



# MaxQ 2000

## Open-Air Platform Shaker

Operating Manual 057-278-00 (7004310) Rev. 13

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<b>Models Covered In This Manual</b>	
<b>Model numbers</b>	<b>Voltage</b>
SHKA2000 (4310)	120V
SHKE2000 (4314)	120V
SHKA2000-1CE (4311)	240V
SHKE2000-1CE (4315)	240V
SHKE2000C02 (4316)	120V
SHKE2000C02-1CE (4317)	240V

**MANUAL NUMBER 057-278-00 (7004310)**

13	41101	8/4/16	Removed the leveling kit note from page 1-2	ccs
12	40139	4/15/15	Updated warranty Information	ccs
11	31361	7/18/14	Removed CE reference on pg 2-4	ccs
10	30954	4/10/14	Updated Setting Timer for Continuous Shaking Step 3 - pg 4-3	ccs
9	30147	7/19/13	Clarified the continuous shaking timer display on pg 4-3	ccs
8	29034	9/10/12	Added note to hyperterminal config information - pg 4-4	ccs
7	28316	3/6/12	Added platform mntg plate replacement instructions to Maintenance section	ccs
6	--	11/1/11	Added missing line to Step 12 on page 4-4 _ lost during transfer	ccs
5	27615	7/22/11	Revised warranty	ccs



**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. ▲

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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.



Hot surface(s) present which may cause burns to unprotected skin, or to materials which may be damaged by elevated temperatures.



WEEE Compliance: Thermo Fisher Scientific has contracted with companies for recycling/disposal in each EU Member State. For further information, send an email to [weee.recycle@thermofisher.com](mailto:weee.recycle@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.

## Do You Need Information or Assistance on Thermo Scientific Products?

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Whatever Thermo Scientific products you need or use, we will be happy to discuss your applications. If you are experiencing technical problems, working together, we will help you locate the problem and, chances are, correct it yourself...over the telephone without a service call.

When more extensive service is necessary, we will assist you with direct factory trained technicians or a qualified service organization for on-the-spot repair. If your service need is covered by the warranty, we will arrange for the unit to be repaired at our expense and to your satisfaction.

Regardless of your needs, our professional telephone technicians are available to assist you Monday through Friday from 8:00 a.m. to 6:00 p.m. Eastern Time. Please contact us by telephone or fax. If you wish to write, our mailing address is:

Thermo Fisher Scientific (Asheville) LLC  
401 Millcreek Road, Box 649  
Marietta, OH 45750

International customers, please contact your local Thermo Scientific distributor.

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# 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. The following stability chart indicates if additional bracing is required.

	<b>10 lbs</b>	<b>20 lbs</b>	<b>30 lbs</b>	<b>40 lbs</b>	<b>50 lbs</b>
<b>100 rpm</b>	No	No	No	No	No
<b>200 rpm</b>	No	No	No	No	No
<b>300 rpm</b>	No	No	No	No	No
<b>325 rpm</b>	No	No	No	No	No
<b>350 rpm</b>	No	No	No	No	No
<b>400 rpm</b>	No	No	No	No	No
<b>450 rpm</b>	No	No	No	Yes	Yes
<b>475 rpm</b>	No	No	No	Yes	Yes
<b>500 rpm</b>	No	No	No	Yes	Yes

## Section 2 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 2**  
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

#### **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**

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

\*\*Refer to IEC 664-1

## 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

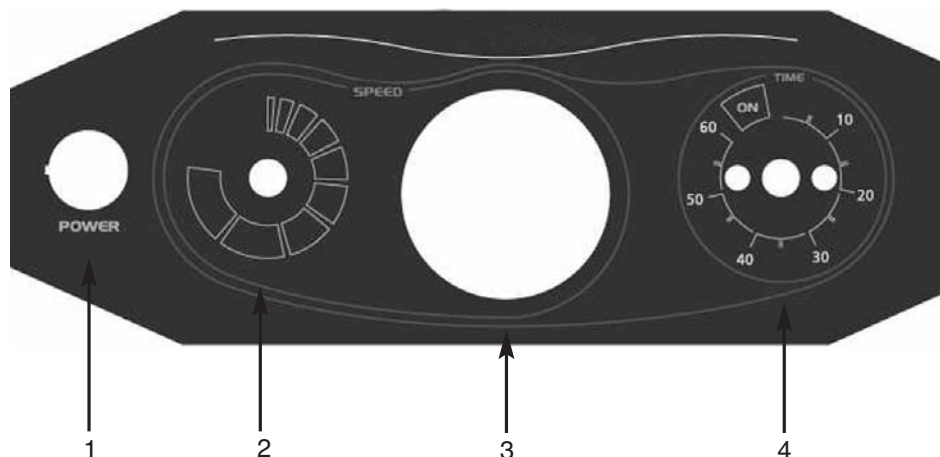
*per the provisions of the Electromagnetic Compatibility Directive 89/336/EEC, as amended by 92/31/EEC and 93/68/EEC, and per the provisions of the Low Voltage Directive 73/23/EEC, as amended by 93/68/EEC.*

*Copies of the Declaration of Conformity are available upon request.*

## A-Class Control Panel Features

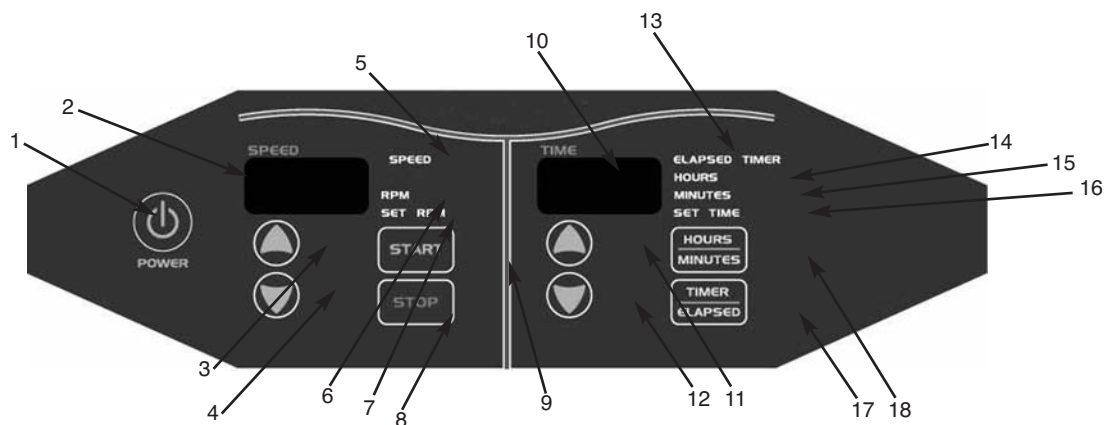
**Caution** It's not recommended to operate shaker in a CO<sub>2</sub> enriched atmosphere. Formation of carbonic acid could cause electrical failures. ▲

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



## Section 3 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

Product Registration Card- 36093

Mounting Plate Mat- 790-316-11

Thumbscrew Knob- 562-184-10

If any items are missing, contact Thermo.

### 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. ▲

## Flask Clamp Installation

1. Carefully place the desired vessel in the clamp by first pulling the clamp spring far enough apart to enable the flask base to be positioned inside the clamp. Gently slide the flask into its proper position, securing it to the wider bottom of the clamp. The spring will hold the neck of the flask securely in place and provide security during shaking.
  - Each flask clamp contains a support spring located at the narrow top of the clamp.
  - Depending on the size of the clamp, the clamp base may contain one or several screws necessary to secure the clamp to the platform. All screws provided with the clamp must be properly attached to the platform.
2. Make sure all vessels are securely clamped before turning on unit.

Wherever possible, vessels should contain a stopper to prevent hazardous substances being thrown out during the mixing action.

**Warning** Do not operate the shaker at speeds that will cause the contents of vessels to be thrown out. ▲

## Test Tube Rack Installation

1. Position the test tube rack on the combination platform so that the cutouts on the rack's outside bottom are aligned with corresponding mounting holes on the platform. There are two cutouts on each side of the rack.
2. Secure the rack to the platform with mounting screws provided with the rack.



## Section 4 Operation

SHKA2000, SHKA2000-1CE

Refer to A-Class Control Panel for reference.

### Power Switch

1. Depress top portion of power switch to turn on shaker.
2. Depress bottom portion of power switch to turn off shaker.

### Speed Control and Display

1. Slowly rotate the knob on the solid-state speed control clockwise to increase speed and counterclockwise to decrease speed. The markings on the outside of the dial are for reference purposes only.
2. The speed control tachometer provides an analog readout of the actual platform rotation speed up to a maximum of 400 rpm.

### Time(r)

1. From the 12 o'clock off position, rotate timer knob counterclockwise to the ON position to initiate continuous operation.
2. For timed operation, rotate timer knob clockwise from 1 minute to 60 minutes. The markings on the side of the dial are in 5-minute increments.

**Caution** It is recommended that shaking action be started at a low speed in order to check that all vessels are secure and that no spilling of contents will occur. ▲

**Warning** Do not use shaker to mix flammable materials or where the transfer of mechanical energy to glass could cause glass breakage. ▲

**Note** Shaker will not operate if the timer is in the Off position.

## SHKE2000 and SHKE2000-1CE

Refer to E-Class Control Panel for reference.

### Turning the Shaker On

Beginning with the shaker power being turned off,

1. Press POWER switch once (I) to turn on shaker.
2. Press POWER switch a second time (O) to turn off shaker.

**Note** There will be a 3 second delay from the time power is turned on to the time the shaker is activated. Control panel will illuminate when shaker power is activated.

### Setting Shaking Speed

1. Hold down appropriate arrow switch in the SPEED module of the control panel, up or down, until desired speed is set to 500 rpm. SET RPM light will illuminate.
2. Press START membrane switch to begin shaking. RPM light will illuminate.
3. Press STOP membrane switch to end shaking. SET RPM light will illuminate.

**Note** Speed can be changed without pressing the start or stop membrane switches. Simply press the appropriate up or down membrane switch until desired rpm is reached.

### Calibrating Shaking Speed

1. Choose a speed for which calibration is desired by using the shaker's UP or DOWN arrow keys.
2. Measure current shaker speed by using a digital hand-held tachometer.
3. If the tachometer reading matches the shaker display, no calibration is necessary. If the tachometer reading is different from the shaker's display, then calibration is required.
4. To get into the calibration mode, hold down the START key, press and release the STOP key, then release the START key.
5. The decimal point on the SPEED display will flash indicating you are in the calibration mode.
6. Use the UP or DOWN arrow keys to set the shaker speed to match the tachometer's readout.
7. Press STOP key to enter the new speed value.
8. Press START key to exit the calibration mode.

## Setting Timer for Timed Shaking

1. Press TIMER/ELAPSED membrane switch until TIMER and SET TIME lights are illuminated. The HOURS or MINUTES light will also light up at this point, depending on which option was previously chosen.
2. Press HOURS/MINUTES membrane switch for desired timing mode.
3. Hold down appropriate arrow membrane switch in the TIME module of the control panel, up or down, until desired timing cycle is set from 0.1 hour up to 999 hours, or from 0.1 minute to 999 minutes, depending on which timing mode is chosen. SET TIME light will illuminate.
4. Press START to begin timed shaking. Countdown will begin from time set. TIMER and MINUTES or HOURS lights will illuminate and timer will count down from time selected. An audible alarm will sound at the end of the timing cycle and platform rotation will cease.

## Setting Timer for Continuous Shaking

1. Press TIMER/ELAPSED membrane switch until ELAPSED light is illuminated. The HOURS or MINUTES light will also light up at this point depending on which option was previously chosen.
2. Press HOURS/MINUTES membrane switch for desired timing mode.
3. TIME display should show '0.0'. Press START to begin timed shaking. Timer will begin to count up and will display accumulated time in display window. Platform rotation will continue until the operator presses the Stop button. The TIME display will flash when ELAPSED time reaches 999 minutes or 999 hours.

## RS232 Interface Port

The RS232 interface port is located on the left side rear of the shaker cabinet and requires the use of a laptop or desktop computer running Microsoft Windows 98 or newer operating system.



RS232 Interface Port

**Note** RS232 Interface Port is for output only. Interface cables must not exceed 9.8' (3m) in length.

## RS-232 Communication Configuration

**Note** The following paragraphs detail the step-by-step procedures for configuring Microsoft® Hyperterminal running on a host computer using Windows® XP. These instructions may need to be modified to be used with a different terminal emulator program and/or operating system. Contact Technical Services if further assistance is required.

1. Power up the host computer and close any running applications.
2. Open the HyperTerminal application by clicking on “Start” \ “Programs” \ “Accessories” \ “Communications” \ “HyperTerminal.”
3. In the “Connection Description” box, enter the name “Max Q Shaker” and choose an icon and click “OK.”
4. In the “Connect To” box, verify that “COM1” is selected under “Connect Using.” Click “OK.”
5. In the “COM1 Properties” box \ “Port Settings” folder select the following options:

Bits per second: .....19200  
Data bits: .....8  
Parity: .....None  
Stop bits: .....1  
Flow control .....None

After verifying the above settings, click “OK.”

6. In the main dialog box click on “File” \ “Save.”
7. Exit the program by clicking on “File” \ “Exit” \ “Yes”.
8. Verify the program was saved by going to “Start” \ “Programs” \ “Accessories” \ “Communications” \ “HyperTerminal” \ “Max Q Shaker.”
9. This completes the configuration of HyperTerminal.
10. Turn shaker off and connect computer (COM 1) to shaker (COM PORT) with DB-9 serial printer cable.
11. Start HyperTerminal by clicking on “Max Q Shaker.”
12. Power up shaker. Shaker will display speed, time and temperature at one minute intervals.

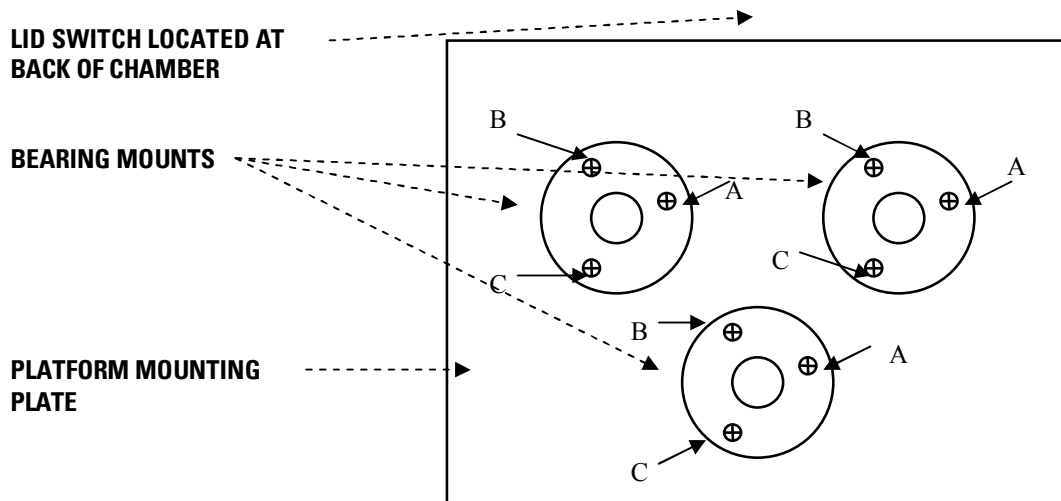
## Section 5 Maintenance

Wash the exterior of the unit with a soft cloth using a solution of mild soap and water, rinse off with clean water and dry thoroughly.

### Replacing Platform Mounting Plate

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

1. Remove the platform by loosening the 4 thumbscrews, remove ribbed mat, remove the 9 smaller screws on the platform mounting plate, there are 3 Phillips screws at each of the 3 bearing mounts.



**Figure 5-1.** Platform Mounting Plate

2. Position the platform mounting plate atop the shaker body and install 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.

**Note** While adjusting the platform retaining screws, make certain lid switch, located at back of chamber, is activated (pressed in).

3. While it is slowly orbiting, slightly tighten each of the A screws in Figure 1. Repeat this procedure by slightly tightening all the B screws, then complete procedure by tightening the C screws.



## Replacing Platform Mntg Plate (cont.)

**Caution** All screws must first be slightly tightened to seat the plate properly. ▲

4. Repeat the screw-tightening procedure at 50-100 RPM until all 9 screws are securely tightened.

## Platform Maintenance

Suggested with every 3 months of constant use

Any internal adjustments or repairs must be performed by a qualified service representative.

Remove the platform by loosening 4 flat head screws in the platform center. Remove the sheet metal panel under the platform to expose the belt and interior parts. Inspect the drive belt for wear and proper tension. Order a replacement if necessary.

### SHKA2000 and SHKA2000-1CE only

1. Take out the 3 large motor mount screws and lift the motor out.
2. 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" (.48 cm) in length.
3. Belt tension is automatically set by the location of the motor and is not adjustable.
4. To align a pulley, loosen the motor pulley set screw, slide the pulley up or down into alignment then securely tighten the motor pulley set screw.

**Note** Make no attempt to service or repair a Thermo product under warranty before consulting your Thermo Fisher Scientific 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, call Technical Services. No merchandise should be returned directly to Thermo without prior approval from Thermo.

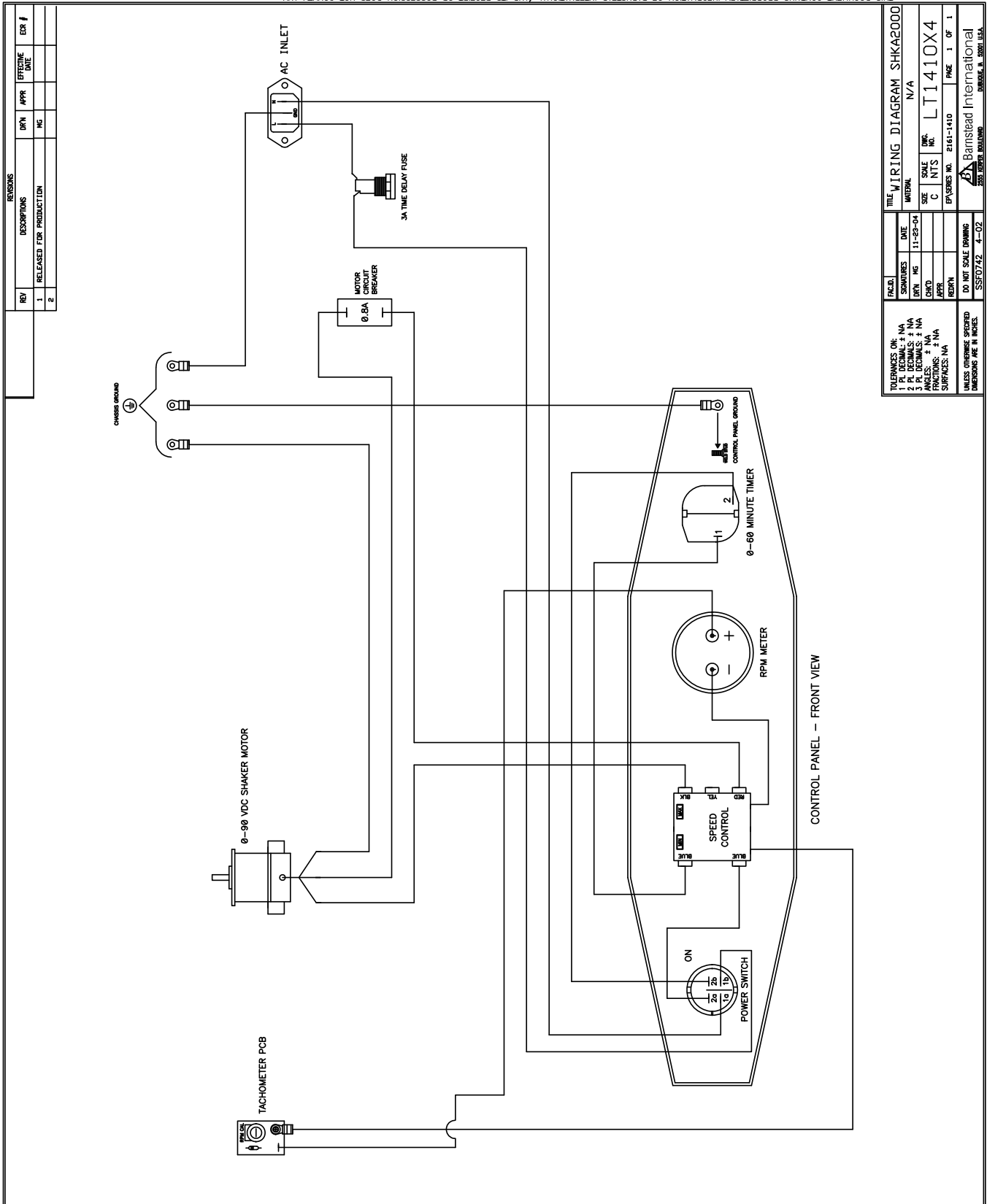
**Warning** Disconnect plug from electrical outlet before attempting any maintenance or repair of this unit. ▲

**Note** The shaking mechanism is equipped with sealed ball bearings which do not require further lubrication or adjustment.

## Section 6 Troubleshooting

Problem	Possible Causes	Solutions
<b>Shaker doesn't operate</b>	Check if power cord is plugged in	Plug in
	Check if power supply matches requirements on data label	Locate the power supply that matches unit requirements
	E-Class, Check fuse	Replace fuse
	E-Class, check for flashing lights on control panel	Press any switch on control panel
	E-Class, check if elapsed timer is flashing	Reset timer
	A-Class, check if timer is in "off" position	Set timer for continuous or timed operation
	A-Class, check if power switch is functioning	Replace if defective
<b>Platform doesn't rotate or has erratic speed</b>	Check for power to motor	Replace motor if defective
	Check drive belt	Replace if worn, broken or slipped off pulley
	A-Class, check for power to speed control	Replace if defective

**Section 6**  
Troubleshooting



REVISES			
REV	DESCRIPTIONS	DATE	BY
1	RELEASED FOR PRODUCTION	11-23-04	ME
2			

FACILITY		DATE		TITLE	
NO.	DESCRIPTION	DATE	TIME	DESCRIPTION	DATE
1	PL. DECIMALS: ± NA	11-23-04		WIRING DIAGRAM SHK2000	N/A
2	PL. DENOMINATORS: ± NA				
3	PL. NUMERATORS: ± NA				
4	ANGLES: ± NA				
5	FRACTIONS: ± NA				
6	SURFACES: ± NA				

DO NOT SCALE DRAWING	SCALE	DATE	NO.	REV.	DATE
SS10742	4-02				

2161-1410	2161-1410	2161-1410
255	255	255

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## Section 7 Replacement Parts

Part No.	Description
150-318-00	Drive Belt, SHKA2000, SHKA2000-1CE
150-288-00	Drive Belt, SHKE2000, SHKE2000-1CE, SHKE2000CO2, SKHKE2000CO2-1CE
227-598-00	Speed Control, SHKA2000
229-419-00	Speed Control, SHKA2000-1CE
228-612-00	Tachometer PCB SHKA2000, SHKA2000-1CE
660-111-00	Tachometer SHKA2000, SHKA2000-1CE
270-135-00	Timer, SHKA2000, SHKA2000-1CE
330-389-00	Fuse, 3 Amp
370-388-00	DC Motor SHKA2000, SHKA2000-1CE
370-390-00	Brushless DC Motor SHKE2000, SHKE2000-1CE
440-396-00	Power switch, Round SHKA2000, SHKA2000-1CE
470-262-00	Line Cord, SHKA2000, SHKE2000, SHKE2000CO2
470-305-00	Line Cord, CE, SHKA2000-1CE, SHKE2000-1CE, SHKE2000CO2-1CE
CRX108	Line Cord, UK, SHKA2000-1CE, SHKE2000-1CE, SHKE2000CO2-1CE
CRX115	Line Cord, China, SHKA2000-1CE, SHKE2000-1CE, SHKE2000CC-1CE
560-274-00	Knob, Speed Control SHKA2000, SHKA2000-1CE
562-184-10	Thumbscrew Knob
790-078-00	Mounting Feet
790-316-11	Mounting Plate Mat
019-445-01	Shaker Mechanism
370-272-01	Motor Brush/Spring Replacement, SHKA2000, SHKA2000-1CE
019-533-02	Main Microprocessor SHKE2000, SHKE2000-1CE
019-534-00	Power/Motor/Drive PCB SHKE2000, SHKE2000-1CE
019-535-00	Display/Time/Speed PCB, SHKE2000, SHKE2000-1CE
019-534-08	Power/Motor/Drive PCB SHKE2000CO2, SHKE2000CO2-1CE
019-535-08	Display/Time/Speed PCB, SHKE2000CO2, SHKE2000CO2-1CE
PC1410X1	Main Microprocessor PCBA, SHKE2000CO2, SHKE2000CO2-1CE
460-315-01	Power Supply SHKE2000CO2, SHKE2000CO2-1CE

## **Ordering Procedures**

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 Fisher Scientific dealer from whom you purchased this unit, or can be obtained promptly from the factory. When service or replacement parts are needed, check first with your dealer. If the dealer cannot process your request, then contact our Technical Services Department.

Prior to returning any materials, contact our Technical Services Department for a “Return Materials Authorization” number (RMA). Material returned without an RMA number will be refused.

## **THERMO FISHER SCIENTIFIC ANALOG SHAKER WARRANTY USA**

The Warranty Period starts two weeks from the date your equipment is shipped from our facility. This allows shipping time so the warranty will go into effect at approximately the same time your equipment is delivered. The warranty protection extends to any subsequent owner during the warranty period.

During the first year, component parts proven to be non-conforming in materials or workmanship will be repaired or replaced at Thermo's expense, labor included. For an additional 4 years, component parts proven to be non-conforming in materials or workmanship will be repaired or replaced at Thermo's expense, labor excluded. In addition, the Orbital Shaker mechanism is warranted for 10 years, parts only, F.O.B. factory. The mechanism is defined as the bearing assemblies. The warranty will be void if the equipment is altered without written authorization from Thermo. Installation and calibration is not covered by this warranty agreement. The Technical Services Department must be contacted for warranty determination and direction prior to performance of any repairs. Expendable items, i.e., glass, filters, light bulbs and lid gaskets are excluded from this warranty. Extended warranties are dependent on the units being maintained regularly as stated in the operation and service manuals.

Replacement or repair of components parts or equipment under this warranty shall not exceed the warranty to either the equipment or to the component part beyond the original warranty period. The Technical Services Department must give prior approval for return of any components or equipment.

**THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER WRITTEN, ORAL, OR IMPLIED. NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL APPLY.** Thermo shall not be liable for any indirect or consequential damages including, without limitation, damages relating to lost profits or loss of products.

Your local Thermo Sales Office is ready to help with comprehensive site preparation information before your equipment arrives. Printed instruction manuals carefully detail equipment installation, operation, and preventive maintenance.

If equipment service is required, please call your Technical Services Department at 1-800-438-4851 (USA and Canada) or 1-740-373-4763. We're ready to answer any questions on equipment warranty, operation, maintenance, service and special applications. Outside the USA, contact your local distributor for warranty information.



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## **THERMO FISHER SCIENTIFIC DIGITAL SHAKER WARRANTY USA**

The Warranty Period starts two weeks from the date your equipment is shipped from our facility. This allows shipping time so the warranty will go into effect at approximately the same time your equipment is delivered. The warranty protection extends to any subsequent owner during the warranty period.

During the first 24 months, component parts proven to be non-conforming in materials or workmanship will be repaired or replaced at Thermo's expense, labor included. For an additional 3 years, component parts proven to be non-conforming in materials or workmanship will be repaired or replaced at Thermo's expense, labor excluded. In addition, the Orbital Shaker mechanism is warranted for 10 years, parts only, F.O.B. factory. The mechanism is defined as the bearing assemblies. The warranty will be void if the equipment is altered without written authorization from Thermo. Installation and calibration is not covered by this warranty agreement. The Technical Services Department must be contacted for warranty determination and direction prior to performance of any repairs. Expendable items, i.e., glass, filters, light bulbs and lid gaskets are excluded from this warranty. Extended warranties are dependent on the units being maintained regularly as stated in the operation and service manuals.

Replacement or repair of components parts or equipment under this warranty shall not exceed the warranty to either the equipment or to the component part beyond the original warranty period. The Technical Services Department must give prior approval for return of any components or equipment.

**THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER WRITTEN, ORAL, OR IMPLIED. NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL APPLY.** Thermo shall not be liable for any indirect or consequential damages including, without limitation, damages relating to lost profits or loss of products.

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## **THERMO FISHER SCIENTIFIC INTERNATIONAL ANALOG SHAKER WARRANTY**

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During the first year, component parts proven to be non-conforming in materials or workmanship will be repaired or replaced at Thermo's expense, including labor. For an additional 4 years, component parts proven to be non-conforming in materials or workmanship will be repaired or replaced at Thermo's expense, excluding labor. In addition, the Orbital Shaker drive mechanism is warranted for 10 years, parts only, F.O.B. factory. The mechanism is defined as the bearing assemblies. The warranty will be void if the equipment is altered without the written authorization from Thermo. Installation and calibration is not covered by this warranty agreement. The local Thermo Fisher Scientific office must be contacted for warranty determination and direction prior to performance of any repairs. Expendable items, i.e., glass, filters, light bulbs and lid gaskets are excluded from this warranty. Extended warranties are dependent on the units being maintained regularly as stated in the operation and service manuals.

Replacement or repair of component parts or equipment under this warranty shall not exceed the warranty to either the equipment or to the component part beyond the original warranty period. The local Thermo Fisher Scientific office must give prior approval for return of any components or equipment.

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## **THERMO FISHER SCIENTIFIC INTERNATIONAL DIGITAL SHAKER WARRANTY**

The Warranty Period starts two months from the date your equipment is shipped from our facility. This allows shipping time so the warranty will go into effect at approximately the same time your equipment is delivered. The warranty protection extends to any subsequent owner during the warranty period.

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