Thermo
Scientific

Lab-Line Bench Top Incubated Shaker

OPERATION AND REPAIR MANUAL
AND PARTS LIST

Model Numbers

3527
3527-1
35271
3527-1CE
3527-5
35275

Lab-Line

Additional comments:
057-149-00
Rev D 9/01

9/01

OPERATION MANUAL

MANUAL NO. 057-149-00
REV. D

LAB-LINE®
BENCH TOP INCUBATED SHAKERS

MODEL NO.
3527, 3527-1, 3527-1CE
HIGH TEMPERATURE
3527-5, 3527-5JPN, 3527-6

DESIGNERS AND MANUFACTURERS
A SUBSIDIARY of Barnstead|Thermolyne
1999 North 15th Ave., Melrose Park, IL 60160-1491 USA
PHONE: (563) 556-2241 or (800) 522-5463; FAX: (563) 589-0516

CE

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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, hook-ups 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
(800) 522-5463 or (563) 556-2241;

SECTION 2

DESCRIPTION

Lab-Line's Bench Top Incubated Shaker offers the convenience of a bench top incubator combined with an orbital shaking mechanism. This unit is ideal for cell and bacterial studies, genetic research and for increasing solubility rates.

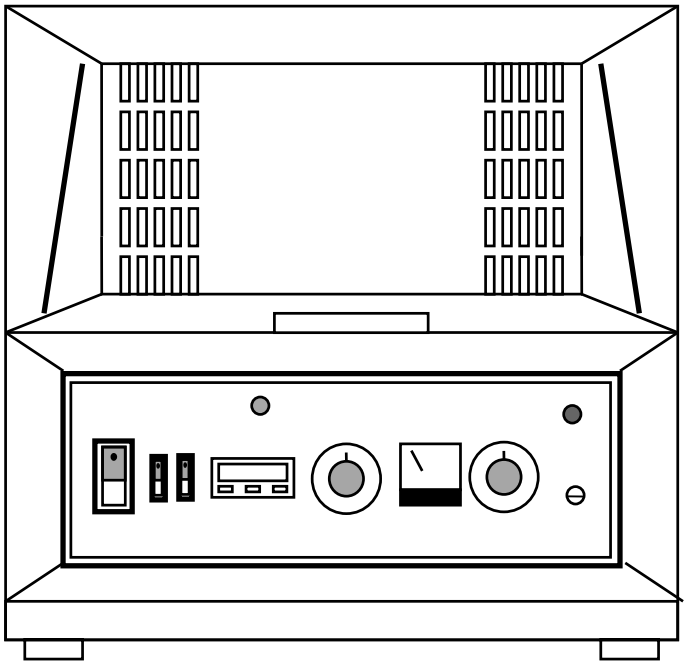
A built-in timer allows continuous shaking or timed shaking for a period of up to 60 minutes. A solid state speed control maintains the shaking speed from 40 to 400 revolutions per minute; however, the maximum safe speed for a load may be less than 400 rpm. Microprocessor control maintains chamber temperature up to 85ºC (3527-5, 3527-5JPN, 3527-6). The clear plastic hood provides unobstructed viewing of samples as they are being shaken in the incubating atmosphere. Temperature can be checked easily on the temperature controllers easy-to-read LCD read out.

Lab-Line offers a wide selection of 18” x 18” (46 x 46cm) shaking platforms and vessel clips to accommodate Erlenmeyer flasks, beakers and test tubes up to a 2 liter capacity.

An optional cooling coil allows below-ambient temperature control in the chamber.

The optional gassing manifold permits gas injection up to a maximum of eight vessels.

A portable light bank is available for photosynthetic studies and experiments.



SECTION 3

SPECIFICATIONS

POWER REQUIREMENTS:	3527: 120 VAC, 50/60 Hz, 600 Watts 3527-1(CE): 240 VAC, 50/60 Hz, 600 Watts 3527-5: 120 VAC, 50/60 Hz, 1200 Watts 3527-5JPN: 100 VAC, 50/60 Hz, 1200 Watts 3527-6: 240 VAC, 50/60 Hz, 1200 Watts
SHAKER MOTION:	3/4-inch circular motion.
SHAKING SPEED:	40—400 rpm.
TEMPERATURE RANGE:	
3527, 3527-1:	Ambient +5ºC to 65ºC
3527-5, 3527-6:	Ambient +5ºC to 85ºC
TEMPERATURE CONTROL:	±0.2ºC (@ 37ºC in flask)
TEMPERATURE UNIFORMITY:	±0.6ºC (@ 37ºC in flask)
TIMER:	1—60 minutes or continuous.
CHAMBER DIMENSIONS:	21"W x 20¾"D x 13¾"H (53 x 53 x 35cm)
OVERALL DIMENSIONS:	22-3/16”W X 29¾”D X 22-5/8”H (56 X 76 X 57cm)
SHIPPING WEIGHT:	235 lbs. (107 kg)
ACCESSORIES:	CC, Cooling Coil GM, Gassing Manifold 4628-40, Light Bank 120V, 60Hz 4628-41, Light Bank, 240V, 50Hz

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:	15ºC to 40ºC
PRODUCT USAGE:	This product is intended for use indoors **only**

SECTION 4

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 unit where it will be operated. Whenever possible select a level surface which is away from drafts and wide variations in ambient temperature and near a power source that matches the requirements shown on the unit's nameplate. Allow clearance around the unit for free air convection, accessory attachment and user convenience.

If the optional gassing manifold or cooling coil was ordered, make sure that a gas supply source and/or coolant (tap water or other) system is within reach.

PLATFORM INSTALLATION:

Select the platform that accommodates the vessels to be shaken. Attach the platform on the shaking plate by inserting and tightening the four button head screws using an Allen key or knurled thumbscrews depending on platform being used. Make sure that all four sides of the platform are outside the shaking plate.

CAUTION: DO NOT PLACE PLATFORM MOUNTING SCREWS IN SHAKING PLATE CORNERS WITHOUT FIRST INSTALLING PLATFORM—SERIOUS DAMAGE MAY RESULT OTHERWISE.

ELECTRICAL CONNECTION:

Before making the electrical connection, double-check to be sure that the outlet is properly grounded and that it matches the power requirements of the equipment, as listed on the unit's nameplate.

If a plug must be installed, make certain that the green ground wire of the power cord is secured to the plug ground terminal. White is neutral (120 V units) or to line #1 (240 V units) and the black wire is hot (120 V units) or to line #1 (240 V units).

INSTALLATION: (Con't)

OPTIONAL COOLING COIL:

Connect 3/8" (9.5mm) ID tubing to the ports marked "IN", "OUT" and "DRAIN". Run tubing from the "IN" port to the coolant circulation and from the "OUT" port to the coolant reservoir. Condensation from the incubator chamber will drain from the port marked "DRAIN." Run tubing from this port to a floor drain or container.

OPTIONAL GASSING MANIFOLD:

For older style shakers, use the following instructions:

Connect 1/4" (6.4mm) ID tubing to the gas inlet port on the right side of the unit, near the rear. Connect the other end of the tubing to the flow regulator on the gas tank. Use only non-corrosive, nonflammable inert gases. Connect 1/4" (6.4mm) ID tubing to eight hose barbs inside the chamber along the back. Run the tubing into the vessels.

Gassing manifolds for new style shakers are installed as follows:

- Securely fasten the manifold to the cover with the furnished 8-32 x 5/8 tapping screws, #8 flat washers, #8 lock washers and #8-32 hex nuts.
- Attach flexible tubing to the barbed fitting on the manifold and, allowing sufficient length for movement, cut and attach tubing to the gas source regulator.

OPTIONAL LIGHT BANK:

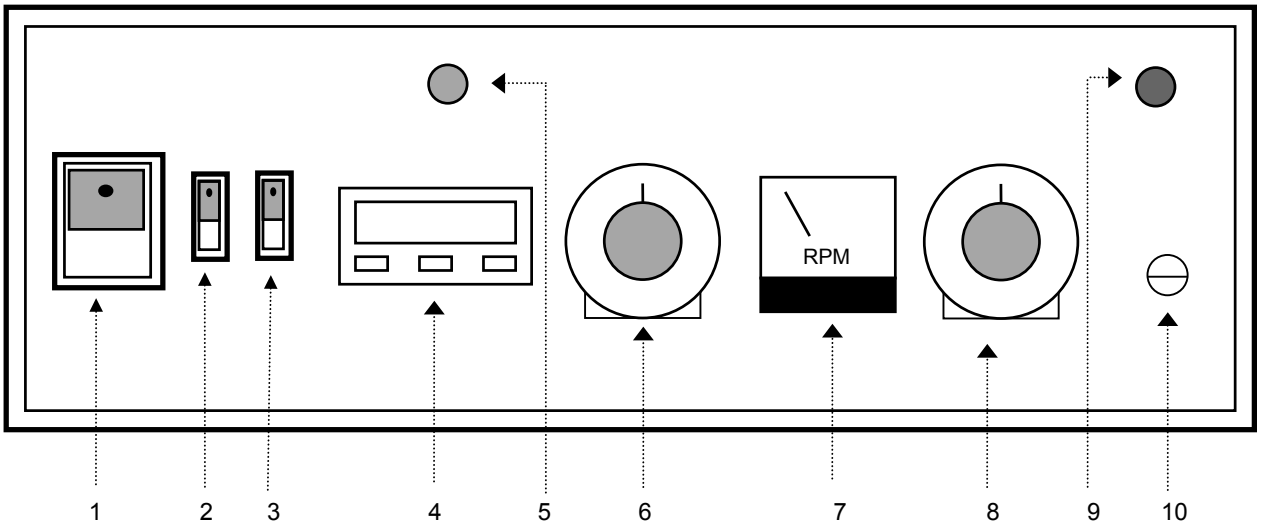
Unpack the light bank carefully. Note that the supports and hardware are separate from the main unit. Install the 4 supports at the corners of the light bank with the Phillips screws supplied. The light bank will stand on the 4 supports.

Plug Model 4628-40 into a 120 VAC, 60 Hz grounded outlet and turn the light switch to **ON**. Model 4628-41 plugs into a 240 VAC, 50 Hz grounded outlet. If the fluorescent tubes do not light, remove the screen tabs to open the screen, then turn the tubes in their fixtures. The tubes may have loosened during shipping. If the tubes still do not light, contact your Lab-Line dealer to resolve the problem.

SECTION 5

FEATURES

CONTROL PANEL



1. POWER SWITCH: A 2-position switch that turns on power to the unit.

2. HEATER SWITCH: A 2-position switch which activates heaters; however, blower fan must be switched on before heating can occur.

3. BLOWER SWITCH: A 2-position switch that controls blower fan. If controlled heating will be used, blower must be operating.

4. TEMPERATURE CONTROLLER: Microprocessor based temperature controller with LCD temperature read out. Use arrow UP key to increase temperature and arrow DOWN key to decrease temperature.

5. CONTROL STATUS LAMP (amber): Indicates when set point temperature has been reached by blinking at a steady rate.

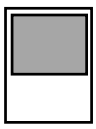
6. SPEED CONTROL: The control knob sets shaker speed. KBDM-14BT (1268C)

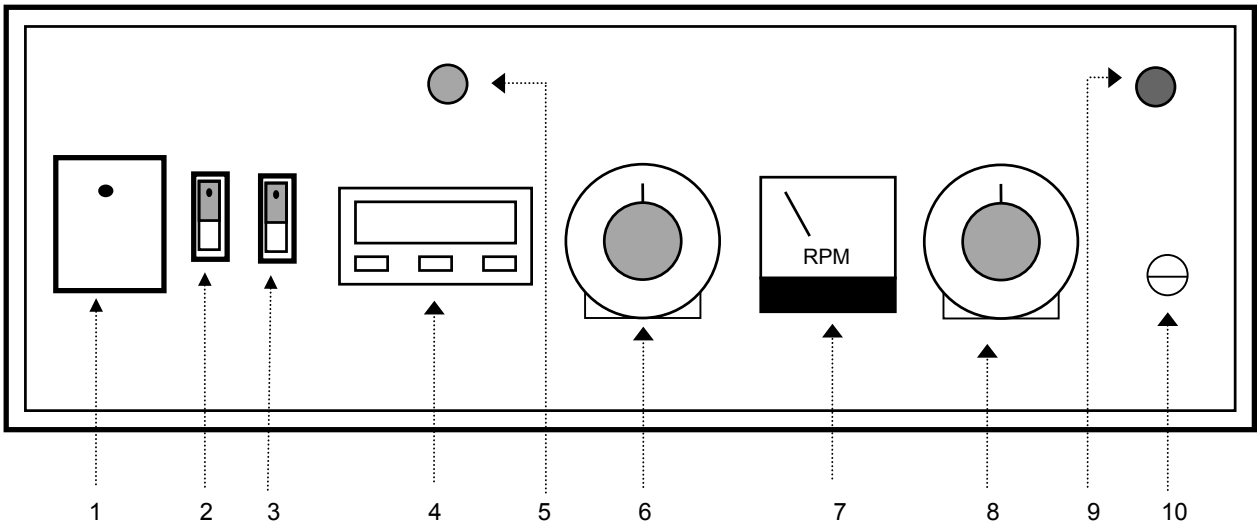
7. TACHOMETER (ANALOG SPEED READOUT): Displays reading of shaking speed in revolutions per minute.

   -shows a representation of the voltage applied to the motor from the speed control, and not an actual motor speed feedback.

FEATURES: (Con't)

CONTROL PANEL





8. TIMER: The control can be used to set a timed shaking cycle from 1 to 60 minutes or to run continuously.

9. HI-LIMIT STATUS LAMP (red): Indicates when hi-limit temperature has been reached.

   CIRCUIT BREAKER (not shown located on the back of the unit): In the event of power overload, circuit breaker button pops up. To re-set, press button back in until it clicks in place.

10. HI-LIMIT THERMOSTAT: Set by turning with screwdriver clockwise a few degrees above set point. This will maintain set point temperature in the event of primary control failure.

SECTION 6

OPERATION

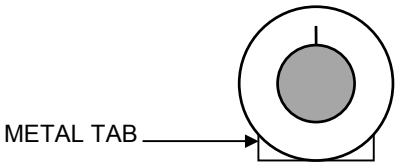
DANGER: DO NOT USE IN THE PRESENCE OF FLAMMABLE OR COMBUSTIBLE MATERIALS OR EXPLOSIVE GASES. FIRE OR EXPLOSION MAY RESULT CAUSING DEATH OR SEVERE INJURY

CAUTION: TO PREVENT DAMAGE TO SPECIMENS, BEGIN USE WITH AN EMPTY CHAMBER. THE UNIT IS EASILY LOADED AFTER TEMPERATURE AND SPEED CONTROLS ARE CORRECTLY ADJUSTED.

The Bench Top Environmental Shakers can be used as a standard shaker (without heating); as an environment chamber (without shaking); or with both heating and shaking action.

INITIAL ADJUSTMENT OF CONTROLS:

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



Rotate both knobs—speed control and timer—to their extreme counterclockwise positions before connecting unit to power source. After inserting the plug, press all switches to the unlit **OFF** positions; then turn on power switch. It will light to indicate that power is **ON**.

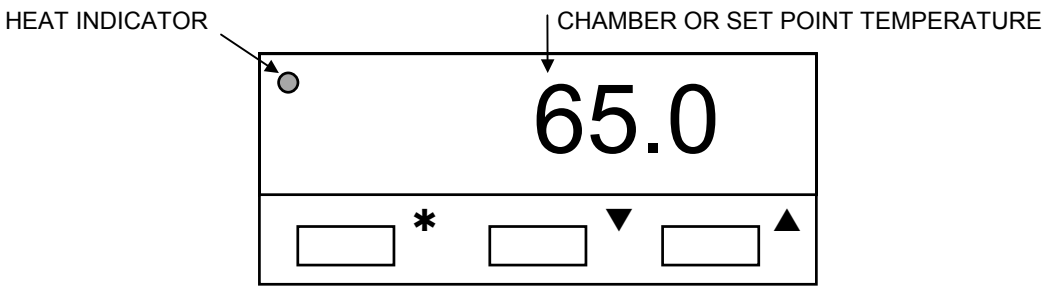
OPERATION: (Con't)

HOW TO INITIATE HEATING:

If controlled heating will be used, press the blower switch to start the blower—it must be running for the heater to operate. The blower switch indicates white when it is operating. Note that opening the cover stops only the shaking action; blower and heater remain on.

- Press the heater switch to **ON** and turn hi-limit set screw fully clockwise to activate the heater. The 3 switches and either the control status lamp (amber) or the hi-limit status lamp (red) will be lit.

TEMPERATURE CONTROLLER:



1. CONTROLLER SELF-TEST: When the incubator is powered up the controller will display **8888** along with the three decimal points and the heat **ON** indicator lamp. The display will then blank out for 2 seconds before showing the chamber temperature.

2. HEAT **ON** INDICATOR: The heat **ON** indicator lamp is lit when the chamber heater is receiving power. The lamp will normally flash when the chamber temperature is at set point.

3. SETPOINT ADJUSTMENTS: The temperature controller normally displays the chamber temperature. To view or change the temperature set point proceed as follows:

PRESS	CONTROLLER
*	View set point
* ▼	Decrease set point
* ▲	Increase set point

A. Press and hold the star key and use either the up or down arrow key to adjust the set point to the desired temperature. Release the star key.
B. Allow at least 30 minutes for the chamber temperature to stabilize.

OPERATION: (Con't)

TEMPERATURE CONTROLLER: (Con't)

AUTO TUNE:

The auto tune program automatically adjusts the controller parameters to achieve optimal temperature control.

It is not necessary to run the auto tune program when setting up the incubator. However, if the temperature appears to be unstable, the auto tune program can be run using the procedure shown below:

FOR BEST RESULTS:

- Set the usual set point temperature and use normal load conditions.
- Allow the incubator to stabilize at set point for at least 30 minutes.

AUTOTUNING PROCEDURE:

A. Enter the program mode by pressing and holding BOTH the up and down arrow keys for 3 seconds.

B. Release BOTH arrow keys when **tunE** is displayed.

C. The controller display should now be alternating between **tunE** and **oFF.**

D. Press and hold the "**STAR**" (✱) key. Press and release the up arrow key until **At.SP** is displayed. Release the "**STAR**" (✱) key.

E. After one minute has elapsed, the controller display will begin to alternate between showing the **chamber temperature**, **tunE** and **At.SP**.

F. Allow the program to run until the display again shows only the chamber temperature.

OPERATION: (Con't)

TEMPERATURE CONTROLLER: (Con't)

TEMPERATURE CALIBRATION:

A. Install a calibrated thermometer inside a standard glass flask. Install the flask onto the platform. Close the lid.

B. Press and hold the **"STAR"** (✱) key and using the up or down arrow key, adjust the set point to the desired temperature.

C. Allow the unit to run for at least 30 minutes.

D. The controller display should now be indicating the set point temperature. Make note of the thermometer reading.

E. Press and hold both arrow keys until the controller display indicates **tunE**. Release the arrow keys. Press and release the down arrow key, the display should now indicate **LEUL**. Press and hold the **"STAR"** (✱) key and using the up arrow key adjust the display to read **3**. Release the **"STAR"** (✱) key. Press and release the up arrow key until the display indicates **Zero**. The display should now alternate between **Zero** and a numerical value.

F. Using the examples shown below and the thermocouple value obtained in step above, enter the correct **Zero** value into the controller by pressing the **"STAR"** (✱) key and using the up or down arrow keys. If there is already a **Zero** value present then add the new value to the one already present.

Thermometer	=	60 °C	Thermometer	=	70 °C
Controller Reading	=	65 °C	Controller Reading	=	65 °C
Subtract	=	-5 °C	Subtract	=	+5 °C
Enter **Zero** value of -5 °C			Enter **Zero** value of +5 °C		

G. When the correct **Zero** value has been entered, press and hold the two arrow keys together until the display again indicates the chamber temperature. If the procedure was done correctly, the controller display should now agree with the thermometer reading to within ±0.5ºC.

H. Allow the unit to run for at least 30 minutes.

I. Re-check the thermometer reading, the controller display and the thermometer should agree to within ±0.5ºC. If not repeat steps D, E and F above.

OPERATION: (Con't)

SHAKING ACTION:

1. If continuous shaking action is desired, rotate the timer knob to **CONSTANT** position; adjust speed control knob to desired shaking speed.

2. While observing the tachometer, adjust the speed control knob clockwise for more revolutions per minute, counterclockwise for less. Stopping the shaker and loading the platform at this point may help to select the optimum shaking speed. While shaker speed is adjustable higher, for safe operation **DO NOT** exceed recommended maximum of 400 rpm.

3. For timed shaking rotate the timer knob clockwise past **5** and then adjust the speed control knob to set the desired shaking speed. Now, rotate the timer knob to the exact timing period desired—from 1 to 60 minutes.

   For timed periods less than 5 minutes, rotate the timer knob past the 5-minute mark and then carefully turn knob back to the time period desired.

   After the period is timed out, the shaker stops automatically.

NOTE: WHEN THE COVER IS RAISED, THE SHAKER STOPS; HOWEVER, THE BLOWER AND HEATER REMAIN OPERATING. THIS ASSISTS IN MAINTAINING CHAMBER TEMPERATURE AND REDUCES TIME REQUIRED TO REACH SETPOINT IN REPEAT WORK PROTOCOLS.

OPERATION: (Con't)

USING THE OPTIONAL COOLING COIL:

To control chamber temperatures below ambient, use the optional cooling coil with the blower switch and heater switch both **ON**. Run tap water or coolant through the coil. The chamber temperature will drop to as low as 5ºC above the coolant temperature.

USING THE OPTIONAL GASSING MANIFOLD:

The gassing manifold allows the operator to inject an inert gas into the sample vessel(s) while temperature control and shaking continue. Put the ¼" ID tubing from the gassing manifold inlets in the vessels. If more than 8 vessels are used, manifold connectors and additional tubing will accommodate the full number of vessels.

WARNING: TO AVOID POSSIBLE PERSONAL INJURY AND/OR DAMAGE TO THE UNIT, BEFORE INJECTING GAS TO INDIVIDUAL VESSELS, CONSULT WITH YOUR GLASSWARE SUPPLIER TO DETERMINE CORRECT STRENGTH OF VESSEL TO USE FOR THIS OPERATION.

USING THE PORTABLE LIGHT BANK:

Set the temperature and speed selections and load the platform before placing the light bank over the unit. Turn the light bank switch **ON** to power the light bank. To open the cover when using the light bank, the operator must move the light bank to one side first.

OPERATION: (Con't)

OPERATING PNEUMATIC SPRING-CONTROLLED COVER:

CAUTION: DO NOT FORCE COVER OPEN. TO AVOID DAMAGE TO THE CLEAR PLASTIC COVER, EXERCISE CARE WHEN RAISING AND LOWERING IT. TO RAISE COVER, LIFT IT AT THE HANDLE TO A POINT APPROXIMATELY 18" ABOVE THE UNIT. WAIT UNTIL YOU FEEL THE PNEUMATIC SPRING TAKE OVER—IT WILL CONTINUE TO RAISE THE COVER AND THEN HOLD IT OPEN AT AN APPROXIMATELY 80º ANGLE. AN OPENING PRESSURE OF APPROXIMATELY 4 POUNDS IS REQUIRED TO START PNEUMATIC SPRING OPERATION IN THE UPWARD DIRECTION. EXCESSIVE PRESSURE OR FORCE BEYOND 4 POUNDS CAN DAMAGE THE COVER.

CAUTION: DO NOT FORCE COVER TO BEGIN CLOSING MOTION. THE SAME CARE SHOULD BE USED WHEN CLOSING THE COVER. A CLOSING PRESSURE OF APPROXIMATELY 5 POUNDS IS REQUIRED TO START PNEUMATIC SPRING OPERATION IN THE DOWNWARD DIRECTION. BE SURE TO RETAIN CONTROL OF THE HANDLE IN LOWERING THE COVER TO AVOID HAVING IT SLAM CLOSED.

SECTION 7

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 (800) 522-5463 or (563) 556-2241. NO MERCHANDISE, HOWEVER, SHOULD BE RETURNED DIRECTLY TO LAB-LINE WITHOUT PRIOR APPROVAL FROM LAB-LINE.

The Bench Top Incubated Shakers are designed to provide years of dependable service with a minimum of maintenance.

Clean up any spills immediately. Use a damp cloth and a solution of mild soap or detergent to clean interior and exterior surfaces. The platform can be removed and replaced as described previously in the INSTALLATION section.

CAUTION: DO NOT ATTEMPT ANY REPAIR OR SERVICE OF THIS UNIT WITHOUT FIRST REMOVING POWER CORD FROM ELECTRICAL OUTLET.

MOTOR BRUSH INSPECTION AND REPLACEMENT:

If the unit is in continuous use, inspect the shaker motor brushes every 3 months. After removing the plug from its outlet and contents from the platform, carefully lay the unit on its back side—be careful not to damage circuit breakers or coolant tubing protruding from the back of the unit. Remove the bottom screen by removing the feet and screws. Locate the slotted brush caps on opposite sides of the lower part of the motor. Unscrew these spring-loaded caps to draw out the brushes. When brushes are worn down to ½" length, replace them.

BELT REPLACEMENT:

After unplugging the unit and removing platform, remove the platform holder by removing the center screw from each spindle. Lift the platform holder off—this will expose the drive belt. Loosen the motor bracket and reach through the base frame to withdraw the old belt. Feed the replacement belt into position over the motor pulley, then push the other end of the belt onto the large pulley. Re-tighten the motor bracket. Turn the pulley several revolutions to be sure that the belt is in place. No belt adjustment is necessary. Replace the platform holder and screws.

MAINTENANCE: (Con't)

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 4 thumbscrews, remove ribbed mat, remove the 9 smaller screws on the platform mounting plate and then lift it from the unit. Inspect the drive belt for wear and proper tension. Order a replacement if necessary.

- Remove the belt. Take out the 2 large motor mount screws and lift the motor out. 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 brushes when they are worn down to 3/16" in length.

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

- Reattach the motor to the motor mount and install the drive belt. (No belt tension adjustment is necessary.)

  To correct a misaligned pulley, loosen the motor pulley set screw, slide the pulley up or down into alignment then securely tighten the motor pulley set screw.

- Reassemble the unit carefully. Position the platform mounting plate atop the shaker body and turn all 9 screws by hand until they are finger-tight only. Rotate the speed control fully counterclockwise (**OFF**) and plug the unit into an outlet. Rotate the speed control knob slowly in the clockwise direction to allow the shaker to orbit at its slowest speed.

  While it is slowly orbiting, slightly tighten each of the **A** screws illustrated below. Repeat this slightly tightening procedure with the **B** screws, then with the **C** screws.

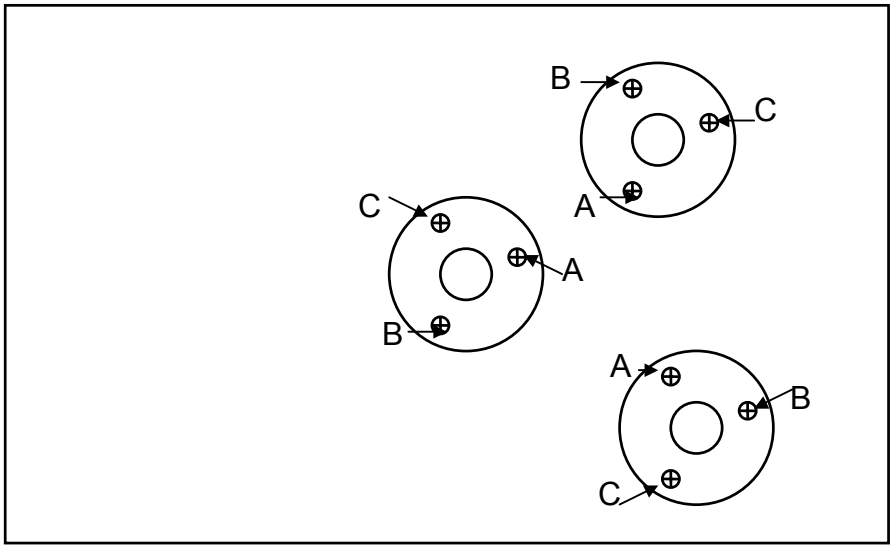
CAUTION: ALL SCREWS MUST FIRST BE SLIGHTLY TIGHTENED TO SEAT THE PLATE PROPERLY.

- Repeat the screw-tightening procedure until all 9 screws are securely tightened.

MAINTENANCE: (Con't)

PREVENTIVE MAINTENANCE: (Con't)

PLATFORM MOUNTING PLATE (TOP VIEW):



3 PHILLIPS SCREWS AT EACH OF 3 BEARING MOUNTS = 9 SCREWS

REPLACING TEMPERATURE CONTROLLER:

1. Place ON/OFF switch in **OFF** position.
2. Unplug shaker from outlet power supply.
3. To remove controller from control housing:
    - use both hands to firmly grip each side of the controller bezel
    - press on the bezel side grips until the bezel tabs release
    - slowly pull controller from housing
4. To install new, factory configured controller:
    - Carefully slide new controller into controller housing.

NOTE: *PCB contacts at rear of controller fit into contacts at rear of controller housing*

- Press controller bezel into controller housing until bezel tabs securely lock controller into place

5. Plug shaker into outlet power supply.
6. Place ON/OFF switch in **ON** position.

REPLACEMENT PARTS

DESCRIPTION	PART NUMBER	
Bearing (for Upper Bearing Housing):	140-130-00	
Bearing (for Shaking Mechanism, 2 each req. per crank assembly, 6 req. per unit):	140-236-00	
Blower:	370-263-00	
Blo-Wheel:	160-141-00	
Capacitor:	310-082-00	
Circuit Breaker, 10 Amp:	330-119-00	
Circuit Breaker, 0.7 Amp:	330-250-00	
Cordset:	470-017-00	
Counterbalance Pulley:	210-105-00	
Drive Belt:	150-291-00	
Felt Disc, 3½" diameter:	530-140-00	
Gas Spring:	850-088-05	
Grommet:	790-123-00	
Heater:	340-304-00	
Motor:	370-344-00	
Motor Brushes (set of 2):	370-255-01	1/4" x 1/4" x 5/8(?)", 3/4" pigtail in spring
Pulley Assembly:	210-090-00	
Relay, 5 AMP:	400-217-00	
Shaker Mechanism:	011-977-00	
Configured Temperature Controller:	485-360-05	
RTD Temperature Sensor:	410-632-00	
Speed Control:	227-598-00	
Status Lamp Lens (safety/red):	360-234-00	
Status Lamp Lens (control/amber):	360-235-00	
Status Lamp Base:	360-233-01	
Proximity Switch:	440-229-00	
Rocker Switch:	440-375-00	

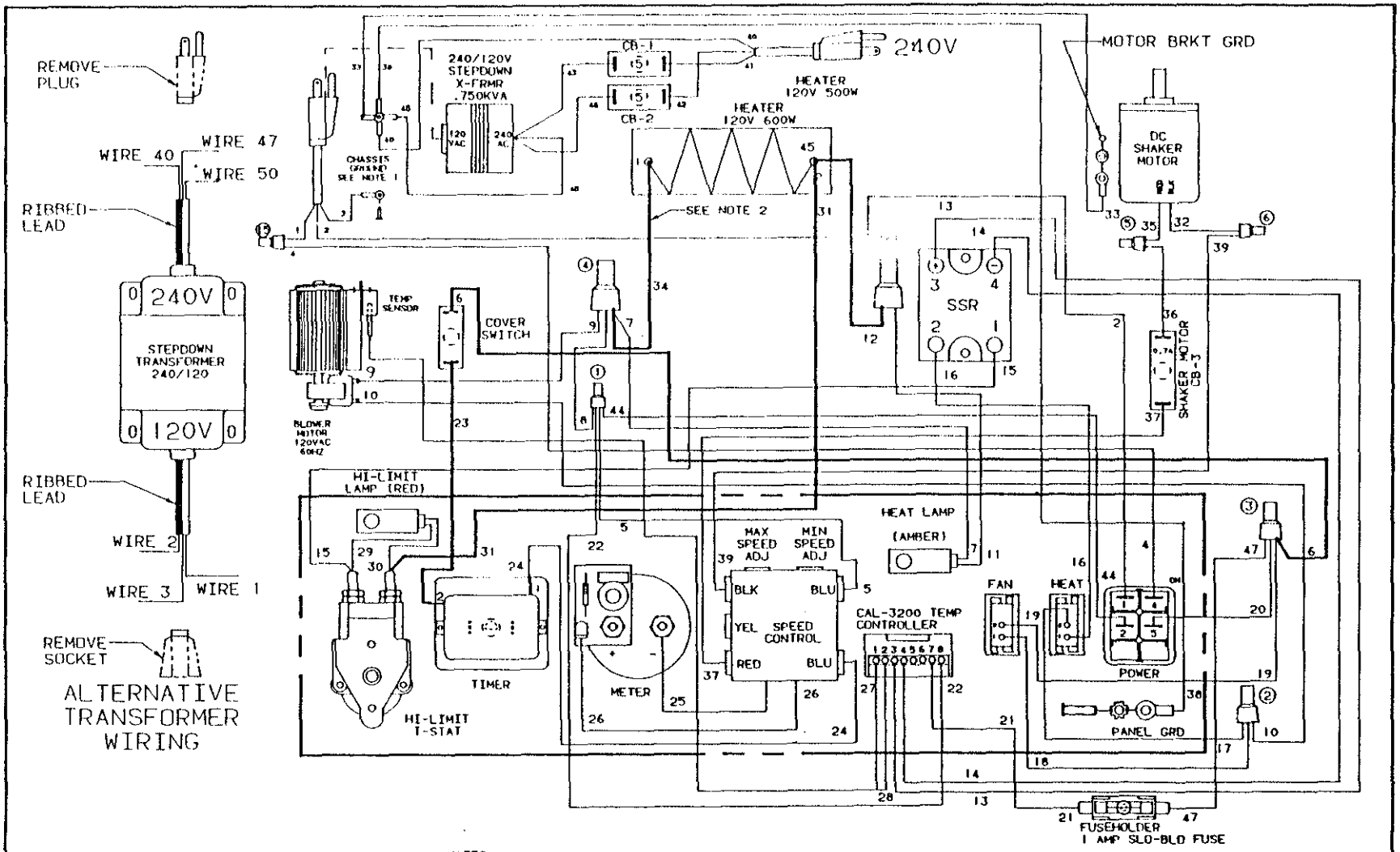
REPLACEMENT PARTS: (Con't)

DESCRIPTION	PART NUMBER
Tachometer:	660-095-00
Tachometer Printed Circuit Board:	227-684-00
Thermostat (safety):	920-301-00
Timer, 60-Minute:	270-109-00
Solid State Relay:	400-233-00
Transformer (only: 240 V):	460-189-00
Tuning Tool:	935-021-00
Upper Bearing Housing Assembly:	011-483-00
Wire Safety Clip (2 required):	500-346-00
Wiring Schematics:	
3527:	C-229-064-00
3527-1:	C-229-065-00
3527-5:	C-228-834-00
3527-5JPN:	C-228-834-00
3527-6:	C-229-069-00
OPTIONAL LIGHT BANK:	4628-40 (120V) 4628-41 (240V)
Cordset:	470-132-00
Fixture:	360-173-00
Fluorescent Lamp:	360-073-00 (also may be purchased locally)
Switch:	440-042-00

NEED A PART? CALL THE LAB-LINE PARTS HOTLINE.
CALL: (800) 522-5463 or (563) 556-2241; FAX: (563) 589-0516.

SECTION 9

WIRING SCHEMATICS



NOTES:
1. LINE CORD GROUNDS MUST BE MOUNTED TO A SEPARATE SCREW AND NOT SHARE ITS MOUNTING LOCATION WITH ANY OTHER GROUND WIRE. EACH GROUND WIRE MUST BE SECURED WITH A SEPARATE NUT.

2. HEAVY LINES INDICATE HI-TEMP 16 GA NICKEL CLAD HEATER WIRE 470-231-00 WITH NICKEL CLAD TERMINALS AT ALL CONNECTIONS. WRAP BARREL OF TERMINALS WITH HI-TEMP GLASS CLOTH TAPE. ROUTE HEATER WIRING AWAY FROM HEATER.

LAB-LINE INSTRUMENTS, INC. 15TH & BLOOMINGDALE / MELROSE PARK, IL 60160		
DESCRIPTION: WIRING DIAGRAM	MATERIAL: AS SHOWN	
DRAWN: RAB	DATE: 29MAY98	CHKD: / APPVD:
MODEL 3527-1	PART / DRAWING NUMBER: C-229-065-00	SHEET 1 OF 2

WARRANTY

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
PHONE: (563) 556-2241 or (800) 522-5463; FAX: (563) 589-0516

WARRANTY

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.

FIRST IN INSTRUMENTS SERVICING SCIENCE, INDUSTRY, RESEARCH 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 NO. S: 3527, 3527-1, 3527-1CE, 3527-5, 3527-5JPN, 3527-6

CHECKED BY: _____

DATE _____

PACKED BY _____

CHECKED	ITEM	PART NUMBER	QUANTITY
_____	Operation Manual	057-149-00	1
_____	Thumb Screw	562-184-10	4
_____	Hex Tool	935-029-00	1
_____	Trimmer Pot Tool	935-021-00	1
_____	Warranty Card	528-022-00	1
_____	Inspection Tag	528-011-00	1