
075 775 16 19	DD	16	115	60
075 775 16 36	DD	16	220	50
075 775 20 19	EE	20	115	60
075 775 20 36	EE	20	220	50
075 775 24 19	FF	24	115	60
075 775 24 36	FF	24	220	50
075 765 08 19	T	0	115	60
075 765 08 36	T	0	220	50
075 765 12 19	AT	2	115	60
075 765 12 36	AT	2	220	50
075 765 16 19	BT	4	115	60
075 765 16 36	BT	4	220	50
075 765 20 19	CT	6	115	60
075 765 20 36	CT	6	220	50
075 765 24 19	DT	8	115	60
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, please visit our website.

## MODEL 85 SPECIFICATIONS

### 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  $13.3 \pm 0.4$  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.

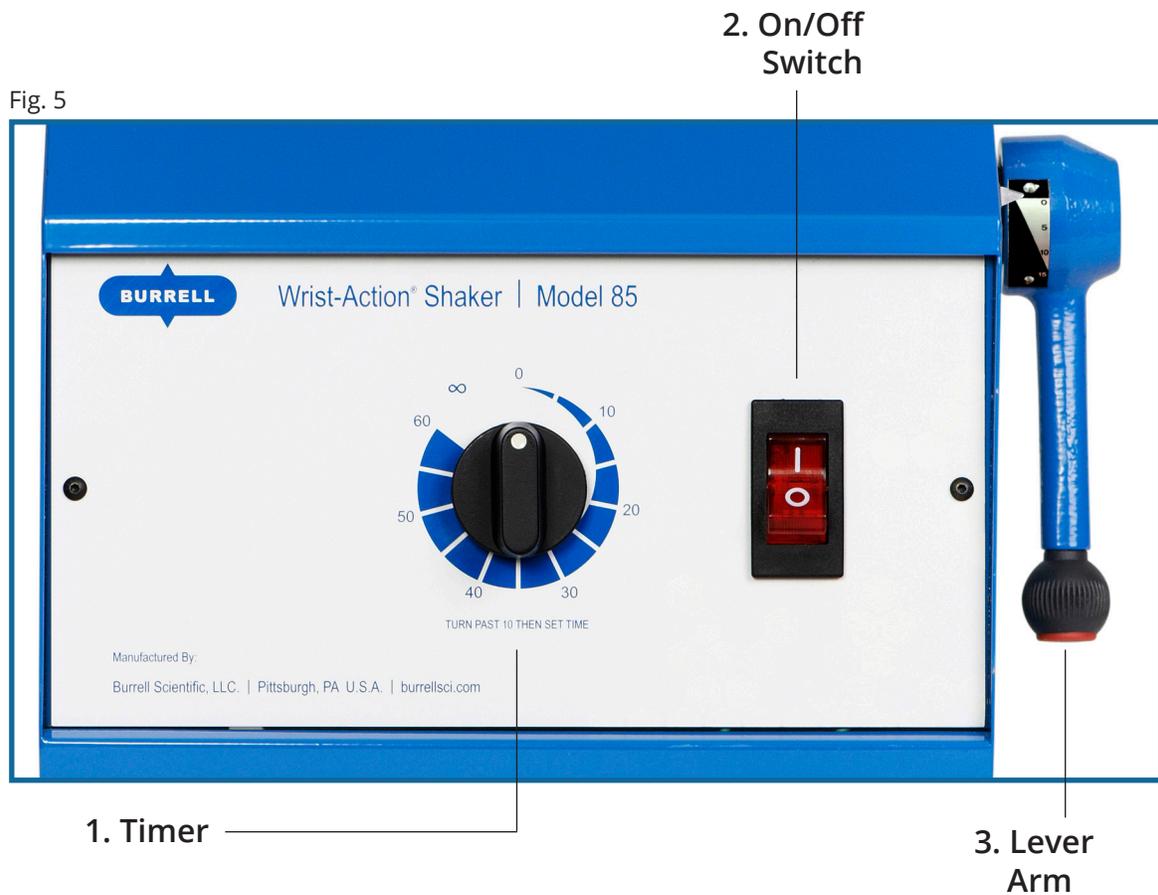
Fig. 4



Wrist Action® Shaker – Model 85 AA

## 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.
  - 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".
  - 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.
  - 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.



Model 85 Controls

## MODEL 85 UNITS

The Model 85 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.

CATALOG #	MODEL	NUMBER OF CLAMP POSITIONS	VOLTAGE	CYCLE
075 785 00 19	OO	0	115	60
075 785 00 36	OO	0	220	50
075 785 04 19	AA	4	115	60
075 785 04 36	AA	4	220	50
075 775 08 19	BB	8	115	60
075 775 08 36	BB	8	220	50

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

\* For a complete list of our Model 85 Wrist Action® Shakers and accessories, please visit our website.

## MODEL 95 SPECIFICATIONS

### 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 the increased speed and the adjustable degrees of arc, the amount of shaking action can be substantial so it is always a good practice to exercise care when setting these controls. This is especially important when your weight loads are approaching or exceed 8 lbs.

Fig. 6



## 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.
  - 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".
  - 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.
  - 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.



Model 95 Controls

## MODEL 95 UNITS

The Model 85 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.

CATALOG #	MODEL	NUMBER OF CLAMP POSITIONS	VOLTAGE	CYCLE
075 795 00 19	OO	0	115	60
075 795 00 36	OO	0	220	50
075 795 04 19	AA	4	115	60
075 795 04 36	AA	4	220	50
075 795 08 19	BB	8	115	60
075 795 08 36	BB	8	220	50
075 795 12 19	CC	12	115	60
075 795 12 36	CC	12	220	50
075 795 16 19	DD	16	115	60
075 795 16 36	DD	16	220	50
075 795 20 19	EE	20	115	60
075 795 20 36	EE	20	220	50
075 795 24 19	FF	24	115	60
075 795 24 36	FF	24	220	50
075 795 50 19	T	0	115	60
075 795 50 36	T	0	220	50
075 795 54 19	AT	2	115	60
075 795 54 36	AT	2	220	50
075 795 58 19	BT	4	115	60
075 795 58 36	BT	4	220	50
075 795 62 19	CT	6	115	60
075 795 62 36	CT	6	220	50
075 795 66 19	DT	8	115	60
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.

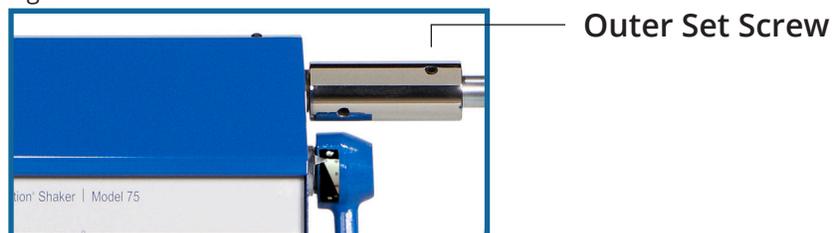
# INSTALLATION

## 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 shaft coupling, using the Allen wrench included. Do not adjust the two inner set screws.

Fig. 8



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

Fig. 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 side-arm 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.

Fig. 10



## INSTRUMENT MAINTENANCE

Do not attempt any repair of a Burrell Wrist Action® Shaker without consulting a Burrell Technical Representative (800-637-6074). 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.

## 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.

Fig. 11



Top Platform #075-765-31-00

## ACCESSORIES

### Finger SUREGRIP™ Clamps

Item #: 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.



### Basic Shafts

Item #: 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

Item #: 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

Item #: 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

Item #: 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

Item #: 075-783-04-00

Item #: 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..



## Separatory Funnel Jaw Clamps (Top Platform)

Item #: 075-777-06-00

Top Platform can hold up to four 250 ml vessels and with the large capacity clamps it can hold two vessels from 500 to 2000 ml. With the large clamps, adjustable "C" rings help to achieve the funnels optimal agitation angle. With additional bronze clips, Separatory Funnel Clamps can also be used with the side-arm shaft.



## Top Platform

Item #: 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

Item #: 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

Item #: 075-770-00-00 (bottle clamp)

Item #: 075-770-50-00 (can clamp)

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.



## WARRANTY

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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.







LABORATORY INSTRUMENTS, CHEMICALS AND SUPPLIES SINCE 1917

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