

## Unit Installation

### **MaxQ 2000**

**Open-Air Platform Shaker**

Installation Guide 7994310 Rev. 0



For further information, refer to the enclosed operating manual on CD. A printed copy of the operating manual is available from Technical Services.

Visit us online to register your warranty  
[www.thermoscientific.com/warranty](http://www.thermoscientific.com/warranty)

**Thermo**  
SCIENTIFIC

Thermo Fisher Scientific  
401 Millcreek Road, Marietta, Ohio 45750  
United States



**Warning** Use the MaxQ High Performance Orbital Shakers to process non-flammable materials only. ▲

**Caution** Grounding circuit continuity is vital for the safe operation of this shaker. Never operate the unit with the grounding conductor disconnected. ▲

**Important** Read this instruction manual. Failure to read, understand and follow the instructions in this manual may result in damage to the unit, injury to operating personnel, and poor equipment performance. ▲

**Caution** All internal adjustments and maintenance must be performed by qualified service personnel. ▲

Material in this manual is for information purposes only. The contents and the product it describes are subject to change without notice. Thermo Fisher Scientific makes no representations or warranties with respect to this manual. In no event shall Thermo be held liable for any damages, direct or incidental, arising out of or related to the use of this manual.

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Important operating and/or maintenance instructions. Read the accompanying text carefully.



Potential electrical hazards. Only qualified persons should perform procedures associated with this symbol.



Equipment being maintained or serviced must be turned off and locked off to prevent possible injury.



Marking of electrical and electronic equipment, which applies to electrical and electronic equipment falling under the Directive 2002/96/EC (WEEE) and the equipment that has been put on the market after 13 August 2005.



This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2002/96/EC. It is marked with the WEEE symbol. Thermo Fisher Scientific has contracted with one or more recycling/disposal companies in each EU Member State European Country, and this product should be disposed of or recycled through them. Further information on Thermo's compliance with this directive, the recyclers in your country and information on Thermo Scientific products will be available at [www.thermofisher.com](http://www.thermofisher.com).

- ✓ Always use the proper protective equipment (clothing, gloves, goggles, etc.)
- ✓ Always dissipate extreme cold or heat and wear protective clothing.
- ✓ Always follow good hygiene practices.
- ✓ Each individual is responsible for his or her own safety.

*All references indicate sections from the enclosed operating manual on CD.*

## Section 1 Safety Information

Your Thermo Scientific MaxQ 2000 Shaker has been designed with function, reliability, and safety in mind. It is your responsibility to install it in conformance with local electrical codes. For safe operation, pay attention to the alert signals (Warnings, Cautions, Notes) 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, perform the operation in a well-ventilated laboratory hood.

8. Use equipment only for 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.
9. Perform regular maintenance service as specified in this manual and keep unit in good repair. Do not operate with known defects.
10. User is to determine optimum load/speed combinations to ensure that shaker operates safely with a balanced load. Normal operation can include the requirements of the type of studies to be performed, i.e. aeration, solubility, mixing, etc. The vessels should be securely clamped before turning on shaker and contain a stopper whenever possible to prevent hazardous substances from being thrown out during shaking action. Shaking action should be set to begin at a slow speed and gradually increased to desired speed.

## Section 2 Unpacking and Installation

The shipping carton 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. ▲

### Unpacking

Use the packing list below when unpacking to verify that the complete unit has been received. Do not discard packing materials until all is accounted for.

The following items are included in the shipment:

Operating Manual - 057-278-00 (7004310)

Mounting Plate Mat- 790-316-11

Thumbscrew Knob- 562-184-10

If any items are missing, contact Technical Services.

### Location

Put the shaker on a level table or bench capable of supporting the weight of the shaker with any accessories while in operation. Place shaker near an electrical outlet that matches the unit nameplate requirements. Allow clearance around the unit for free air convection, accessory attachments and user convenience.

## Electrical Requirements

SHKA2000, SHKE2000, and SHKE2000CO2 require a 120 VAC, 50/60 Hz power source. They are supplied with a 3-wire line cord and 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.

SHKA2000-1CE, SHKE2000-1CE, and SHKE2000CO2-1CE require a 240 VAC, 50/60 Hz power source. Power cords are supplied.

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.



**Warning** Do not operate shaker with a damaged electrical cord. ▲

To eliminate hazard of electrical shock, make sure floor around shaker is dry. In the event of accidental spilling or splashing of liquids, clean up and/or neutralize the spilled liquids before continuing.

Disconnect the shaker from the power source when not in use.

## Platform Installation

1. Select the appropriate platform for the vessels to be shaken. A wide variety of platforms and accessories are available:
  - Dedicated platforms have the maximum number of flask clamps attached for safe operation.
  - Combination platforms allow the user to shake a wide variety of different sized vessels on the same platform.
2. Carefully position the platform horizontally over the shaker's mounting plate, allowing the 4 thumbscrew knobs on the sides of the mounting plate to line up with the corresponding cutouts on the platform's sides.
3. Once the platform is in place over the outside edges of the mounting plate, tighten the 4 thumbscrew knobs to secure platform to the mounting plate.



**Caution** Do not operate shaker with an unbalanced load. Platforms should be loaded for optimum stability and operation. Do not lift shaker by the platform. ▲

## Section 3 General Specifications

| Model No.                                | SHKA2000 (4310)                         | SHKA2000-1CE (4311)                     | SHKE2000 (4314)   | SHKE2000-1CE (4315)   |
|--|---|---|---|---|
| <b>Exterior Unit Dimensions in. (cm)</b> |   |   |   |   |
| Width                                    | 13.5" (34.4 cm)                         | 13.5" (34.4 cm)                         | 13.5" (34.4 cm)   | 13.5" (34.4 cm)   |
| Height                                   | 6.4" (16.3 cm)                          | 6.4" (16.3 cm)                          | 6.4" (16.3 cm)  | 6.4" (16.3 cm)  |
| Length                                   | 17.4" (44.2 cm)                         | 17.4" (44.2 cm)                         | 17.4" (44.2 cm)   | 17.4" (44.2 cm)   |
| Weight lbs (kg)                          | 40 lbs (18.1 kg)                        | 40 lbs (18.1 kg)                        | 40 lbs (18.1 kg)  | 40 lbs (18.1 kg)  |
| <b>Electrical</b>                        |   |   |   |   |
| Volts (AC)                               | 120                                     | 220-240                                 | 120   | 220-240   |
| Amps                                     | 0.6                                     | 0.8                                     | 0.75  | 0.4   |
| Watts                                    | 45                                      | 100                                     | 45  | 45  |
| Freq.                                    | 50/60                                   | 50/60                                   | 50/60   | 50/60   |
| Speed                                    | 40 to 400 rpm, ±10 rpm                  | 40 to 400 rpm, ±10 rpm                  | 15 to 500 rpm, ±1 rpm   | 15 to 500 rpm, ±1 rpm   |
| Timer                                    | Continuous or timed from 1-60 mins.     | Continuous or timed from 1-60 mins.     | Continuous or timed 0.1-999 hours or 0.1-999 min.   | Continuous or timed 0.1-999 hours or 0.1-999 min.   |
| Recorder Output                          | None                                    | None                                    | None  | None  |
| RS232 Interface*                         | None                                    | None                                    | Monitor speed and time with a computer  | Monitor speed and time with a computer  |
| Display                                  | Analog tachometer displays speed in rpm | Analog tachometer displays speed in rpm | 2 individual LED displays indicate time and speed simultaneously. 3 characters height 1/2 inches (1.27 cm)                              | 2 individual LED displays indicate time and speed simultaneously. 3 characters height 1/2 inches (1.27 cm)                              |
| Soft Start Feature                       | None                                    | None                                    | Software algorithms prevent sudden start/stops  | Software algorithms prevent sudden start/stops  |
| Mutable Alarms                           | None                                    | None                                    | Audible portion of the alarm can be silenced for a period of 1hr. without deactivating the actual alarm condition by depressing any key | Audible portion of the alarm can be silenced for a period of 1hr. without deactivating the actual alarm condition by depressing any key |

*\* Interface cables not to exceed 9.8' (3m) in length*

**Section 3**  
General Specifications

| <b>Model No.</b>                         | <b>SHKE2000C02 (4316)</b>   | <b>SHKE2000C02-1CE (4317)</b>   |
|--|---|---|
| <b>Exterior Unit Dimensions in. (cm)</b> |   |   |
| Width                                    | 13.5" (34.4 cm)   | 13.5" (34.4 cm)   |
| Height                                   | 6.4" (16.3 cm)  | 6.4" (16.3 cm)  |
| Length                                   | 17.4" (44.2 cm)   | 17.4" (44.2 cm)   |
| Weight lbs (kg)                          | 40 lbs (18.1 kg)  | 40 lbs (18.1 kg)  |
| <b>Electrical</b>                        |   |   |
| Volts (AC)                               | 120   | 220-240   |
| Amps                                     | 0.75  | 0.4   |
| Watts                                    | 45  | 45  |
| Freq.                                    | 50/60   | 50/60   |
| Speed                                    | 15 to 500 rpm, $\pm 1$ rpm  | 15 to 500 rpm, $\pm 1$ rpm  |
| Timer                                    | Continuous or timed 0.1-999 hours or 0.1-999 min.   | Continuous or timed 0.1-999 hours or 0.1-999 min.   |
| Recorder Output                          | None  | None  |
| RS232 Interface*                         | Monitor speed and time with a computer  | Monitor speed and time with a computer  |
| Display                                  | 2 individual LED displays indicate time and speed simultaneously. 3 characters height 1/2 inches (1.27 cm)                              | 2 individual LED displays indicate time and speed simultaneously. 3 characters height 1/2 inches (1.27 cm)                              |
| Soft Start Feature                       | Software algorithms prevent sudden start/stops  | Software algorithms prevent sudden start/stops  |
| Mutable Alarms                           | Audible portion of the alarm can be silenced for a period of 1hr. without deactivating the actual alarm condition by depressing any key | Audible portion of the alarm can be silenced for a period of 1hr. without deactivating the actual alarm condition by depressing any key |

| <b>Model No.</b> | <b>SHKA2000 (4310)</b> | <b>SHKA2000-1CE (4311)</b> | <b>SHKE2000 (4314)</b>  | <b>SHKE2000-1CE (4315)</b>  | <b>SHKE2000C02 (4316)</b>   | <b>SHKE2000C02-1CE (4317)</b>   |
|------------------|------------------------|----------------------------|---|---|---|---|
| Motor            | Permanent Magnet DC    | Permanent Magnet DC        | Solid State Brushless DC  | Solid State Brushless DC  | Solid State Brushless DC  | Solid State Brushless DC  |
| <b>Alarms</b>    |                        |                            |   |   |   |   |
| Speed            | None                   | None                       | Audible with flashing LED indicates when speed deviates more than 10% of set point  | Audible with flashing LED indicates when speed deviates more than 10% of set point  | Audible with flashing LED indicates when speed deviates more than 10% of set point  | Audible with flashing LED indicates when speed deviates more than 10% of set point  |
| Speed Shut Off   | None                   | None                       | When speed deviates 10% of set point, unit will shut down immediately   | When speed deviates 10% of set point, unit will shut down immediately   | When speed deviates 10% of set point, unit will shut down immediately   | When speed deviates 10% of set point, unit will shut down immediately   |
| Timer            | None                   | None                       | Beeps twice when time has expired. Shaking motion stops   | Beeps twice when time has expired. Shaking motion stops   | Beeps twice when time has expired. Shaking motion stops   | Beeps twice when time has expired. Shaking motion stops   |
| Unbalanced Load  | None                   | None                       | If the unit is running in an unbalanced condition, an alarm will sound and the shaker will stop until the end user corrects the condition. The speed display will flash "bAL" on speed panel LED. | If the unit is running in an unbalanced condition, an alarm will sound and the shaker will stop until the end user corrects the condition. The speed display will flash "bAL" on speed panel LED. | If the unit is running in an unbalanced condition, an alarm will sound and the shaker will stop until the end user corrects the condition. The speed display will flash "bAL" on speed panel LED. | If the unit is running in an unbalanced condition, an alarm will sound and the shaker will stop until the end user corrects the condition. The speed display will flash "bAL" on speed panel LED. |

| <b>Optional Platform Dimensions in. (cm)</b> |                            |
|--|----------------------------|
| <b>Catalog Number</b>                        | <b>L x W</b>               |
| 30100 Universal                              | 13" x 11" (33 x 27.9 cm)   |
| 30110 Universal                              | 18" x 18" (45.7 x 45.7 cm) |
| 30106 Universal                              | 18" x 24" (45.7 x 60.9 cm) |

The Thermo Scientific MaxQ 2000 Series bench top, orbital, open-air shakers are available in one of two control configurations:

- SHKA2000 and SHKA2000-1CE incorporate a mechanical timer for the control of time and speed, adjustable with rotary dials. Analog tachometer displays speed in RPM, verifying accuracy of speed setting.
- SHKE2000 and SHKE2000-1CE control time and speed by a microprocessor controller, adjustable with membrane switches on keypad in one rpm increments. Flashing display indicates power interruption. Pressing any key will clear display. Non-volatile memory maintains speed and time set points in the event of a power interruption. Speed and time set points are automatically reactivated after power is restored.

In addition, both versions offer:

- ¾ inch (1.9 cm) triple eccentric orbital drive
- 6 permanently lubricated ball bearings
- 35 lb (15.9 kg) platform load capacity at safe speeds less than 400 rpm for SHKA2000/SHKA2000-1CE and less than 500 rpm for SHKE2000/SHKE2000-1CE
- UL, cUL and CE certification

**Intended Use**

Orbital shakers are designed to provide increased aeration in a stable temperature environment.

**Unintended Use**

- 1) Not intended for use in Class I or II applications as defined in 21 CFR
- 2) Not intended for mixtures of flammable materials

**Environmental  
Conditions**

Indoor use only  
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

## Declaration of Conformity (CE only)

Thermo Fisher Scientific hereby declares under its 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

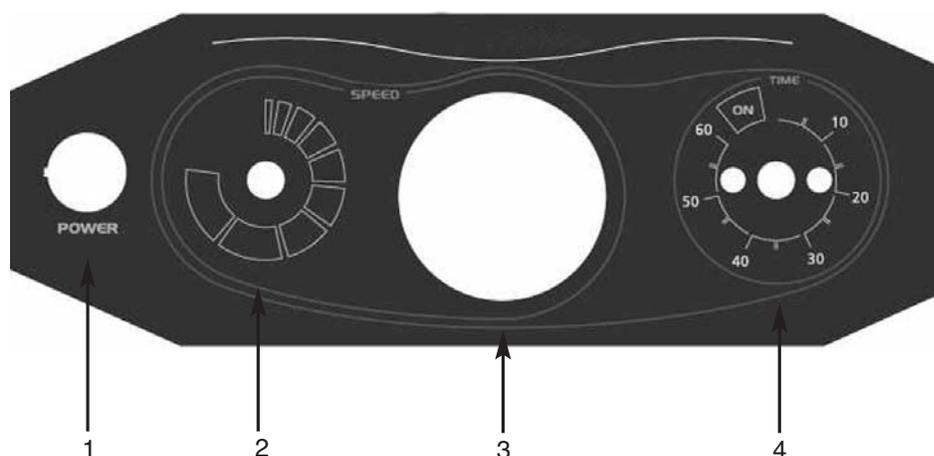
*per the provisions of the Electromagnetic Compatibility Directive 89/336/EEC, as amended by 92/31/EEC and 93/68/EEC, and per the provisions of the Low Voltage Directive 73/23/EEC, as amended by 93/68/EEC.*



**Caution** It is not recommended to operate the shaker in a CO<sub>2</sub> enriched atmosphere. Formation of carbonic acid could cause electrical failures. ▲

## A-Class Control Panel Features

1. Power Switch: Turns power on and off to shaker
2. Speed Control: Sets platform rotation speed
3. Speed Tachometer: Analog display of platform rotation speed
4. Time(r): Allows user to choose either continuous or timed operation



## E-Class Control Panel Features

1. Power Switch: Turns power on and off to shaker
2. Speed Display: 3 digit LED indicates actual or set point speed
3. Up Arrow Key: Increases platform rotation speed
4. Down Arrow Switch: Decreases platform rotation speed
5. Speed Light: Red light Illuminates when a locked rotor or over-speed condition exists
6. RPM Light: Illuminates to indicate actual speed
7. Set RPM Light: Illuminates when speed is being set
8. Stop Switch: Stops platform rotation
9. Start Switch: Starts platform rotation
10. Time(r) Display: 3 digit LED indicates time remaining or elapsed time
11. Up Arrow Key: Increases shaking time
12. Down Arrow Key: Decreases shaking time
13. Elapsed Timer Light: Indicates accumulated time
14. Hours: Timer indicates hours
15. Minutes: Timer indicates minutes
16. Set Time: Illuminates when time is being set
17. Timer/Elapsed: Allows the user to choose elapsed time operation, Elapsed, or timed operation, Timer
18. Hours/Minutes Membrane Switch: Allows user to choose timing operation in either hours or minutes

