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Revision History

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Chapter 1

Installing and Using the VeraCode Vortex Incubator

Topics

- 2 Introduction
- 7 Installation
- 10 Front Panel Overview
- 11 Basic Operation
- 18 Calibrating Temperature

Introduction

The VeraCode Vortex Incubator is a benchtop shaker and heating chamber for incubating and shaking sensitive samples. It replaces two devices, reducing both the time and the space needed. It is suitable for biochemistry, microbiology, and clinical laboratories in which applications require temperature and shaking treatment.

Key Features

The VeraCode Vortex Incubator has several features, including:

- ▶ Digital display of running parameters allows viewing and setting RPM, temperature, and/or time when the device is running or when it is in standby mode
- ▶ Last used settings are saved in memory after the unit is powered off
- ▶ The precise temperature control system provides for temperature uniformity of $\pm 0.5^{\circ}\text{C}$
- ▶ Over-temperature protection system ensures sample safety
- ▶ Simple user interface; the encoder knob enables rapid adjustment of settings
- ▶ Interchangeable platforms for test tubes and stainless steel microplate platforms
- ▶ High capacity of 56 microtubes or four microplates (or two deep well microplates)

Construction

The housing of the VeraCode Vortex Incubator is constructed of steel plate, coated with highly resistant polyurethane lacquer. The interior chamber is isolated with special thermal protection materials and insulation foam. Both the shaking mechanism and the temperature chamber are regulated via microprocessors, which control all sensors for motor speed, temperature, and time.

Components

The VeraCode Vortex Incubator consists of seven main components:

- ▶ Drive motor
- ▶ Eccentricity control mechanism
- ▶ Chamber fan
- ▶ Heating element
- ▶ Temperature sensor
- ▶ Temperature controlled chamber
- ▶ Control electronics

The drive motor controls the eccentricity control mechanism, which generates the orbital motion of the sample platform.

The motion of the motor also drives the fan, which moves air over the heating element and throughout the temperature chamber. The convection action of the airflow creates a uniform temperature environment throughout the chamber.

Chamber conditions are monitored by the temperature sensor, and the control electronics regulate heater function to maintain the set temperature.

Accessories

The following accessories are available for the VeraCode Vortex Incubator:

- ▶ 1.5/2.0 ml Platform
S2056-R
- ▶ Adapter for 0.5 ml
C1205
- ▶ Adapter for 0.4 ml
C1206
- ▶ Adapter for 0.25 ml
C1222
- ▶ Microplate Platform
S2056-Q

Microtube Platform

The Microtube Platform is intended for shaking 56 1.5/2 ml test tubes. There are adapters available that enable running several different microtube sizes. In addition, the platform and adapters are autoclavable.

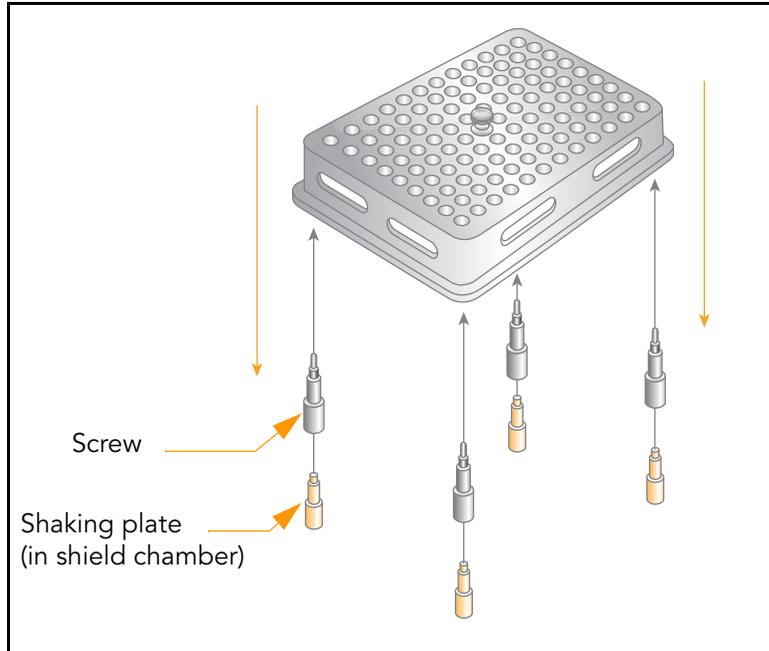


Figure 1 Microtube Platform

Installing the Microtube Platform is a simple process, requiring no special tools. The unit comes pre-assembled with four posts screwed into the shield plate.

1. Grip the microtube platform by the center knob.
2. Align the four rubber grommets with the four posts of the platform.
3. Press down gently.

For processing large sample quantities it is often more convenient to use more than one microtube platform and switch between them.



If you work with temperatures over 50°C, we recommend using special microtubes that are designed for use in thermal cyclers. These tubes are molded from plastic designed to withstand temperatures as high as 135°C. The thin-walled construction also allows for fast heat transfer and reduced heating times.

Microplate Holder Platform



Be careful if the unit has been used to heat samples because the internal components can be extremely hot and can cause burns to uncovered skin. Always check the handle temperature before changing the platform.

The Microplate Holder Platform is designed for shaking up to four microplates or two deep-well microplates. For a more precise temperature controlled environment, we recommend inserting only one microplate on the platform. Additional microplates can have an insulating effect on other plates, especially when stacked.

The working temperature range is +5°C to 45°C. Note that the normal maximum temperature for ordinary microplates is below 60°C. The platform is made of stainless steel and is equipped with springs for keeping microplates secure.

The VeraCode Vortex Incubator comes with the Microtube Platform installed. To install the Microplate Platform:

1. Remove the Microtube Platform.
2. Unscrew all four posts from the outside of the lower platform (see Figure 2).

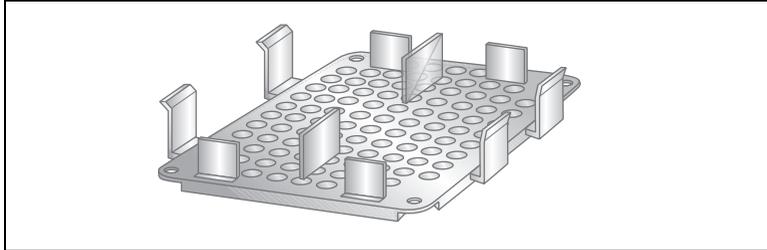


Figure 2 *Installing the Microplate Platform*

3. Attach the Microplate Platform by centering the platform corner holes on the device shield plate (see Figure 3). Ensure the alignment arrows are pointing towards the front of the unit.

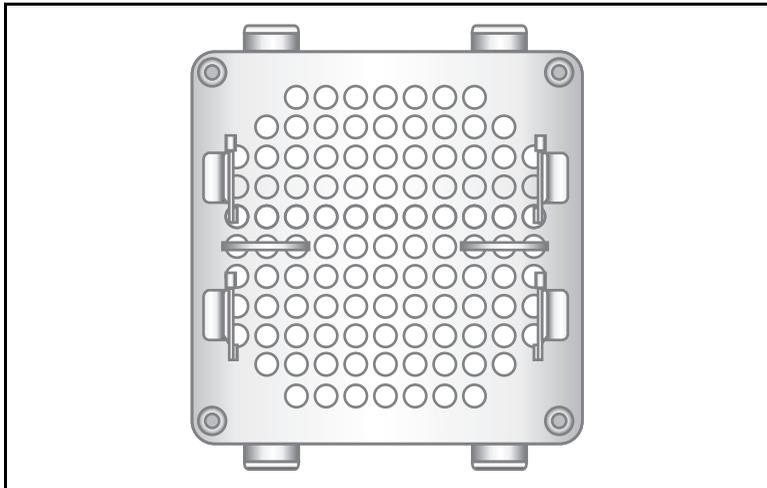


Figure 3 *Aligning the Microplate Platform*

4. Press the platform onto the shield plate.
5. Using the supplied nuts and washers, attach the Microplate Platform to the shielded plate. Tighten the nuts and washers with the included wrench.

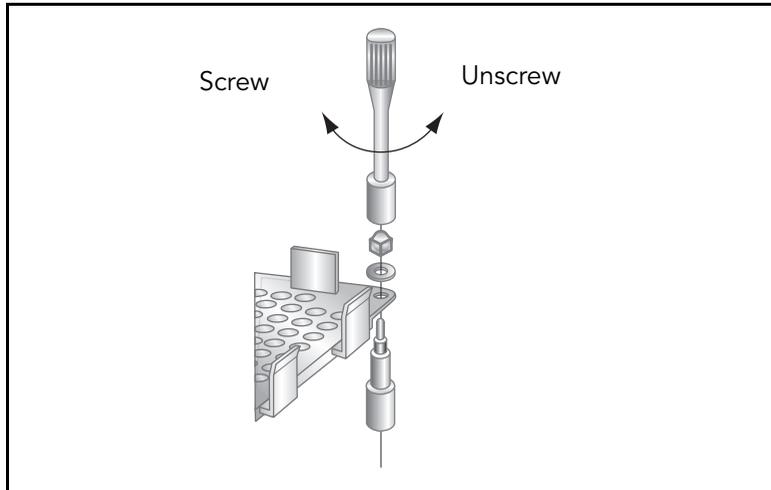


Figure 4 Attaching the Microplate Platform

6. Insert the microplates with your samples, and start the device.

Installation

There are several steps to installing the VeraCode Vortex Incubator.

Unpacking

Carefully examine the unit for possible shipping damage or missing parts prior to installation:

1. Open the box and remove the unit and all of the accessories.
2. Remove the packing material and inspect the machine to be sure that it has not been visibly damaged during shipping. Keep all packing material until you are sure that the machine functions properly.

3. Check the rear label for the following information:
 - a. Model Number
 - b. Serial Number
 - c. Electrical rating
 - d. Regulatory markings
4. Check the plug to be sure that it is compatible with your electrical outlet.

If any damage occurred during shipping, notify the carrier immediately. If any parts or accessories are missing, report them to your distributor immediately.

Selecting a Location

When selecting the location for your device, consider the following:

1. The unit needs to be placed on a smooth, level, and stable surface.
2. Leave at least 10 cm of space around the device for adequate air circulation.
3. Do not place the device in a location where there are rapid temperature and humidity changes. Also, avoid places where the unit would be exposed to direct sunlight or next to devices which output large amounts of heat.
4. Avoid places where the unit may be exposed to excessive shocks or vibrations.



Do not use the device in a flammable or explosive atmosphere.



The unit should not be placed so that it is difficult to pull out the plug from the back of the unit.

Environmental Requirements

The VeraCode Vortex Incubator has a wide temperature range at which it is operational; +5°C – 99.5°C. It is also safe for use in room that have up to 85% relative humidity.

Attaching the Power Cord

Attach the main power cord to the inlet on the back of the unit. Connect the other end of the cord to a grounded electrical outlet.

Starting Up

1. After installing the device, open the lid and attach the Microtube Platform or the Microplate Platform.
2. Close the lid.
3. Switch on the device using the Power switch on the front panel. The switch illuminates to indicate that power is on.
4. Check the running parameters and set new parameters, if necessary. Refer to *Basic Operation* on page 11.

Safety Recommendations



CAUTION

Use care when changing the microtube platform, especially if you have used the unit at temperatures higher than 60°C. Always wear protective clothing before you handle a hot microtube or microplate platform.

The unit will continue to shake for 5 seconds after the lid is opened. Be careful when opening the lid as the parts inside may still be in motion. In addition, never touch the fan unless the unit is turned off or unplugged.

Before cleaning the housing, unplug the unit. Clean the housing with a damp cloth and, if necessary, mild soap. Do not use abrasive or aerosol cleaners.

Do not use the unit near sources of water. Ensure that water does not spill in the device; be especially careful during cleaning procedures.

Ensure that all test tubes are closed tightly before placing them into the unit to avoid spilling samples inside the chamber.

In case of a malfunction, unplug the device and contact your distributor for service.



WARNING

Do not shake flammable or explosive samples.

Front Panel Overview

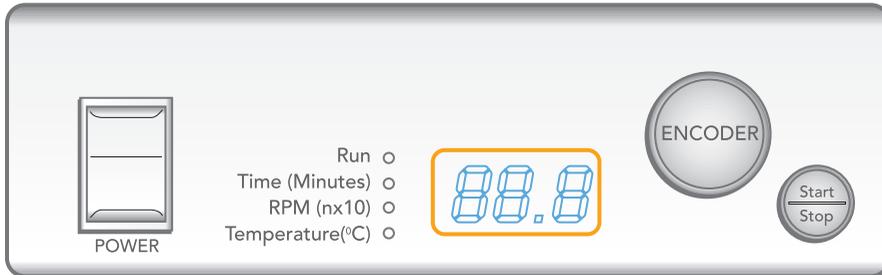


Figure 5 VeraCode Vortex Incubator Front Panel

Table 1 VeraCode Vortex Incubator LEDs

LED	Description
Run (green)	Illuminated when the unit is operating
Time (yellow)	Illuminated when the unit is set to adjust time
RPM (yellow)	Illuminated when the unit is set to adjust PRM
Temperature (yellow)	Illuminated when the unit is set to adjust temperature

Table 2 VeraCode Vortex Incubator Buttons

Button	Description
POWER	Switch on or off (illuminates when on)
ENCODER	By rotating the encoder right (+) or left (-) you can modify the time, temperature, or RPM settings of the unit. Pushing in on the ENCODER changes between time, temperature, and RPM set values. Rotating the ENCODER knob quickly increases the value increments, enabling values to be set more quickly.
Start/Stop	Start or stop shaking

Basic Operation

Press the POWER button on the front panel. The LED displays the line frequency F50 (50Hz) or F60 (60Hz). After a 2 second delay the unit defaults to the time setting.

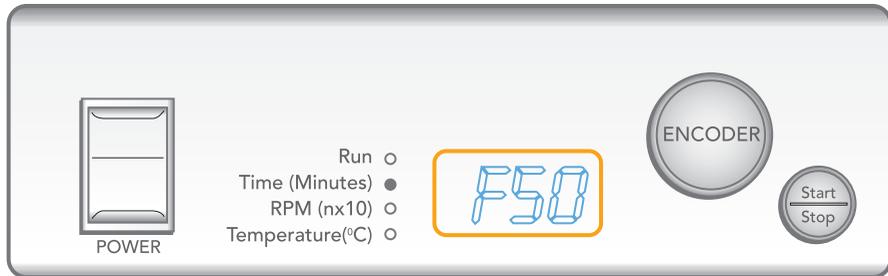


Figure 6 Powering On the VeraCode Vortex Incubator

Setting the Time

When the time LED is illuminated, rotate the ENCODER knob right (+) or left (-) to set the desired time value, from 30 seconds to 99 minutes, 50 seconds:

- ▶ 99.5 \Rightarrow 99 minutes 50 seconds
- ▶ 9.59 \Rightarrow 9 minutes 59 seconds

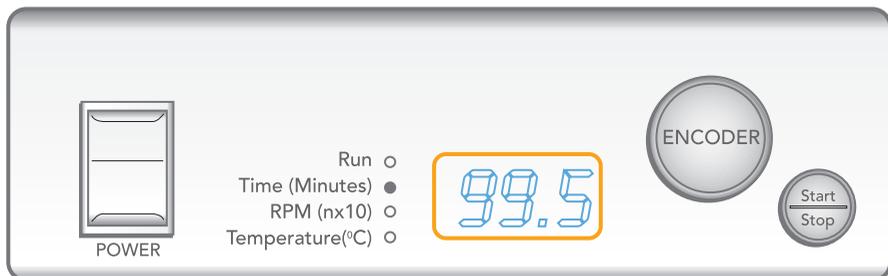


Figure 7 Time LED

To have the unit run continuously, set Time to hold by rotating the ENCODER knob to under 0.30 or over 99.5. The timer is set to "hold" when "HLd" appears.

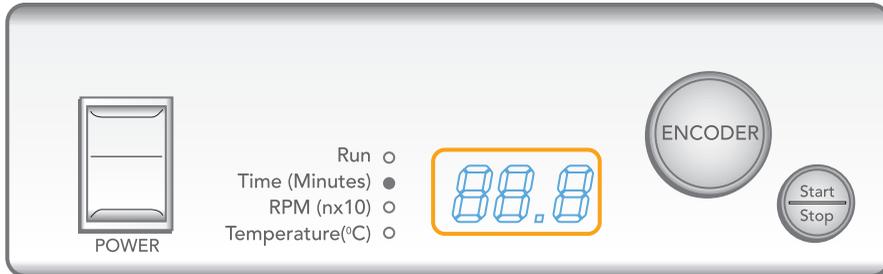


Figure 8 Running Continuously

Setting the RPM

When the RPM LED is illuminated, rotate the ENCODER knob right (+) or left (-) to set the rotating speed to the desired value:

- ▶ 34 ⇒ 340 RPM
- ▶ 120 ⇒ 1200 RPM

Turning the RPM setting below 20 turns the shaking function off. When the shaker is off, "OFF" appears.

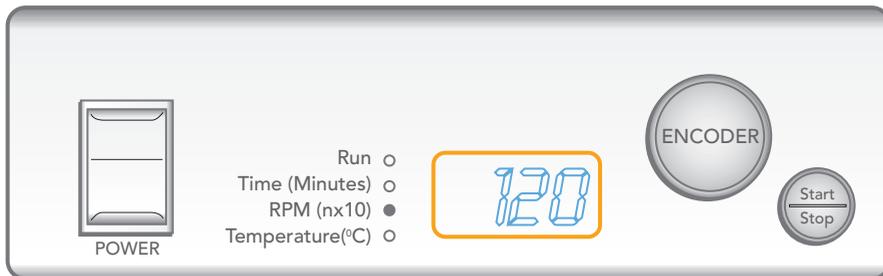


Figure 9 Setting the Rotating Speed

Setting the Temperature

Push the ENCODER knob to adjust the Temperature setting. When the Temperature LED is illuminated, rotate the ENCODER knob right (+) or left (-) to set the temperature to the desired value:

▶ 37.5 ⇒ 37.5°C

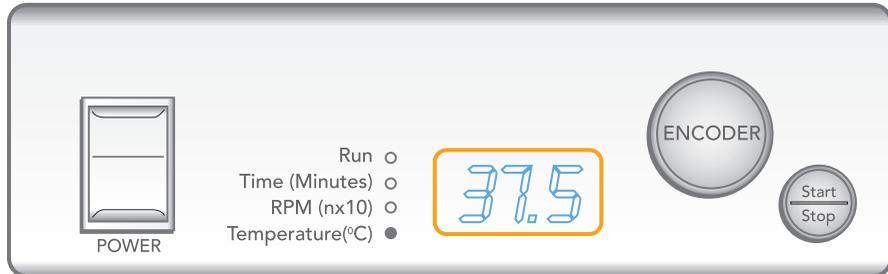


Figure 10 Adjusting Temperature

To use the shaker without using the temperature control, turn the ENCODER knob under 0.5 or above 99.5 until the display reads "OFF."

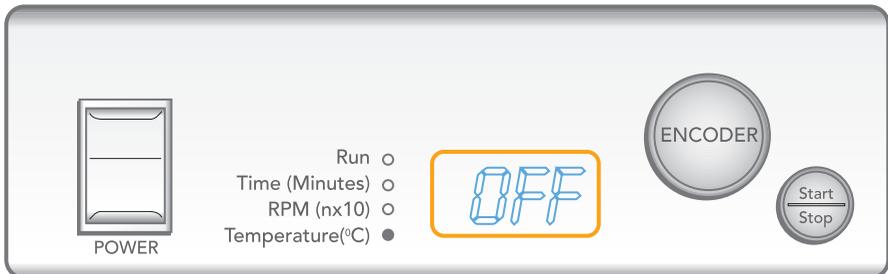


Figure 11 Shaking without Temperature Control

Starting the VeraCode Vortex Incubator

1. Press the Start/Stop button. Run and Time are illuminated. The timer counts down from the set time value.



You cannot adjust the set time during shaking.

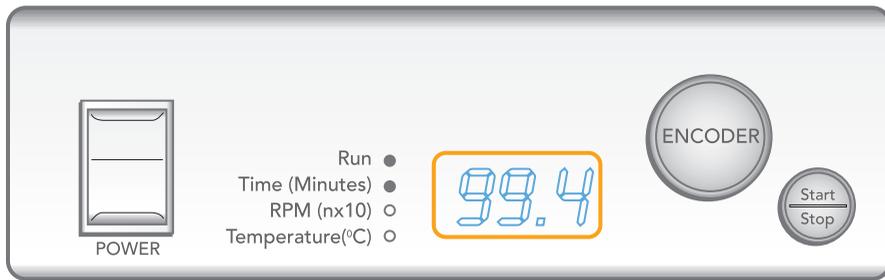


Figure 12 Timer Countdown

Changing RPM During a Run

1. Push the ENCODER knob until the RPM LED is illuminated.
2. Rotate the ENCODER knob right (+) or left (-) until the new value is set. While adjusting the RPM, the LED will pulse. When you stop rotating the ENCODER knob, the RPM LED will stop pulsing after 2 seconds.

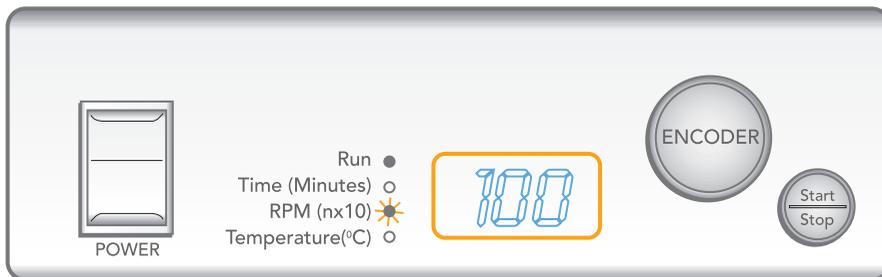


Figure 13 Changing the RPM During a Run

Changing the Temperature During a Run

1. Push the ENCODER knob until the Temperature LED is illuminated.
2. Rotate the ENCODER knob right (+) or left (-) until the desired temperature is set. While adjusting the temperature, the temperature LED pulses.

When you stop rotating the ENCODER knob, the temperature LED stops pulsing after 2 seconds.

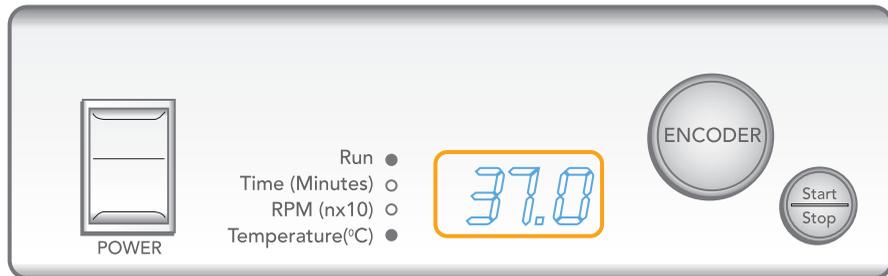


Figure 14 Changing the Temperature During a Run

Completing the Run

When the set time expires, or if you press the Start/Stop button, “End” appears on the display and the Run LED pulses. When the unit stops shaking, the last set values for Time, RPM, and Temperature are saved in memory.

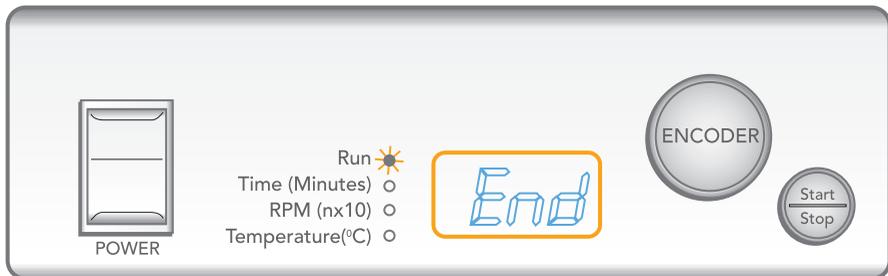


Figure 15 Run Complete

Shaking Without Heating

- ▶ To shake samples without heating, set Temperature to OFF.

Heating Without Shaking

- ▶ To heat samples without shaking, set RPM to OFF.



NOTE

The shaker motor drives the fan, which circulates warm air throughout the chamber aiding in temperature uniformity. If the unit is set to OFF, the temperature control will not be as precise due to lack of airflow over the heating element.

Viewing RPM Value

1. Turn the ENCODER one click right (+) or left (-). Note that the unit must be set for RPM mode. The RPM LED pulses for 2 seconds and the display shows the set RPM. After 2 seconds the display returns to showing the actual RPM and the LED stops pulsing.

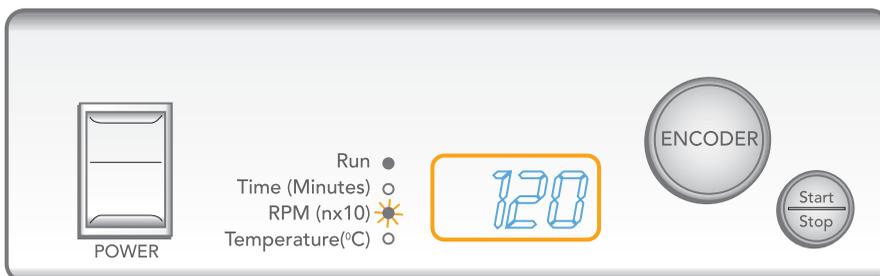


Figure 16 Viewing RPM Values During Shaking

Viewing Time Value

1. Turn the ENCODER knob one click right (+) or left (-). Note that the unit must be set for Time mode.

The Time LED pulses for 2 seconds and the display shows the set time. After 2 seconds the display returns to showing the actual time and the LED stops pulsing.

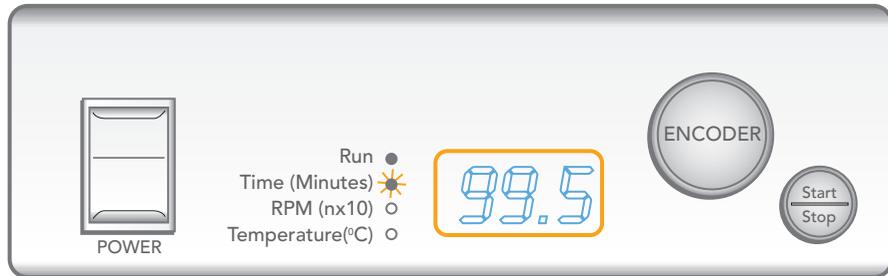


Figure 17 Viewing Time Settings During Shaking

Viewing Temperature Value

To view the set value for temperature during shaking:

1. Turn the ENCODER knob one click right (+) or left (-). Note that the unit must be set for Temperature mode (see *Setting the Temperature* on page 13).

On the display the Temperature LED pulses for 2 seconds and the display shows the set temperature. After 2 seconds the display returns to showing the actual temperature and the LED stops pulsing.

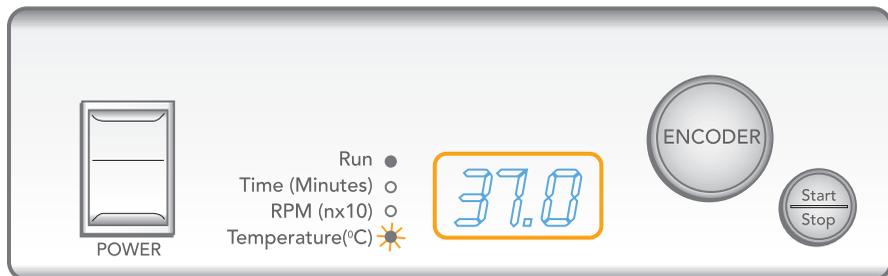


Figure 18 Viewing Temperature Settings During Shaking

Calibrating Temperature

The temperature control software allows you to calibrate the temperature settings.

1. Measure the temperature in the middle of the chamber after allowing the temperature to equilibrate for two hours. The temperature should be measured with a digital calibrated thermometer with precision 0.1°C or more.
2. After allowing the temperature to equilibrate 2 hours, read the temperature on the thermometer and compare it with the temperature on the LED display.

The difference between the thermometer and the display is the value which you will enter into the unit to recalibrate it.

Example 1

The temperature on the thermometer is 37.9°C, while the temperature on the display is 37°C. The difference between the two is $37.9 - 37 = 0.9$. This value (0.9) is the value you enter into the software.

Example 2

The temperature on the thermometer is 36.2°C, while the temperature on the display is 37°C. The difference between the two is $37 - 36.2 = 0.8$. This value (0.8) is the value you enter into the software.

Procedure for Calibrating Temperature



NOTE

Remember, temperature calibration should only be performed by qualified personnel.

1. Hold the ENCODER knob for 5 seconds. The display shows "Cor" (correction).
2. Press the ENCODER knob once, then enter the value from the previous section by rotating the ENCODER left or right to select a value (see Example 1 and Example 2 in *Calibrating Temperature* on page 18). Be sure to note whether your value was positive or negative.
3. After you have entered the value, press the ENCODER knob again.
4. Press Start/Stop to complete the temperature calibration.



Chapter 2

Service Information

Topics

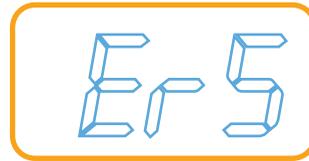
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Troubleshooting

Errors The VeraCode Vortex Incubator features built in self-diagnostic procedures that are constantly checking the operating parameters and performance.

If an error occurs, the error code appears on the front panel.

- Run ●
- Time (Minutes) ○
- RPM (nx10) ○
- Temperature(°C) ○



Error Descriptions

Table 1 Error Descriptions

Error	Description
E 1.1	Something is wrong with motor regulation (PWM regulator, pulse generator, motor). The unit will automatically stop. Call for service.
E 1.2	The motor did not reach the set RPM in 30 seconds. The unit will automatically stop. Call for service.
E 1.3	The unit has oscillated more then 100 RPM in 2 seconds. The unit will automatically stop. Call for service.
E 2.1	The temperature sensor is not working properly. The unit will automatically stop. Call for service.
E 2.2	The temperature sensor registers a 5°C higher temperature than the set temperature. The unit will automatically stop. Call for service.
Er 5	The lid of the shaker has been open for more than 5 seconds. The unit will automatically stop. To restart the shaker, close the lid and press the Start/Stop button.

Service and Support

Where to Find Help

Labnet International provides warranty and after-warranty support for all products. Depending upon how you purchased your equipment, the best source of support is either Labnet, your dealer, or your own organization. Labnet's warranty statement is included in this chapter and on the warranty card included with your unit. Please read over this information carefully and retain it for your records.

Warranty

One-Year Limited Warranty

Labnet International warrants this product against defects in materials and workmanship for a period of one year from receipt by the end user. During the warranty period, Labnet will, at its option, either repair or replace products that prove to be defective.

Should manufacturer be unable to repair or replace the product within a reasonable amount of time, a refund of the purchase may be given upon return of the product.

Exclusions

The warranty on manufacturer products shall not apply to defects or damage resulting from:

- ▶ Improper or inadequate maintenance by customer
- ▶ Unauthorized modification or misuse
- ▶ Operation outside of the environmental specifications for the product
- ▶ Improper site preparation and maintenance

Warranty Limitations

The warranty set forth above is exclusive and no other warranty, whether written or oral, is expressed or implied. Labnet specifically disclaims the implied warranties of merchantability and fitness for a particular purpose.

Service During Warranty Period

If your hardware should fail during the warranty period, contact an authorized manufacturer dealer or distributor in your country or contact Labnet directly at 732-417-0700 during the hours of 8:30 AM and 5 PM EST.

When shipping your equipment to Labnet for service, follow the packing guidelines listed below.

Shipping damage as result of inadequate packaging is the customer's responsibility. Use original packing materials whenever possible.

Repackaging Guidelines for Returning Your Equipment

- ▶ Clean the inside of the chamber and platforms according to Good Laboratory Practices standards, especially if you have used the equipment with hazardous biological or radioactive materials.
- ▶ Send a written description of the error with the unit.
- ▶ Use the original shipping container and packaging materials, if possible.

Technical Specifications

Table 2 Technical Data

Item	Specifications
Power	515W
Heater power	500W
Motor power	15W
Fuse	2 x 3 15A 250V
Ambient temperature	4°C–65°C
Relative humidity	Up to 85%, non-condensing
RPM regulation	Digital, load independent, from 100 to 1200 RPM in 10 RPM steps 1400 RPM only at 60 Hz
Shaker orbit	3 mm
Temperature operating range	4°C above room temperature to 99.5°C
Temperature sensor	PT100
Heating-up time	Approximately 5°C/minute
Temperature uniformity	± 0.5°C
Timer	30 seconds–99 minutes 50 seconds in 10 second steps under 10 minutes in 1 second steps timer HOLD function
Maximum capacity	56 test tubes; 1.5, 0.7, 0.5, 0.25 ml
Dimensions (w x d x h)	265 mm x 325 mm x 225 mm
Weight	11 kg



There are no end-user serviceable parts. Any service to the unit must be performed by a trained service technician.

Maintenance and Cleaning Instructions

The chamber should be cleaned regularly. Any samples which spill inside or outside the chamber must be wiped up immediately. Use only warm water or a mild soap solution to clean the surfaces of the unit. Using aggressive or abrasive cleaners can cause permanent damage to the finish.

To decontaminate the surface of the unit, use only neutral solutions (Ph 7–8). The stainless steel platform and nuts can be decontaminated in an autoclave (120°C).



Take care when cleaning the device after operation, especially if you have used the device at temperatures higher than 60°C. Exposed surfaces will be extremely hot and may cause burns to unprotected skin. Always unplug the unit before cleaning it.

Before using any cleaning or decontamination methods other than those recommended by the manufacturer, contact Labnet to ensure that the proposed method will not damage the equipment.