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2/00

OPERATION MANUAL

MANUAL NO. 056-986-00
REV. NO. E

LAB-LINE®
THE FORCE DIGITAL BENCH TOP INCUBATED SHAKERS

MODELS NOs.
4628,
4628-1,
4628-1CE,
4628-5JPN

ACCESSORIES:

CC:	COOLING COIL (FACTORY INSTALLED)
GM:	GASSING MANIFOLD (FACTROY INSTALLED)
4628-40:	LIGHT BANK (120V, 60 Hz)
4628-41:	LIGHT BANK (240V, 50)

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

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
(319) 556-2241 or (800) 522-5463

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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 SHAKER 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 SHAKING 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.

SAFE OPERATION: (Con't)

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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.

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DESCRIPTION

The Force Digital Bench Top Incubated Shaker combines microprocessor-based temperature control and timing with variable shaking speed in a controlled environment chamber. The unit is designed for growing and maintaining cultures and microorganisms in ambient air or inert gas environments and is ideal for cell, tissue and bacterial culture studies.

Interchangeable 18” x 18” (46 x 46m) shaking platforms are available which can accommodate a wide range of sizes and numbers of flasks, beakers and test tubes. These are ordered separately to meet specific requirements.

A clear plastic cover allows unobstructed viewing of samples as they are being shaken in the incubating atmosphere. A lid switch turns off the shaker when the cover is raised. Shaking resumes when the cover is closed.

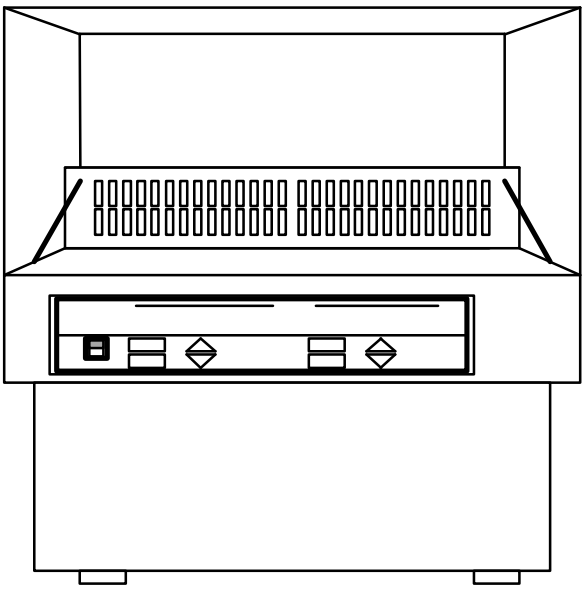
The temperature range is from ambient +5ºC to 60ºC. To protect against overheating, the controlling microprocessor will shut off the heaters in the event the temperature exceeds the setpoint by 2ºC. This is supplemented by an overt-temperature safety system consisting of an independent hydraulic thermostat set by the user at a temperature slightly higher than the setpoint.

Heat control is PID with an RTD temperature sensor. Heated air is circulated in the chamber by a blower positioned in the back plenum.

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.

Optional accessories include a factory installed cooling coil which produces below-ambient temperature control in the chamber, a factory installed gassing manifold which permits gas injection of up to a maximum of 8 vessels and a portable light bank for studies of photosynthesis.



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SPECIFICATIONS

ELECTRICAL:	Model 4628: 120 VAC, 50/60 Hz, 600 Watts Model 4628-1(CE): 240 VAC, 50/60 Hz, 600 Watts Model 4628-5JPN: 100 VAC, 50/60 Hz, 1200 Watts
SHAKER MOTION:	¾-inch (2 cm) rotating motion.
SHAKER SPEED:	15 to 500 rpm; LED displayed. Maximum safe speed for a load may be less than 500 rpm.
TIMER:	Timer provides timing from 0.1 to 99.9 minutes or 0.1 to 99.9 hours; or continuous operation with accumulated time displayed.
TEMPERATURE RANGE:	Ambient +5ºC to +60ºC Ambient +5ºC to +80ºC for 4628-5JPN (under stable ambient conditions) Down to +15ºC above the coolant temperature using the optional cooling coil (with coolant @ +1ºC)
TEMP. CONTROL:	@ 37ºC: ± 0.1ºC (in flask)
TEMP. UNIFORMITY:	@ 37ºC: ±0.5ºC (in flask)
DIMENSIONS:	Overall: 24"W x 28½"D x 22-3/8"H (61 x 72 x 57 cm) Chamber: 21"W x 21"D x 11½"H (53 x 53 x 29 cm) Platform Area: 18"W x 18"D (46 x 46 cm)
NET WEIGHT:	195 lbs. (88 kg)

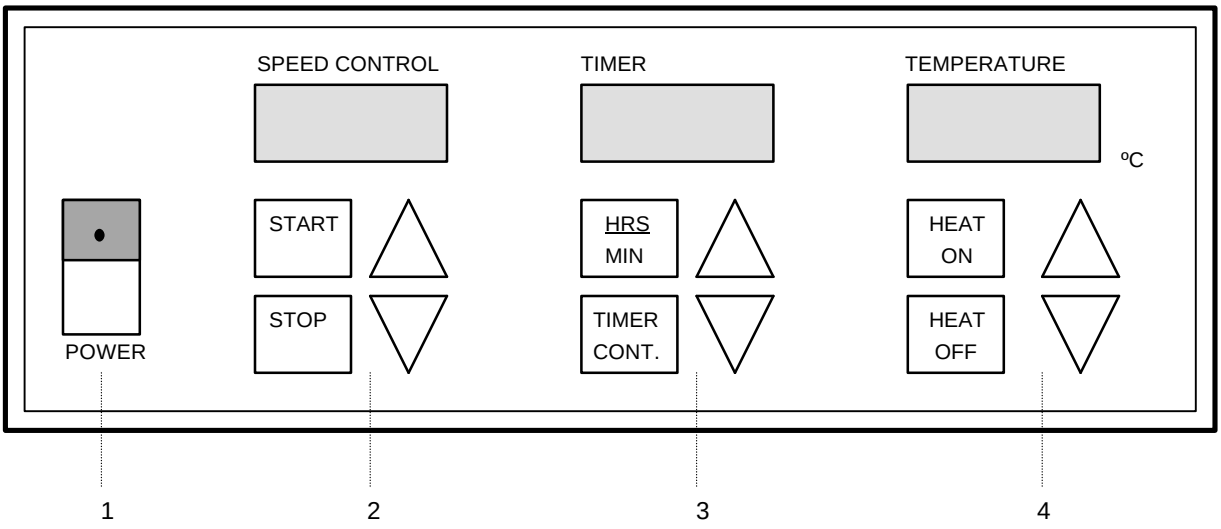
UNIT'S ENVIRONMENTAL OPERATING CONDITIONS:

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

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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 set the shaking speed in **RPM** which is displayed on an LED.

   In the event that the shaking action, for any reason, should exceed the setpoint 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. An LED shows initial setpoint and elapsing time.

4. TEMPERATURE MODULE: Allows user to select operating temperature setpoint which is displayed on an LED: A **HI-LIMIT** legend will display when the over-temperature limit has been exceeded.

FEATURES: (Con't)

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SAFETY THERMOSTAT:

This hydraulic thermostat is a secondary back-up system to protect specimens from excessive heating in the unlikely event of microprocessor failure. It should be set slightly higher than the setpoint temperature. If the temperature should ever reach the setpoint +2ºC, a microprocessor safety will open a relay link to the heaters and shut them off, the hi-limit legend is displayed and beeper alarm sounds.

The hi-limit thermostat can be accessed in the lower right hand corner at bottom front of the unit. Pry off small plastic button to gain access. Use a small blade screwdriver to make the necessary adjustments.

BACK SIDE:

CIRCUIT BREAKERS: Independent pushbutton, reset circuit breakers for line power and shaker motor are next to the power connector. If overloaded, the button pops out. To re-set, push the button in until it clicks in place.

PHONE JACK FOR OPTIONAL RECORDER: A permanent record of chamber temperature may be obtained by connecting a strip-chart recorder or other recording device to the buffered analog output signal. The signal, based on the LED display, is 10 mV per degree-C. A ¼-inch phone jack is on the back of the unit for this purpose.

UNDER THE LID:

INTERLOCK SAFETY SWITCH: When the lid is raised, shaking and blower stop. When closed, the shaker resumes operation. The timing cycle continues to count down with the lid raised or closed.

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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.

CAUTION: DO NOT MODIFY CONSTRUCTION AND/OR ASSEMBLY OF INCUBATOR-SHAKER. DO NOT REMOVE LABELS, DECALS OR OTHER INFORMATION FROM THE INCUBATOR-SHAKER.

LOCATION:

Place the shaker on a level surface in an area which is free of drafts, wide variations in ambient temperature and extraneous vibrations.

ELECTRICAL REQUIREMENTS:

120 VAC models require a 120 VAC, 50/60 Hz power source. They are supplied with a 3-wire line cord. It should be plugged into an outlet designed 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 type.

240 VAC models require a 240 VAC, 50/60 Hz power source. Because of the variety of plug configurations in use worldwide for 240 VAC power, the unit is furnished with the plug removed. The user must install a plug to conform with local code and configuration requirements.

100 VAC models require a 100 VAC, 50/60 Hz power source. Because of the variety of plug configurations in use worldwide for 100 VAC power, the unit is furnished with the plug removed. The user must install a plug to conform with local code and configuration requirements.

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.

NOTE: LEAVE UNIT DISCONNECTED WHEN NOT IN USE.

PLATFORM INSTALLATION:

Select the platform that accommodates the vessels to be shaken. Attach the platform on the shaking plate by inserting and tightening the 4 button-head screws using an Allen key or knurled thumb-screws depending on platform being used. Make sure that all 4 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.

INSTALLATION: (Con't)

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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 noncorrosive, 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 kep 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.

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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.

Using a small flat-blade screwdriver, turn safety thermostat (located in the lower right hand corner of the front of the unit—remove small plastic button to access) to the extreme clockwise position before connecting unit to power supply. Proceed to the next step.

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.

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OPERATION: (Con't)

TIMER: (Con't)

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.

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.

TEMPERATURE CONTROL MODULE:

To set the desired operating temperature, use the Up and Down arrow keys. Once set, temperature control is initiated by pressing the heat on button. The heater will react and start increasing the temperature to reach the setpoint. Temperature controller is PID type.

NOTE: MAXIMUM TEMPERATURE SETTING IS 60ºC.

During operation, both the Up and Down arrow keys can be used to adjust the temperature to a new setpoint.

SAFETY THERMOSTAT:

After the unit has stabilized at the temperature setpoint, turn the safety thermostat counterclockwise until the hi-limit legend comes on. Then turn the safety thermostat clockwise about 5-degrees of rotation.

NOTE: EACH TIME THE UNIT'S TEMPERATURE IS CHANGED, THE SAFETY THERMOSTAT SETTING WILL HAVE TO BE CHANGED. THE UNIT IS DESIGNED FOR TEMPERATURES SLIGHTLY ABOVE AMBIENT TO 60ºC.

DANGER: TO AVOID INJURY FROM BURNS, DO NOT TOUCH OR OTHERWISE CONTACT HEATED SURFACES WHEN UNIT IS OPERATING AT ELEVATED TEMPERATURES

DANGER: DO NOT OPERATE THE UNIT IF ANY OF THE TEMPERATURE CONTROLS BECOME INOPERATIVE—OTHERWISE, A HAZARDOUS CONDITION WILL DEVELOP WHICH CAN RESULT IN INJURY OR DEATH AND PROPERTY DAMAGE.

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OPERATION: (Con't)

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.

USING THE OPTIONAL COOLING COIL:

- Adjust the temperature to the desired temperature.
- Connect the coolant hoses to the cooling coil fittings on the back of the unit. Start the coolant flowing through the cooling coil; flow rate should be at least 6-8 liters per minute. The coolant temperature must be at least 15ºC less than the desired chamber temperature. The coolant flow and temperature must be constant.
- Allow the chamber temperature to stabilize at the setpoint.
- Readjust the safety thermostat per instructions on previous page OP-2 at "Temperature Control Module."
- Lift the cover and load platform. Close lid.

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.

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OPERATION: (Con't)

USING THE OPTIONAL PORTABLE LIGHT BANK:

Load the shaker platform and set the temperature before placing the light bank over the unit. When the chamber has reached the proper temperature and the shaking speed is at the desired level, place the light bank over the chamber. Turn on the switch to light the light bank. The hood cannot be opened when the light bank is in place. To gain access to the chamber, move the light bank to one side and then open the hood.

CAUTION: USE ONLY THOSE ACCESSORIES AND ATTACHMENTS THAT ARE SHIPPED WITH THE UNIT OR ARE SPECIFIED FOR USE WITH THE UNIT. THE SUBSTITUTION OF OTHER ATTACHMENTS OR ACCESSORIES CAN PRODUCE HAZARDS AND/OR RENDER THE UNIT INOPERATIVE.

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 80-DEGREE ANGLE. AN OPENING PRESSURE OF APPROXIMATELY 4 POUNDS IS REQUIRED TO START PNEUMATIC SPRING OPERATION IN THE UPWARD DIRECTION. EXCESSIVE PRESSURE OR FORCE BEYOND THAT 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.

TEMPERATURE CALIBRATION:

Fill a 250-ml Erlenmeyer flask with approximately 100 ml of water and position at the center of the shaking platform. Install a thermocouple inside the flask with the thermocouple junction in direct contact with the water.

Adjust the safety thermostat to its maximum clockwise position. Adjust the setpoint temperature, using the Up and Down keys, to read 37ºC or any other desired setpoint. Allow sufficient time for the temperature to stabilize—1 to 2 hours.

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OPERATION: (Con't)

TEMPERATURE CALIBRATION: (Con't)

To access the temperature calibration mode, use the following procedure:

? Press heat on button and, while continuing to hold, press and release the heat off button. Now, release the heat on button.

The decimal point should now be flashing indicating that the unit is in the temperature calibration mode.

? Use the Up and Down arrow keys to adjust the temperature on LED readout to match the temperature reading on the thermocouple meter.

? Press the heat off button. The beeper will sound indicating that the new, calibration value which you have entered is now stored in the nonvolatile memory of the temperature controller.

NOTE: IT IS IMPORTANT TO PRESS THE HEAT OFF BUTTON TO EXIT THE CALIBRATION MODE.

? Press heat on button to complete return to normal operating mode.

PHONE JACK FOR OPTIONAL RECORDER:

To make a record of the chamber temperature as shown on the LED readout, plug a recording device into the ¼-inch (6 mm) phone jack on the back of the unit. Output voltage is 10 mV per degree-C; output impedance is 1 K-ohm. The recording device should have a minimum input impedance of 10 K-ohm and should be set for a minimum range of 0 to 1 VDC.

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 (319) 556-2241 OR (800) 522-5463. NO MERCHANDISE, HOWEVER, SHOULD BE RETURNED DIRECTLY TO LAB-LINE WITHOUT PRIOR APPROVAL FROM LAB-LINE.

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

CLEANING:

Wash the exterior and interior of the unit with a soft cloth using a solution of mild soap and water, rinse off with clean water and dry thoroughly. This procedure also applies to the acrylic cover.

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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
Blower Motor	370-263-00
Blo-Wheel	160-141-00
Capacitor	310-152-00
Circuit Breaker, 10 Amp	330-119-00
Circuit Breaker, 5 Amp (240V only)	330-118-00
Circuit Breaker, 0.7 Amp	330-250-00
Control Panel Assembly Printed Circuit Board, 120V/240V	016-674-00
Cordset, 4628, 4628-1, 4628-1CE	470-264-00
Cordset, 4628-1CE	470-263-00
Drive Belt	150-283-00
Fan Motor	370-254-00
Felt Disc, 4" diameter	530-140-00
Gas Manifold	014-687-00
Gas Spring	850-106-00
Heat Control Printed Circuit Board, 120V	016-673-00
Heat Control Printed Circuit Board, 240V	017-230-00
Heater, 600 Watt, 240V	340-303-00
Heater, 600 Watt, 120V	340-304-00
Interconnect Cable, 120V/240V	470-280-00
Motor	370-344-00
Motor Brush Set	370-344-01
Pulley, Counterbalance	150-284-00
Pulley, Drive	150-282-00
Recorder Jack	420-018-00
Rotating Sensor Disk	450-173-01
RTD Sensor	410-653-00
Rubber Feet	790-078-00
Shaker Drive Printed Circuit Board, 120V	017-144-00
Shaker Drive Printed Circuit Board, 240V	017-227-00
Shaker Mechanism, less counterbalance pulley	014-804-00
Speed Sensor Assembly Printed Circuit Board, 120V/240V	016-675-00
Switch, Power	440-365-00
Switch, Pushbutton	440-364-00
Thermostat, Control	920-301-00
Thermostat, High Limit	330-256-00
Upper Bearing Housing Assembly (Complete)	011-483-00

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REPLACEMENT PARTS: (Con't)

DESCRIPTION	PART NUMBER	
Wiring Schematic, 4626, 120V	228-296-00	
Wiring Schematic, 4628-1, 240V	228-297-00	
Wiring Schematic, 4628-1CE, 240V	228-799-00	
Cordset	470-132-00	470-132-00
Fixture	360-268-00	360-268-00
Fluorescent Lamp (also may be bought locally)	360-264-00	360-264-00
Switch	440-359-00	440-359-00

OPTIONAL LIGHT BANK:

120 V:	4628-40
240 V:	4628-41

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 CHANGE 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. 4628, 4628-1, 4628-1CE, 4628-5JPN

CHECKED BY: _____

DATE _____

PACKED BY _____

CHECKED	ITEM	PART NUMBER	QUANTITY
_____	Operation Manual	056-986-00	1
_____	Hex Tool	935-029-00	1
_____	Pltfrm. Screws	566-331-16	4
_____	Warranty Card	528-022-00	1

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