

OPERATION MANUAL

MANUAL NO. 056-707-00
REV. F

LAB-LINE® **DUAL-ACTION ORBITAL/RECIPROCATING** **SHAKER**

MODEL NO_s. | 3508
3508-1
3508-1CE



LAB-LINE INSTRUMENTS, INC.

DESIGNERS AND MANUFACTURERS

A SUBSIDIARY of Barnstead|Thermolyne

1999 North 15th Ave., Melrose Park, IL 60160-1491 USA

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INTRODUCTION

THANK YOU

for selecting Lab-Line Instruments for your equipment needs. For maximum value and ease of start-up,

PLEASE PROCEED AS FOLLOWS:

- Inspect the carton and contents for shipping damage. Notify the carrier immediately if damage is found.
- Use the Accessory Checklist when unpacking to verify that the complete unit has been received. Do not discard packing materials until all is accounted for.
- Read this Operation Manual thoroughly *before* deciding upon an appropriate location for the unit: you will want to consider the availability of power and other unit requirements, as well as user convenience.
- Insist that every operator of this unit becomes familiar with the Operation Section of this manual.
- Be sure to fill out the Warranty Registration Card and mail it in to Lab-Line Instruments within seven (7) days after receiving the unit.

IF

after reading this manual you should have any difficulties with the installation or operation instructions, please call:

Lab-Line Customer Relations Department
(319) 556-2241 or (800) 522-5463

ALL RIGHT RESERVED

The information contained in this manual is the exclusive property of Lab-Line Instruments, Inc., and has been provided solely to enable the users of the equipment described herein to operate and maintain such equipment. Any other use of this information, or the reproduction or transmission of all or any portion of this manual without prior written consent of the manufacturer is expressly prohibited. © 2000, Lab-Line Instruments, Inc.

SAFE OPERATION

BE ADVISED:

READ OPERATION MANUAL BEFORE USING EQUIPMENT TO FAMILIARIZE YOURSELF THE CONTROLS AND ACCESSORIES.

WHEN OPERATING THIS EQUIPMENT, ALWAYS WEAR PROTECTIVE CLOTHING, GLASSES AND OTHER ACCESSORIES AS SPECIFIED BY THE SAFETY REGULATIONS OF YOUR ORGANIZATION.

WE RECOMMEND THAT YOU DO NOT LEAVE EQUIPMENT UNATTENDED WHILE IT IS IN OPERATION. DO NOT OPERATE EQUIPMENT WITH A DAMAGED ELECTRICAL CORD OR ALLOW CORD TO COME INTO CONTACT WITH A HOT SURFACE. DO NOT OPERATE EQUIPMENT IN AN EXPLOSIVE ATMOSPHERE. DO NOT INSERT FINGERS INTO EQUIPMENT WHEN IT IS OPERATING.

DO NOT MODIFY CONSTRUCTION AND/OR ASSEMBLY OF EQUIPMENT. KEEP GUARDS IN PLACE. DO NOT REMOVE TAGS, LABELS, DECALS OR OTHER INFORMATION FROM THE UNIT.

MAKE SURE ALL VESSELS ARE SECURELY CLAMPED BEFORE TURNING ON UNIT. DO NOT OPERATE THE UNIT AT SPEEDS THAT WILL CAUSE THE CONTENTS OF VESSELS TO BE THROWN OUT. WHEREVER POSSIBLE, VESSELS SHOULD BE STOPPERED TO PREVENT HAZARDOUS SUBSTANCES BEING THROWN OUT DURING THE MIXING ACTION. USE EXTRA CAUTION WITH HOT OR VOLATILE SUBSTANCES SO THAT PRESSURE BUILDUP IN CONTAINER(S) DOES NOT CAUSE THE STOPPER TO BLOW OFF. DO NOT RUN EQUIPMENT WITH AN UNBALANCED LOAD. DO NOT EXCEED RECOMMENDED LOAD.

IF SHAKING ACTION WILL RESULT IN THE EVOLUTION OF GASES OR FUMES, CARRY OUT THE OPERATION UNDER A WELL-VENTILATED LABORATORY HOOD.

TO ELIMINATE HAZARD OF ELECTRICAL SHOCK, MAKE SURE FLOOR AROUND MACHINE IS DRY IN THE EVENT OF ACCIDENTAL SPILLING OR SPLASHING OF LIQUIDS, CLEAN UP AND/OR NEUTRALIZE THE SPILLED LIQUIDS BEFORE CONTINUING.

SAFE OPERATION: (Con't)

DO NOT USE EQUIPMENT FOR OTHER THAN ITS INTENDED PURPOSE. USE ONLY THE ACCESSORIES AND ATTACHMENTS THAT ARE SHIPPED WITH THE EQUIPMENT OR ARE SPECIFIED FOR IT. OTHER ACCESSORIES CAN PRODUCE HAZARDS OR MAKE THE UNIT INOPERATIVE.

DO NOT OPERATE SHAKER FOR EXTENDED PERIODS UNDER HIGH HUMIDITY CONDITIONS. DO NOT OPERATE SHAKER IN AMBIENT TEMPERATURES EXCEEDING 40°C. DO NOT OPERATE SHAKER IN A CO₂ ENRICHED ATMOSPHERE.

PERFORM REGULAR MAINTENANCE SERVICE AS SPECIFIED IN THIS MANUAL AND KEEP UNIT IN GOOD REPAIR. DO NOT OPERATE WITH KNOWN DEFECTS. ALWAYS DISCONNECT EQUIPMENT FROM POWER SOURCE BEFORE SERVICING OR PERFORMING ANY MAINTENANCE PROCEDURES.

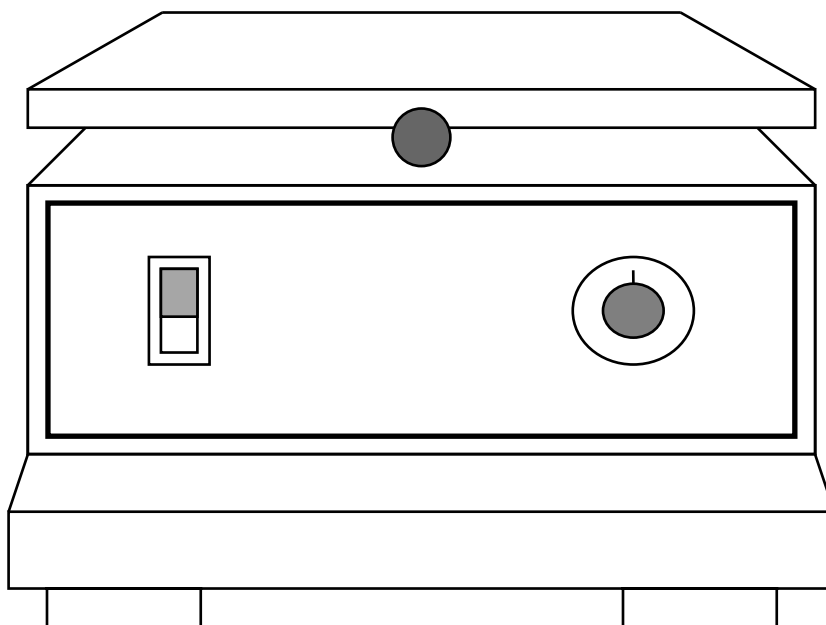
DESCRIPTION

The Lab-Line Dual-Action Orbital/Reciprocating Shaker is sturdy, heavy-duty and designed to produce either a 3/8-inch circular shaking motion or a 3/8-inch linear shaking motion. This versatility is increased through the availability from Lab-Line of interchangeable shaking platforms and clips to accommodate a variety of laboratory vessels and glassware. Rubber feet on the unit provide stability.

Switching from one type of shaking motion to the other is accomplished easily by moving a control lever on the front of the unit to either of two positions: left for a reciprocating motion; right for an orbital motion. It is not necessary to stop the Shaker to change motion.

Shaking speed for either of these two shaking motions can be varied and controlled from approximately 50 to 400 rpm, depending on the load of the vessels on the platform and the laboratory procedure or experiment being conducted. A solid-state speed control is provided for this purpose.

Model 3508 is a 120-volt unit and Model 3508-1(CE) is a 240-volt unit.



SPECIFICATIONS

POWER REQUIREMENTS: Model 3508: 120 V, 50/60 Hz, 100W, 0.8 Amps
Model 3508-1(CE): 240 V, 50/60 Hz, 100W, 0.4 Amps

DUTY CYCLE: Continuous

SHAKING SPEED: 50 to 400 rpm

MAXIMUM LOAD: 15 lbs. (7 kg). (Heavier loads can be shaken at lower speeds but linear motion may become erratic.)

SHAKER MOVEMENT: 3/8-inch (0.9 cm) orbital or linear.

DIMENSIONS:

Overall: 11½"W x 14"D x 7¾"
(29 x 36 x 20 cm)

Platforms: 13" x 11" (33 x 28 cm)
18" x 18" (46 x 46 cm)

SHIPPING WEIGHT: 36 lbs. (16 kg)

UNIT'S ENVIRONMENTAL OPERATING CONDITIONS:

POLLUTION DEGREE: 2

INSTALLATION CATEGORY: II

ALTITUDE: 2000 Meters MSL (Mean Sea Level)

HUMIDITY: 80% maximum, non-condensing

ELECTRICAL SUPPLY: 120VAC or 240VAC

VOLTAGE TOLERANCE: ±10% of normal rated line

TEMPERATURE: 15°C to 40°C

PRODUCT USAGE: This product is intended for use indoors **only**

INSTALLATION

✓*SHIPPING CARTON:*

This should be inspected upon delivery. When received, carefully examine for any shipping damage before unpacking. If damage is discovered, the delivering carrier should both specify and sign for the damage on your copy of the delivery receipt.

Open the carton carefully making certain that all parts are accounted for before packaging materials are discarded—after unpacking, if damage is found, promptly report it to the carrier and request a damage inspection promptly.

IMPORTANT: Failure to request an inspection of damage within a few days after receipt of shipment absolves the carrier from any liability for damage: you must call for a damage inspection promptly.

LOCATION:

Place the shaker on a level surface in a convenient location and near a properly grounded electrical power outlet that matches the requirements of the unit indicated on its nameplate. A minimum of 1-inch of clearance is required on all sides to allow unobstructed orbiting.

PLATFORM INSTALLATION:

Select the appropriate platform for the laboratory vessels or glassware to be shaken. Tighten the 4 thumbscrews at each corner to secure the platform to the shaker. Make sure both sides of the platform are outside of the mounting plate.

ELECTRICAL REQUIREMENTS:

Model 3508 requires a 120 VAC, 50/60 Hz power source, Model 3508-1(CE), 240 VAC, 50/60 Hz.

The shaker is supplied with a 3-wire line cord and it is necessary to connect it to an outlet wired for 3-prong plugs. If an extension cord is used, it also should be the 3-wire grounded type.

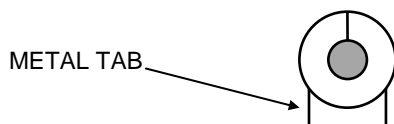
For an outlet designed to accept 2-prong plugs (ungrounded), it is required that a qualified electrician replace the outlet with a new grounded outlet. If a plug must be installed, use only the 3-prong grounded type, rated for the unit load requirements and matching the power outlet. Make sure the green ground wire is secured to the plug ground terminal.

It is best to leave the unit disconnected when not in use.

OPERATION

DANGER: DO NOT USE IN THE PRESENCE OF FLAMMABLE OR COMBUSTIBLE MATERIALS OR EXPLOSIVE GASES. FIRE OR EXPLOSION MAY RESULT CAUSING DEATH OR SEVERE INJURY

NOTE: DEPRESS METAL TAB PRIOR TO ROTATING KNOB—THE TAB FIXES KNOB SETTING AND PREVENTS INADVERTENT MOTION OF THE KNOB.



Located on the control panel are power switch, control lever for 2 types of shaking motion and the speed control knob. The shaker is off when the power switch is not lit. Keep speed control knob turned to a full counterclockwise position before starting unit.

STARTING THE SHAKER:

Select shaking platform and fasten securely to shaker. Insert vessels to be shaken. Be careful to fill vessels to levels that will not splash or spill as a result of the shaking action. Whenever possible, use stoppers in vessels to prevent accidental spills.

Select type of shaker motion by pushing lever (with knob) either to the left for reciprocating motion or to the right for orbital motion.

Press in top half of rocker switch to start shaker.

OPERATION: (Con't)

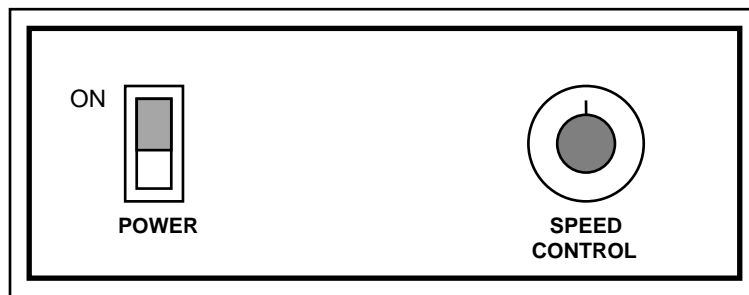
SETTING THE SPEED CONTROL:

Rotate speed control knob slowly clockwise until the desired shaking speed is attained. The operator should use caution in setting the speed, so that the vessels do not come out of their holders or spill their contents. The maximum safe speed varies with the load. A heavier load will need to be shaken more slowly.

To stop the shaker, turn the speed control fully counterclockwise and press in the lower half of the power switch.

If the shaker will not be used again soon, disconnect the plug from its outlet.

CONTROL PANEL



#440-375-00 (SWITCH)*

560-223-00 (KNOB)*

*AS LISTED ON UPCOMING REPLACEMENT PARTS LIST

MAINTENANCE

BE ADVISED:

NOTE: MAKE NO ATTEMPT TO SERVICE OR REPAIR A LAB-LINE PRODUCT UNDER WARRANTY BEFORE CONSULTING YOUR LAB-LINE DEALER. AFTER THE WARRANTY PERIOD, SUCH CONSULTATION IS STILL ADVISED, ESPECIALLY WHEN THE REPAIR MAY BE TECHNICALLY SOPHISTICATED OR DIFFICULT.

IF ASSISTANCE IS NEEDED BEYOND WHAT THE DISTRIBUTOR CAN PROVIDE, PLEASE CALL THE LAB-LINE CUSTOMER RELATIONS DEPARTMENT AT (319) 556-2241 OR (800) 522-5463. NO MERCHANDISE, HOWEVER, SHOULD BE RETURNED DIRECTLY TO LAB-LINE WITHOUT PRIOR APPROVAL FROM LAB-LINE.

PREVENTIVE MAINTENANCE (with every 3 months of constant use):

WARNING: TO AVOID RISK OF ELECTRIC SHOCK, DISCONNECT EQUIPMENT FROM POWER SOURCE BEFORE PERFORMING ANY MAINTENANCE.

- Remove the platform by loosening the 4 thumbscrews. Remove the platform mounting plate by removing the 4 flathead screws that hold it to the rubber mounts. Inspect the drive belt and pulleys for wear. Order a replacement if necessary.
- Check the 4 rubber mounts for cracks, wear or looseness. If these conditions are noted, replace or tighten the mounts.
- Remove 4, 1/4-inch hex bolts from the drive plate. Lift the plate out and turn it over to expose the motor—take care not to strain the wires. 2 brushes are located under plastic caps on opposite sides of the lower part of the motor. Unscrew the plastic caps and slide the brushes out. Replace the brushes when they are worn down to 3/16 of an inch or less in length.

NOTE: IF A SINGLE BRUSH IS WORN, **BOTH** MUST BE REPLACED.

- Reassemble the unit carefully by reversing the preceding steps.

MAINTENANCE: (Con't)

REPLACING PARTS: SPEED CONTROL

WARNING: TO AVOID RISK OF ELECTRIC SHOCK, DISCONNECT EQUIPMENT FROM POWER SOURCE BEFORE PERFORMING ANY MAINTENANCE.

- Speed control replacement requires removal of the control panel. Remove the 2 screws that hold the panel and bring the panel forward.

To replace the speed control, remove the control knob (2 setscrews) and a retaining nut to separate it from the panel. Unplug the terminal connections from the old control unit and plug them into the new one. Reverse this sequence to put the control unit and panel back in place.

REPLACING PARTS: SPEED CONTROL CALIBRATION

WARNING: BE CAREFUL TO AVOID INADVERTENT CONTACT WITH LIVE ELECTRICAL PARTS WHILE PERFORMING THESE OPERATIONS.

- Turn on the power. Slowly rotate the speed control knob clockwise—verify shaker rotates counterclockwise.
- Speed control adjustment: Rotate speed control knob fully counterclockwise. Adjust speed control **MIN** pot for “just off” shaking.
- Adjust the speed control to maximum clockwise setting. Using the tachometer, read the RPM—it should read 400 RPM. If not, adjust the **MAX** pot so that the shaker runs at 400 RPM with the speed control at the maximum clockwise setting.

REPLACING PARTS: SWITCH

- Switch replacement requires removal of the control panel. Remove the 2 screws that hold the panel and bring the panel forward. To replace the switch, disconnect the wires. The switch is a snap-in type. Squeeze the tangs together and push the switch through the front of the panel. Install the new switch and replace the wires.

MAINTENANCE: (Con't)

REPLACING PARTS: BELT

- Replacement of the belt is accomplished by removing the platform mounting plate to expose the belt. Remove the old belt. Clean the pulley grooves with a solvent such as alcohol or mineral spirits. Install the new belt by stretching over the pulleys, center-distance is factory set and belt requires no further tensioning. Plug unit in and run slowly.

CAUTION: WITH PLATFORM MOUNTING PLATE REMOVED, UNIT IS OUT OF BALANCE AND WILL "WALK" IF IT IS NOT ATTENDED. BE SURE SPEED CONTROL IS AT ITS LOWEST SETTING BEFORE STARTING AND THEN INCREASE SPEED SLOWLY. DO NOT LEAVE UNIT UNATTENDED WHILE IT IS RUNNING.

- With the unit unplugged, reassemble the unit carefully by following the reverse order from the above.

ABOUT LUBRICATION OF BEARINGS:

The shaking mechanism is equipped with permanently lubricated bearings that do not require further lubrication or adjustment.

LUBRICATION OF GUIDES AND ROLLERS:

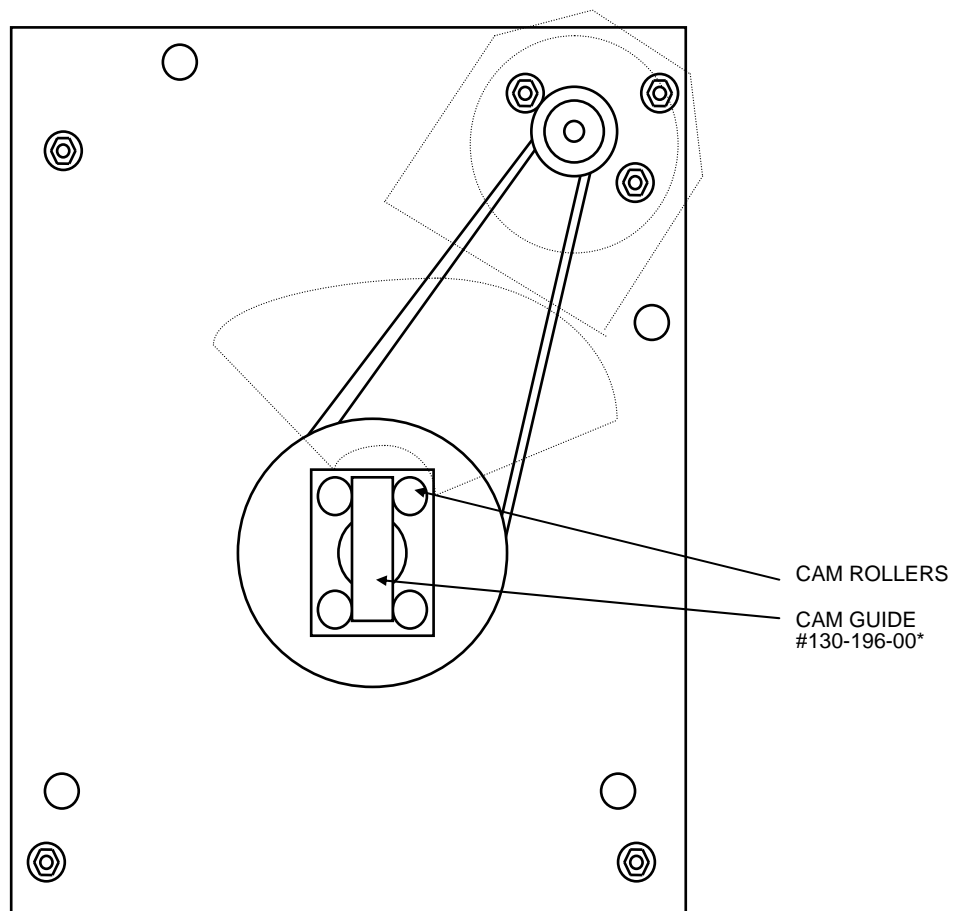
(See next page for illustration)

- Turn the platform mounting plate upside down. Wipe off old grease from the cam guide and cam rollers. Re-grease the guide and rollers.

MAINTENANCE: (Con't)

REPLACING PARTS: (Con't)

VIEW OF CAM GUIDE AND ROLLERS:



*AS LISTED ON UPCOMING REPLACEMENT PARTS LIST

REPLACEMENT PARTS

DESCRIPTION	PART NUMBER
Bearing Plate Assembly:	014-966-00
Cam Roller Guide:	130-196-00
Cordset:	470-132-00
Drive Belt:	150-299-00
Eccentric Shaft Crank Assembly:	150-298-00
Knob, Selector:	560-015-00
Motor:	370-275-00
Motor Brushes (set of 2):	370-277-01
Mount, Flexible (4 required):	790-296-00
Platform Mat:	790-316-11
Pulley, Motor:	150-297-00
Speed Control Assembly:	227-598-00
Speed Control Knob:	560-223-00
Switch, Rocker:	440-375-00
Transformer (240V unit):	460-139-00
Mounting Feet::	790-087-00
<i>Wiring Schematics:</i>	
3508, 3508-1:	227-783-00
3508-1CE:	228-823-00

NEED A PART? CALL THE LAB-LINE PARTS HOTLINE.
 CALL: (319) 556-2241 or (800) 522-5463; FAX: (319) 589-0516.

LAB-LINE RESERVES THE RIGHT TO MAKE CHANGES TO SPECIFICATIONS WITHOUT PRIOR NOTICE.

WARRANTY

Page 1 of 2

LAB-LINE INSTRUMENTS, INC. ("Lab-Line") warrants that the product manufactured by Lab-Line shall be free of defects in materials and workmanship for a period of time defined on the following page from the first to occur of (i) the date the product is sold by Lab-Line or (ii) the date the product is purchased by the original retail customer (the "Commencement Date"). Except as expressly stated above,

LAB-LINE 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 Lab-Line must perform all warranty inspections. In the event of a defect covered by Lab-Line's warranty, Lab-Line shall, as its sole obligation and exclusive remedy, provide free replacement parts to remedy the defective product. In addition, for products sold by Lab-Line within the continental United States or Canada, Lab-Line shall provide free labor to repair the products with the replacement parts, but only for a period of ninety (90) days from the Commencement Date.

Lab-Line's warranty provided hereunder shall be null and void and without further force or effect if there is any (i) repair made to the product by a party other than Lab-Line or its duly authorized service representative, (ii) misuse (including use inconsistent with written operating instructions for the product), mishandling, contamination, overheating, modification or alteration of the product by any customer or third party or (iii) use of replacement parts that are obtained from a party who is not an authorized dealer of Lab-Line.

IN NO EVENT SHALL LAB-LINE 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.

The name of your nearest authorized Lab-Line dealer may be obtained by calling 1-800-522-5463.



DESIGNERS AND MANUFACTURERS

A SUBSIDIARY of Barnstead|Thermolyne

1999 North 15th Ave., Melrose Park, IL 60160-1491 USA

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WARRANTY

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12 MONTH PARTS WARRANTY:

- All Environmental Chambers
- Low Temperature B. O. D. Incubators
- Animal Study Chamber
- Controlled Environment Centers
- Biological Work Station
- Refrigerators, Freezers
- Chromatography Refrigerators (5 year parts warranty on compressor only)
- Large Capacity Refrigerators and Freezers (5 year parts warranty on compressor only)

24 MONTH PARTS WARRANTY:

- Frame Clamps, Frame Sets, Lab Jacks
- Saybolt Viscosimeter
- Timers, Samplers, Flasks
- Saf-T-Shield, Safety Tongs
- All Incubators & Ovens
- Dual Action Open Air Shaker
- Reciprocating Shakers (open air and water bath)
- Rockers and Rotators
- Low Cost Shakers
- Environ Blok Shaker
- Titer Plate Shaker
- Multi Wrist Shaker
- Water Baths (excluding Aquabaths), Ultrasonic Cleaners
- Slide Warmers
- Mixers, Stirrers, Hotplates
- Thermal Cyclers
- Blok Heaters
- Aquabaths, lifetime warranty on heaters

LIFETIME PARTS WARRANTY:

- All **ORBITAL** Shakers (not carrying a 24 month parts warranty) offer a lifetime parts warranty on the drive mechanism and a 5 year warranty on all other parts
- Refrigerated Orbital Shakers carry a lifetime warranty on the drive mechanism, 1 year parts warranty on the compressor, and a 5 year warranty on all other parts.



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AND EDUCATION
SINCE 1908.**

ACCESSORY CHECKLIST

The following loose parts and accessories are packed with this unit. Before discarding any packing materials, please be sure that nothing has been overlooked.

MODEL NOS. : 3508, 3508-1, 3508-1CE

CHECKED BY: _____

DATE _____

PACKED BY _____

CHECKED	ITEM	PART NUMBER	QUANTITY
_____	Operation Manual	056-707-00	1
_____	Thumb Screw	562-184-10	4
_____	Warranty Card	528-020-00	1