



Lab Rotators and Low Cost Orbital Shakers

Model No.

2309, 2309JPN, 2309-1CE, 2309-1CECN

2314, 2314JPN, 2314-1CE, 2314-1CECN

2345, 2345JPN, 2345-1CE, 2345-1CECN

2346, 2346JPN, 2346-1CE, 2346-1CECN

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Safety Information

Alert Signals



Warning

Warnings alert you to a possibility of personal injury.



Caution

Cautions alert you to a possibility of damage to the equipment.



Note

Notes alert you to pertinent facts and conditions.



Hot Surface

Hot surfaces alert you to a possibility of personal injury if you come in contact with a surface during use or for a period of time after use.



Electric Shock

Cautions you to risks of electric shock.

Your Thermo Scientific Lab-Line Lab Rotators and Low Cost Orbital Shakers have been designed with function, reliability, and safety in mind. It is your responsibility to install them in conformance with local electrical codes. For safe operation, please pay attention to the alert signals throughout the manual.

This manual contains important operating and safety information. The user must carefully read and understand the contents of this manual prior to the use of this equipment.

Warnings

To avoid electrical shock, always:

1. Use a properly grounded electrical outlet of correct voltage and current handling capacity.
2. Disconnect from the power supply prior to maintenance and servicing.

To avoid personal injury:

1. Do not use in the presence of flammable or combustible materials — fire or explosion may result. This device contains components which may ignite such materials. Not rated for use in hazardous atmospheres.
2. Use appropriate hand and eye protection when handling hazardous chemicals.
3. Refer servicing to qualified personnel.
4. Do not modify construction and/or assembly of equipment.
5. Do not remove tags, labels, decals, or other information from the unit.
6. Stand clear of equipment when it is operating.
7. If shaking action will result in the evolution of gases or fumes, carry out the operation in a well-ventilated laboratory hood.

Description

The Lab-Line series of Lab Rotators and Low Cost Orbital Shakers are offered in a range of models designed to meet a variety of laboratory procedures such as staining and destaining of gels, immunoassays and extractions where disruption to samples needs to be held to a minimum. The kinds of vessels/containers that can be accommodated include flasks, petri dishes, printed well slides, titer plates, reaction trays, culture plates, flasks and test tube racks. The rotator's white silicone rubber mat has the advantage of aiding the viewing of staining and destaining as well as other procedures that may rely on color changes. The shakers incorporate platforms that accommodate 125 or 250 ml flasks. The slim profile accompanied by a compact width and depth makes these units ideal for the limited surface areas. Construction includes a totally enclosed motor and durable, powder coated cold-rolled steel body construction.

Specifications

Electrical Characteristics:

Models 2309, 2314, 2345, 2346	120 VAC, 50/60 Hz, 0.4 Amps, 50 Watts
Models 2309-1CE, 2314-1CE, 2345-1CE, 2346-1CE 2309-1CECN, 2314-1CECN, 2345-1CECN 2346-1CECN	240 VAC, 50/60 Hz, 0.2 Amps, 50 Watts
Models 2309JPN, 2314JPN, 2345JPN, 2346JPN	100 VAC, 50/60 Hz, 0.5 Amps, 50 Watts

Speed Of Rotation: 40-220 RPM

Rotating Orbit: 3/4-inch (1.9 cm)

Maximum Operating Load: Up to 10 lb. (45 kg)

Timing Interval: From 1-60 mins in 1-min intervals or can be set for continuous shaking action.

Platform Dimension:

Models 2309, 2309JPN, 2309-1CE, 2309-1CECN	9" x 9" (23 cm x 23 cm)
Models 2314, 2314JPN, 2314-1CE, 2314-1CECN	12" x 12" (31 cm x 31 cm)
Models 2345, 2345JPN, 2345-1CE, 2345-1CECN	12.25" x 12.25" (31 x 31 cm)
Models 2346, 2346JPN, 2346-1CE, 2346-1CECN	12.25" x 12.25" (31 x 31 cm)

Shaker Platform Capacity:

Models 2345, 2345JPN, 2345-1CE, 2345-1CECN	13, 125 ml Flasks
Models 2346, 2346JPN, 2346-1CE, 2346-1CECN	9, 250 ml Flasks

Overall Model Dimensions:

Models 2309, 2309JPN, 2309-1CE, 2309-1CECN	10.6" W x 4.4" H x 12.4" D (27 cm x 11 cm x 31 cm)
Models 2314, 2314JPN, 2314-1CE, 2314-1CECN	12.5" W x 4.4" H x 13.6" D (32 cm x 11 cm x 35 cm)
Models 2345, 2345JPN, 2345-1CE, 2345-1CECN	12.25" W x 6.25" H x 13.4" D (31cm x 16cm x 34cm)
Models 2346, 2346JPN, 2346-1CE, 2346-1CECN	12.25" W x 6.25" H x 13.4" D (31cm x 16cm x 34cm)

Shipping Weight:

Models 2309, 2309JPN, 2309-1CE, 2309-1CECN	16 lbs. (7.3 kg)
Models 2314, 2314JPN, 2314-1CE, 2314-1CECN	17 lbs. (7.7 kg)
Models 2345, 2345JPN, 2345-1CE, 2346-1CECN	18 lbs. (8 kg)
Models 2346, 2346JPN, 2346-1CE, 2346-1CECN	18 lbs. (8 kg)

SPECIFICATIONS

Environmental Operating Conditions

Pollution Degree*	2
Installation Category*	II
Altitude	2000 meters MSL (Mean Sea Level)
Relative Humidity	20% to 80% maximum, non-condensing
Electrical Supply	120 VAC or 240 VAC
Voltage Tolerance	+10% of normal rated line
Temperature	0°C to 40°C
Product Usage	This product is intended for use indoors only

*IEC 664-1

Declaration of Conformity

(for CE models only)

We hereby declare under our sole responsibility that this product conforms with the technical requirements of the following standards:

EMC:	EN 61000-3-2	Limits for harmonic current emissions
	EN 61000-3-3	Limits for voltage fluctuations and flicker
	EN 61326-1	Electrical equipment for measurement, control, and laboratory use; Part I: General Requirements
Safety:	EN 61010-1	Safety requirements for electrical equipment for measurement, control, and laboratory use; Part I: General Requirements
	EN 61010-2-051	Part II: Particular requirements for laboratory equipment for mixing and stirring

per the provisions of the Electromagnetic Compatibility Directive 89/336/EEC, as amended by 92/31/EEC and 93/68/EEC, and per the provisions of the Low Voltage Directive 73/23/EEC, as amended by 93/68/EEC.

The authorized representative located within the European Community is:

Thermo Fisher Scientific
419 Sutton Road
Southend On Sea
Essex SS2 5PH
United Kingdom

Copies of the Declaration of Conformity are available upon request.

Unpacking and Installation

**Note**

Position unit so that in case of emergency the plug can be easily and quickly disconnected from the power outlet.

**Note**

Leave the rotator disconnected when not in use.

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 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 properly.

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 on a level surface in a convenient location near a grounded electrical outlet that matches the requirements listed on the nameplate.

Operation



Caution

Do not lift or carry unit by its platform, damage to the platform bearing may result.



Caution

Do not operate unit with an unbalanced load. Platforms should be loaded for optimum stability and operation.



Caution

Do not use in the presence of flammable or combustible materials or explosive gasses.



Caution

Do not use in the presence of pressurized or sealed containers.



Note

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Operating Unit-Control Panel

Located on the control panel are easy-to-operate controls: timer on the left and speed control on the right. These controls also turn unit on and off.

Turn speed control clockwise to increase speed and counterclockwise to reduce the speed.

The timer allows the operator to select either a continuous run position or a timing cycle where the shaking period can be set from approximately 1 minute to 60 minutes.



Timer

Speed Control

Continuous Shaking

Rotate timer counterclockwise to ON and speed control clockwise to increase the shaking speed.

Timed Shaking

The timer is graduated in 5-minute increments to 60 minutes. To start timed shaking, it is first necessary to rotate the timer past the 5-minute setting and then adjust the shaking speed. After shaking motion is started, rotate the timer to any timed interval from 1 minute to 60 minutes. The timer will count down and stop the shaker when time period has elapsed.

Setting Shaking Speed

Adjust the shaking speed to the desired level. The operator should use caution in setting the speed too fast to avoid vessels being jarred loose or knocked over.

Maximum speed is factory set at 220 rpm however, MAXIMUM SAFE SPEED may be somewhat less depending on the particular load.

To stop the shaker, rotate the timer knob counterclockwise to the OFF and the speed control to the 12 o'clock position.

Maintenance

**Note**

Make no attempt to service or repair a Thermo Scientific product under warranty before consulting your distributor. 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 customer service department at 1-800-553-0039. No merchandise, however should be returned without prior approval.

Cleaning Spills

The rotator's platform mat is easily removed for cleaning. In the event of any spills on the surfaces of any unit, carry out appropriate neutralization procedures and/or wash off with a cleaning solution made of warm water and a mild detergent. Rinse off with clean water and dry thoroughly. DO NOT use abrasive cleaners on surfaces.

Drive Motor

Excluding brushes, the drive motors are equipped with permanently lubricated bearings and are basically maintenance-free.

**Warning**

To avoid risk of electric shock, disconnect equipment from power source before performing any maintenance procedure.

Replacement Parts

Description	Part Number
Speed Control	227-841-00
Timer	270-135-00
Knob (2)	560-274-00
Driver Pulley	150-302-00
DC Motor	370-388-00
Motor Brush Set	370-372-01
Bearing Housing Assy	019-810-00
Drive Eccentric Assy	019-677-00
Idler Eccentric Bushing	720-585-00
Driven Pulley	150-303-00
Drive Belt	150-325-00
Wiring Diagram, 120V	229-386-00
Wiring Diagram, 240V	229-387-00
Transformer, 240V	460-242-00
Linecord, 120V	470-132-00
Linecord, CE Certified Units	470-299-00
Line Cord, -CN unit	CRMX9
Circuit Breaker, 1-Amp	330-158-00
Foam Strip Foot (2)	790-438-00
Platform Pad, 9" X 9"	790-371-01
Platform Pad, 12" X 12"	790-371-00

Ordering Procedures

Please refer to the Specification Plate for the complete model number, serial number, and series number when requesting service, replacement parts or in any correspondence concerning this unit.

All parts listed herein may be ordered from the **Thermo Scientific** dealer from whom you purchased this unit or can be obtained promptly from the factory. When service or replacement parts are needed we ask that you check first with your dealer. If the dealer cannot handle your request, then contact our Customer Service Department at 563-556-2241 or 800-553-0039.

Prior to returning any materials, please contact our Customer Service Department for a "Return Materials Authorization" number (RMA). Material returned without an RMA number will be refused.

For the name of the authorized Thermo Scientific product dealer nearest you or any additional information, contact us:

2555 Kerper Blvd., Dubuque, Iowa, 52004-0797
Phone: 563-556-2241 or 1-800-553-0039
Fax: 563-589-0516
Web: www.thermo.com

One Year Limited Warranty

This Thermo Scientific product is warranted to be free of defects in materials and workmanship for one (1) year from the first to occur of (i) the date the product is sold by the manufacturer or (ii) the date the product is purchased by the original retail customer (the "Commencement Date"). Except as expressly stated above, the MANUFACTURER 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 the manufacturer must perform all warranty inspections. In the event of a defect covered by the warranty, we shall, as our sole obligation and exclusive remedy, provide free replacement parts to remedy the defective product. In addition, for products sold within the continental United States or Canada, the manufacturer 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.

The 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 the manufacturer 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 Thermo Scientific products.

Heating elements, because of their susceptibility to overheating and contamination, must be returned to the factory and if, upon inspection, it is concluded that failure is due to factors other than excessive high temperature or contamination, the manufacturer will provide warranty replacement. As a condition to the return of any product, or any constituent part thereof, to the factory, it shall be sent prepaid and a prior written authorization from the manufacturer assigning a Return Materials Number to the product or part shall be obtained.

IN NO EVENT SHALL THE MANUFACTURER 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.

For the name of the authorized Thermo Scientific product dealer nearest you or any additional information, contact us:

North America: USA/Canada +1 866 984 3766 (866-9-THERMO) www.thermo.com

Europe: Austria +43 1 801 40 0, Belgium +32 2 482 30 30, France +33 2 2803 2180, Germany national toll free 08001-536 376,

Germany international +49 6184 90 6940, Italy +39 02 02 95059 434-254-375, Netherlands +31 76 571 4440, Nordic/Baltic countries +358 9 329 100,

Russia/CIS +7 (812) 703 42 15, Spain/Portugal +34 93 223 09 18, Switzerland +41 44 454 12 12, UK/Ireland +44 870 609 9203

Asia: China +86 21 6865 4588 or +86 10 8419 3588, India toll free 1800 22 8374, India +91 22 6716 2200, Japan +81 45 453 9220,

Other Asian countries +852 2885 4613 Countries not listed: +49 6184 90 6940 or +33 2 2803 2180