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TECHNOLOGY GROUP

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Find the *Thermo / Lab-Line / Barnstead 4626* at our website: *Click HERE*

8/00

OPERATION MANUAL

MANUAL NO. 056-985-00
REV. NO. D

LAB-LINE®
FORCE ORBITAL BENCH TOP OPEN AIR SHAKERS

MODELS NOs. | 4626
4626JPN
4626-1
4626-1CE

LAB-LINE INSTRUMENTS, INC.
DESIGNERS AND MANUFACTURERS
15th and Bloomingdale Aves. , Melrose Park, IL 60160-1491 USA
PHONE: 708/450-2600 • 1-800/LAB-LINE • FAX: 450-0943

CE

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SECTION 1

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, water, hook-ups, drains 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
708/450-2600 (in Illinois)
1-800/LAB-LINE (elsewhere)

ALL RIGHT RESERVED
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SECTION 2

SAFE OPERATION

BE ADVISED:

THE INSTRUCTIONS ON THIS AND THE FOLLOWING PAGE ARE PROVIDED TO HELP USERS OPERATE THE UNIT SAFELY. FAILURE TO OBSERVE THE PRECAUTIONS COULD CAUSE SEVERE PERSONAL INJURY.

READ OPERATION MANUAL BEFORE USING EQUIPMENT—FAMILIARIZE YOURSELF WITH CONTROLS AND ACCESSORIES.

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

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

DO NOT OPERATE EQUIPMENT IN AN EXPLOSIVE ATMOSPHERE.

DO NOT INSERT FINGERS INTO EQUIPMENT WHEN IT IS OPERATING.

MAKE SURE ALL VESSELS ARE SECURELY CLAMPED BEFORE TURNING ON UNIT. DO NOT OPERATE THE MIXER AT SPEEDS WHICH 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 BUILD UP IN CONTAINER(S) DOES NOT CAUSE THE STOPPER TO BLOW OFF. IF SHAKING ACTION WILL RESULT IN THE EVOLUTION OF GASES OR FUMES, CARRY OUT THE OPERATION IN 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.

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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. SUBSTITUTING OTHER ATTACHMENTS OR ACCESSORIES CAN PRODUCE HAZARDS OR MAKE THE UNIT INOPERATIVE.

DO NOT RUN EQUIPMENT WITH AN UNBALANCED LOAD. ALWAYS LOAD PLATFORMS FOR OPTIMUM STABILITY AND OPERATION.

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.

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 CO_2 ENRICHED ATMOSPHERE.

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SECTION 3

DESCRIPTION

The versatile Force Bench Top Open Air Shaker combines accurate microprocessor control of shaking speed and time with flexible capacity and a compact, space-saving design. The unit is ideal for soluability studies, extraction procedures, diagnostic tests, general mixing, bacterial suspensions, staining, destaining and washing procedures.

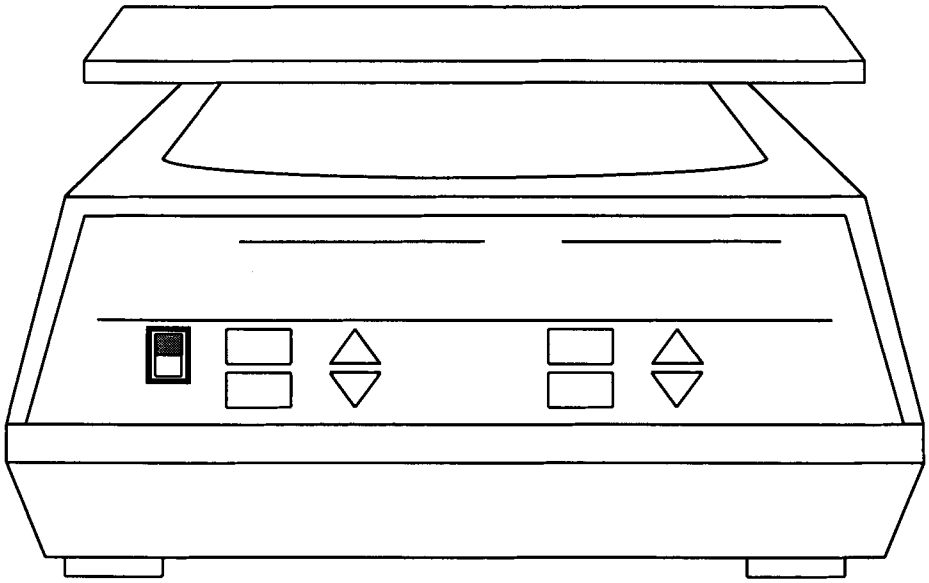
The shaker incorporates a ¾" (1.9cm) orbit with a triple eccentric, counterbalanced drive mechanism to provide uniform, vibration-free shaking at any speed.

Shaker speed range is 15 to 500 rpm; however, maximum safe speed for a load may be less than 500 rpm.

Timing can be selected in intervals of 0.1 to 99.9 minutes or hours. In addition, unit can be set for continuous operation with "time elapsed" indication.

The built-in memory maintains set points and automatically resumes operation after power is interrupted.

The unit accomodates an assortment of platforms in three sizes: 13" x 11" (33 x 28cm), 18" x 18" (46 x 46cm) and 18" x 24" (46 x 61cm).



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SECTION 4

SPECIFICATIONS

ELECTRICAL:	
MODEL 4626:	120 VAC, 50/60 Hz, 100 Watts, 0.8 Amp
Model 4626JPN:	100 VAC, 50/60 Hz, 100 Watts, 1.0 Amp
MODEL 4626-1(CE):	240 VAC, 50/60 Hz, 100 Watts, 0.4 Amp
SHAKER MOTION:	¾-Inch (1.9cm) eccentric
SHAKER SPEED:	15 to 500 rpm
TIMER:	Timer provides timing from 0.1 to 99.9 minutes or 0.1 to 99.9 hours; or continuous operation. Timing can be displayed in two modes: COUNT DOWN: Timing period selected is timed out and final display is 00.0. COUNT UP: Accumulated time from start of shaking operation is displayed either in minutes or hours.
DIMENSIONS:	11½"W x 16½"D x 6½"H (29 x 42 x 17 cm)
NET WEIGHT:	36 lbs. (16 kg)

UNIT'S ENVIRONMENTAL OPERATING CONDITIONS:

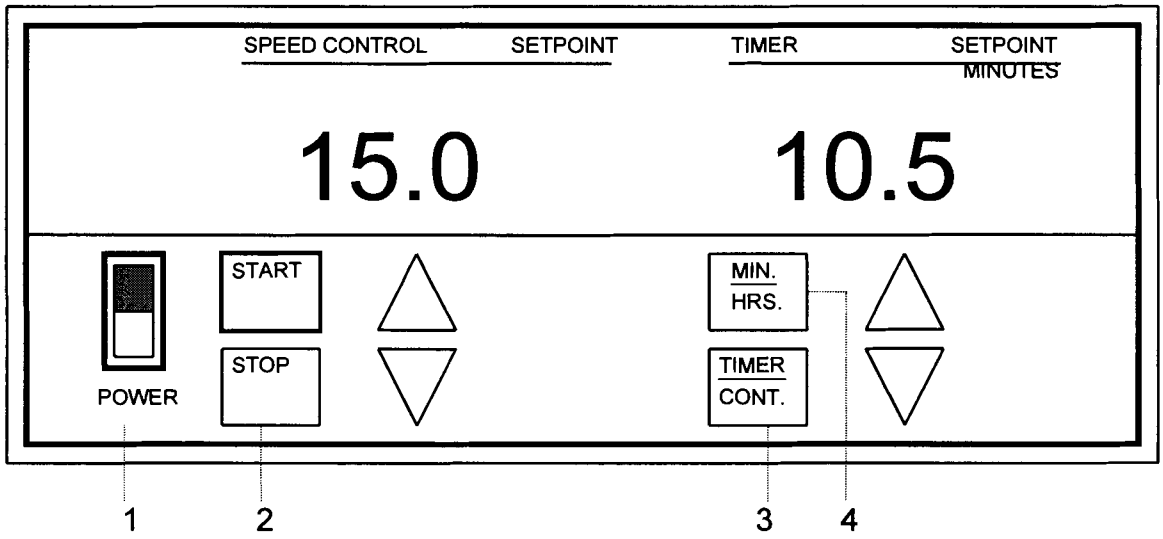
POLLUTION DEGREE:	2
INSTALLATION CATEGORY:	II
ALTITUDE:	2000 Meters MSL (Mean Sea Level)
HUMIDITY:	80% maximum, non-condensing
ELECTRICAL SUPPLY:	120VAC or 240VAC
VOLTAGE TOLERANCE:	±10% of normal rated line
TEMPERATURE:	15°C to 40°C
PRODUCT USAGE:	This product is intended for use indoors **only**

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SECTION 5

FEATURES

CONTROL PANEL:



1. POWER SWITCH: A 2-position switch turns power **ON** to the entire unit.

2. SPEED CONTROL MODULE: Allows user to start and stop shaking action, as well as setting the shaking speed in rpm. LED displays the speed in rpm.

   In the event that shaking action, for any reason, should exceed the set-point by 125%, an overspeed legend appears in this module and the shaker is stopped.

3. TIMER MODULE: Allows user to select between timing in minutes or hours or to operate the shaker continuously. LED shows initial setpoint and elapsing time.

4. TEMPERATURE MODULE: Allows user to select operating temperature setpoint which is displayed on the LED.

   A hi-limit legend is displayed to indicate overtemperature limit has been exceeded.

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SECTION 6

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.

PLATFORM INSTALLATION:

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

ELECTRICAL CONNECTION:

The unit is supplied with a 3-wire line cord and should be connected to an outlet designed for 3-prong plugs. If an extension cord is used, it also should be the 3-wire grounded type (AWG No. 16).

NOTE: WHERE IT BECOMES NECESSARY TO MAKE CHANGES IN ELECTRICAL OUTLETS, WIRING AND OTHER CHARACTERISTICS, IT IS RECOMMENDED THAT THESE BE DONE ONLY BY A QUALIFIED OR JOURNEYMAN ELECTRICIAN. THIS INCLUDES REPLACING 2-PRONG PLUGS (UNGROUNDED), FOR EXAMPLE, WITH A 3-PRONG PLUG (GROUNDED). ALL CHANGES NEED TO BE MADE TO MATCH THE LOAD REQUIREMENTS SHOWN ON THE NAMEPLATE OF THE UNIT.

NOTE: IT IS BEST TO LEAVE UNIT DISCONNECTED WHEN NOT IN USE.

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SECTION 7

OPERATION

BE ADVISED:

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

POWER ON/OFF SWITCH:

After following instructions in Installation section and being certain that the unit is connected to a power source meeting the designation on the nameplate, use Power switch to turn on the unit. The speed control and timer modules on the control panel will illuminate.

SPEED CONTROL:

This module provides a 3-digit readout of the speed of rotation up to a maximum rpm of 500. Use the up and down buttons to set the desired shaking speed.

The start button will initiate the shaking action; however, do not use until all containers have been secured in place on the platform and have been stoppered, if necessary. It is recommended that shaking action be started at less than the required speed, in order to check that all containers are secure, not contacting each other and that no spilling of contents can occur.

If, for any reason, the unit exceeds the set speed by 125%, an overspeed legend appears in this module and shuts the shaker down.

The speed setpoint may be altered at any time during the operation.

TIMER:

The timer module allows 3 selections: (1) timing of the shaking action up to 99.9 minutes, (2) timing of the shaking action up to 99.9 hours, or (3) shaking operation can be selected as continuous. Use the up and down keys to select the set time.

Selections made will illuminate as a legend in this module.

An LED readout will show the time remaining and stop the shaker when the set time has timed out. (Timer mode only)

The timing interval can be changed at any time during the shaking action. For example, if the original selection is 1.5 minutes and 0.5 minutes have elapsed when a new timing interval of 4.0 minutes is entered, the timer will subtract the 0.5 minutes already elapsed and show 3.5 as remaining.

Conversely, if the original selection is 1.5 minutes and 0.5 minutes have elapsed when a new timing interval of 1.0 minutes is entered, the timer will subtract the 0.5 minutes already elapsed and show 0.5 minutes as remaining.

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OPERATION: (Con't)

TIMER: (Con't)

NOTE: IF THE ACCUMULATED TIME REACHES 99.9, THE SHAKER WILL CONTINUE TO SHAKE AND THE TIMER DISPLAY REMAINS AT 99.9

NOTE: THE SHAKER DOES NOT OPERATE IF THE TIMER IS SET AT 00.0.

STARTING THE SHAKING ACTION:

Once the timing selection has been made, press the start button in the speed control module to initiate the shaking action.

If, for any reason, shaking action needs to be stopped, press the stop button in the speed control module.

AC POWER LOSS:

The operating microprocessor possesses a non-volatile memory.

Upon resumption or recovery from an AC power loss, the following will be noted:

- All readouts will flash until any key is pressed.
- If unit was shaking at the time of power failure, it will resume operation at the speed and timer settings that were entered at the time that AC power failed.
- In the event of a speed sensor problem, the speed readout will display **EEE** and shaking will stop. The unit must be disconnected from power source for a minimum of 3 seconds before being reset. If the problem persists, contact local Lab-Line dealer for assistance.

MICROPROCESSOR LOCK-UP:

In the event that microprocessor lock-up should occur, use the following procedure to solve the problem:

- Disconnect unit from power source. Leave the power switch ON.
- Press both the **SPEED UP** button and the **TIMER DOWN** buttons and HOLD them.
- While continuing to hold the 2 buttons, plug unit back into wall outlet.
- Reset is now accomplished.

Microprocessor lock-up conditions are generally caused by disturbances on the AC line. It would be helpful to install a line filter or conditioner between the AC line and the unit to prevent the situation from occurring again.

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SECTION 8

MAINTENANCE

BE ADVISED:

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 1-800/LAB-LINE (OUTSIDE ILLINOIS) OR AT 708/450-2600 (INSIDE ILLINOIS).

NO MERCHANDISE, HOWEVER, SHOULD BE RETURNED TO LAB-LINE WITHOUT PRIOR WRITTEN APPROVAL FROM LAB-LINE.

CAUTION: DISCONNECT PLUG FROM ELECTRICAL OUTLET BEFORE ATTEMPTING ANY MAINTENANCE OR REPAIR OF THIS UNIT.

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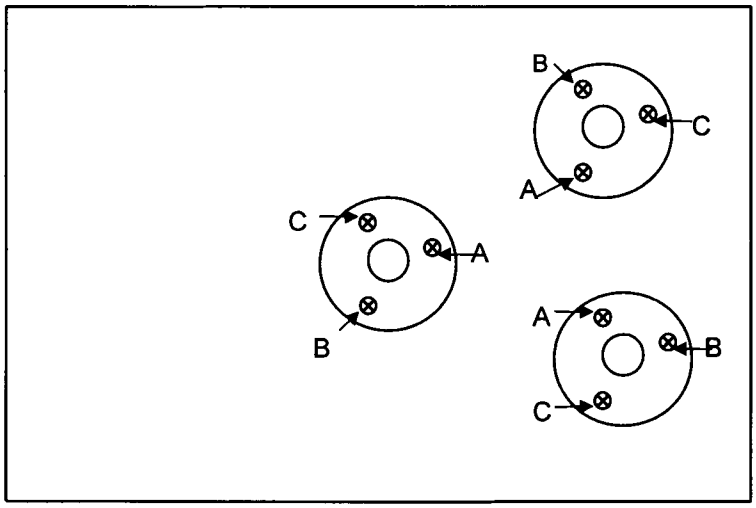
MAINTENANCE: (Con't)

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

NOTE: THE SHAKING MECHANISM IS EQUIPPED WITH GREASE-SEALED BALL BEARINGS WHICH DO NOT REQUIRE FURTHER LUBRICATION OR ADJUSTMENT.

- 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 (see below). Inspect the drive belt for wear and proper tension. Order a replacement if necessary.

PLATFORM MOUNTING PLATE (Top View):



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

- 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.
- Reattach the motor loosely to the motor mount and install the drive belt. To properly tension the belt, slide the motor away from the driven pulley until there is .08" of slack on the belt at midpoint between the pulleys when a force of ¾ lb. is applied. Next, securely tighten the mounting screws.

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

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MAINTENANCE: (Con't)

PREVENTIVE MAINTENANCE (with every 3 months of constant use):(Con't)

- 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. Connect unit to correct power source and adjust the speed to 00.0 setting. From this setting, adjust speed to its slowest possible setting so that shaker is orbiting at its minimum rotation.

  While it is slowly orbiting, slightly tighten each of the **A** screws shown on previous page MN-2. 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.

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SECTION 9

REPLACEMENT PARTS

DESCRIPTION	PART NUMBER
Bearing (for Upper Bearing Housing):	140-130-00
Bearing (for Shaking Mechanism: 2 each reqd. per crank assembly: 6 reqd. per unit):	140-236-00
Circuit Breaker/Switch, 1.0 Amp 330-318-00:	
Control Panel Display Printed Circuit Board:	016-676-00
Cordset, 4626, 4626JPN:	470-262-00
Cordset, 4626-1 (Euro):	470-263-00
Cordset, 4626-1CE (Euro):	470-299-00
Drive Belt:	150-288-00
Housing, Lower:	720-492-00
Housing, Upper:	720-493-00
Mat, Rubber:	790-297-08
Motor:	370-275-00
Motor Brushes (set of 2):	370-272-01
Power Inlet Receptacle:	420-248-00
Pulley, Counterbalance:	150-285-00
Pulley, Drive:	150-287-00
Rotating Sensor Disk:	450-173-01
Rubber Feet (4):	790-078-00
Shaker Drive Printed Circuit Board, 100/120V:	016-677-00
Shaker Drive Printed Circuit Board, 240 V:	017-226-00
Shaking Mechanism:	017-078-00
Speed Sensor Printed Circuit Board:	017-143-00
Switch, Power:	440-365-00
Upper Bearing Housing Assembly (complete):	011-483-00
Schematic, 4626, 4626JPN & 4626-1:	228-260-00
Wiring Schematic, 4626-1CE:	228-798-00

NEED A PART? CALL THE LAB-LINE PARTS HOTLINE.
CALL: 1-800/522-5463; FAX: 1-800/450-4522.

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

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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: (319) 556-2241 or (800) 522-5463; FAX: (319) 589-0516

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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.

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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. 4626, 4626JPN, 4626-1, 4626-1CE

CHECKED BY: _____

DATE _____

PACKED BY _____

CHECKED	ITEM	PART NUMBER	QUANTITY
_____	Operation Manual	056-985-00	1
_____	Thumb Screw	562-184-10	4
_____	Warranty Card	528-020-00	1

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Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

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