

OPERATING MANUAL

**EchoTherm™
REMOTE CONTROLLED HEATING DRY BATH
MODEL RHB20**

**DOCUMENT NUMBER RHB20-1
June 6, 2013**

**TORREY PINES SCIENTIFIC, INC.
2713 Loker Ave. West
Carlsbad, CA 92010**

**TELEPHONE: (760)930-9400
TOLL FREE: (866)573-9104
FAX: (760)930-9480
E-Mail: info@torreypinesscientific.com
Web site: www.torreypinesscientific.com**

TABLE OF CONTENTS

	<u>PAGE</u>
I. INTRODUCTION	3
II. WARRANTY	3
III. RETURN OF ITEMS	3
IV. LABELS	3
V. CAUTIONS	4
VI. GENERAL DESCRIPTION	4, 5
VII. POWER AND RS232 CONNECTORS	5
VIII. SET UP INSTRUCTIONS	6
IX. TEMPERATURE CALIBRATION	7
X. CLEANING, MAINTENANCE, AND CONSUMABLE PARTS	7, 8
XI. ADDITIONAL SYMBOLS	8

The Comprehensive Programming Guide is at the End of the Manual

I. INTRODUCTION

Congratulations on your purchase of an *EchoTherm™* Remote Controlled Heating Dry Bath Model RHB20. Please read the instructions carefully to insure that you receive the maximum benefit from it. Also, be sure to register your purchase on-line on our web site and receive a Torrey Pines T-shirt.

II. WARRANTY

Torrey Pines Scientific warrants this product to be free from defects in material and workmanship for a period of one year from the date of purchase. If repair or adjustment is necessary and has not been the result of abuse or misuse within the one year period, please return---freight prepaid---and correction of the defect will be made without charge.

Out of warranty products will be repaired on a charge basis.

III. RETURN OF ITEMS

Authorization must be obtained from our Customer Service Department before returning items for any reason. When applying for authorization, please include data regarding the reason the items are to be returned. For your protection, items must be **carefully packaged** to prevent damage in shipment and **insured** against possible damage or loss. Torrey Pines Scientific will not be responsible for damage resulting from careless or insufficient packing. A 15% restocking charge can be made on all returns, authorized or not.

Note: Torrey Pines Scientific reserves the right to make improvements in design, construction, and appearance without notice.

IV. LABELS

There are various labels on the body of this unit. Listed below are the labels and their meanings.

This symbol means "ATTENTION. The INSTRUCTION MANUAL IS TO BE CONSULTED FOR FURTHER INFORMATION"

This symbol means "WARNING, HOT SURFACE"

V. CAUTIONS

CHILLER/HEATER PLATE/BLOCK SURFACE

These units are capable of chilling and heating the plate/block surface from room temperature to 120.0°C. The upper temperature of 120°C (248°F) is hot enough to burn the skin if touched. **Use extreme caution at all times.** Never leave your unit accessible to others when it is hot. Never touch the plate surface unless you are sure it is cold.

ELECTRICAL

The RHB20 heating modules run off 12 volts dc at 8.4 amp. These instruments are supplied with a universal power supply that can take inputs from 100 to 260 volts AC $\pm 10\%$. The units are supplied with an AC input cord for the power supply. Be certain to use a line cord with the same rating and of the same type as the one supplied by the manufacturer. Use the normal care and precaution one would use with any electrical appliance.

VI. GENERAL DESCRIPTION

The Torrey Pines Scientific Model RHB20 is a resistance heater driven dry baths. It comes with a universal power supply a heating module. These units have only one moving part, the DC fan that cools the unit. Everything else is solid state and should last years without problem. All functions of the unit are accessed via the RS232 I/O port. A Programming Manual is supplied with each unit and has all instructions necessary for running the unit. There is no display or keypad on the units.

HEATER PLATE

The heater surface is a very flat aluminum plate designed for good contact with any flat surfaced item placed on it. It is supplied with magnets that match magnets in the sample blocks that hold the blocks firmly in place for use with robotic systems. Units are available on special order with threaded holes in the plate that will match holes in the blocks for screwing down the sample blocks. The plate size is 2.875" (7.3 cm) x 4.375" (11.1 cm). It is designed to accommodate all the aluminum blocks supplied by Torrey Pines Scientific. The temperature of the plate is sensed by a platinum RTD mounted under the plate. The computer in the unit compares the plate temperature with the target temperature and instructs the heater module to heat the plate as required to reach and hold the target temperature.

TIMER

The RHB20 has a count down timer which reads in hours, minutes, and seconds to a maximum of 25 hours. The timer can be queried for status and be instructed to notify the user on the screen of the PC.

LED

There is a green LED on the side of the units which flashes when the unit is powered and continues to flash even when a target temperature has been set. The LED will stop flashing and be constantly illuminated when the target temperature is reached and is stable to within $\pm 0.2^{\circ}\text{C}$ for more than 60 seconds.

VII. POWER AND RS232 CONNECTORS



The power is supplied from the bench top power supply to the unit via the DC jack on the left. It is a simple straight-in plug. The RS232 I/O port is the D-subminiature connector on the right. The RS232 cable provided with the unit will match this connector and will then be attached to any serial port on a PC.

VIII. SET UP PARAMETERS

SET UP PARAMETERS

1. Ambient operating temperature range is from 5°C to 40°C.
2. Maximum altitude of operation should not exceed 2000 meters.
3. Maximum ambient operating relative humidity should not exceed 80% at 31°C decreasing linearly to 50% relative humidity at 40°C.

SET UP INSTRUCTIONS

1. Place the unit securely on the surface.
2. Plug the power supply into a properly grounded, 3-wire outlet of proper voltage.
3. Plug the power supply cable into the jack on the heating module.
4. Place the sample block on the plate surface.
5. Connect the RS232 cable to the serial port on the computer. The LED on the side of the unit will illuminate.

Note: There are four (4) mounting holes on the bottom of the unit for mounting it on a robot or other fixture. They are threaded for 6/32 screws. The hole pattern is 3.524" (89.51 mm) x 2.20" (55.9 mm). Note that when mounting the unit leave at least 0.5" (12.7mm) clearance between the bottom of the unit and the deck or bench so the fan on the bottom of the unit can draw air clearly. Additional mounting holes for Tecan robots also are on the bottom of the unit. These match the mounting brackets # RHB20-300 available from Torrey Pines Scientific, Inc.

ENVIRONMENTAL INFORMATION

1. This unit is for installation category II.
2. This unit is rated pollution degree 2.

Note: Do not use this equipment in any manner not specified by the manufacturer.

IX. TEMPERATURE CALIBRATION

The temperature calibration set into the units is stable and will hold without drifting. However, our standards for temperature measurement may not be the same as the user. Therefore, the RHB20 is designed to be calibrated in the field by the user. Calibration instructions are provided in Programming Manual included here.

Note: The calibration is two-point for optimum accuracy. Therefore, if calibration is changed, it is best to clear the old calibration in memory. The unit is calibrated at the factory at 5.0°C and 70.0°C.

To calibrate the units at a particular temperature, set the unit to go to that temperature. Give the unit time to equilibrate, usually 20 minutes. Now measure the plate temperature (or the block or the samples to be controlled) using an electronic thermometer with a good surface temperature probe (a good immersion probe if calibrating a solution in a sample container).

NOTE: A SURFACE TEMPERATURE MEASUREMENT IS A DIFFICULT MEASUREMENT TO MAKE ACCURATELY. It requires good equipment and a surface temperature probe designed for this. If help is needed, contact the factory.

X. CLEANING, MAINTENANCE, AND CONSUMABLE PARTS

CLEANING

These units are subject to splashes and spills during normal use. Be sure to wipe up all spills with a soft cloth or paper towel as they occur. If a cleaning solution is necessary, use a mild soap or detergent solution and a soft cloth.

Caution: Do not attempt to clean the plate or block surface when hot. Burns might occur.

MAINTENANCE

There is no ongoing maintenance program needed with these units other than the normal care and cleaning as instructed above and a simple inspection done whenever the unit is to be used. This simple inspection should include:

1. Checking that the AC cord and the DC cable to and from the power supply module are not frayed or burned.

2. Checking that the unit is not dirty to a point where proper performance is impaired.
This is important with dust buildup on the fan guard on the bottom of the unit.

Be certain to store the unit properly when not in use in an area that will not have items placed on top of the unit. Cover the unit in a way that will keep dirt and other foreign bodies out of the unit.

SPARE PARTS AND CONSUMABLES

There are very few spare or consumable parts. A simple list is below. For more information contact the factory.

<u>Part Number</u>	<u>Description</u>
730-0001	Power Cord, US
730-0006	Power Cord, German (European)
730-0008	Power Cord, UK
730-0004	Power Cord, Italian
730-0005	Power Cord, Australian

XI. ADDITIONAL SYMBOLS

The following are additional symbols found on labels on the instrument

<u>Symbol</u>	<u>Description</u>
V	Voltage
~	Alternating Current
A	Current
Hz	Frequency
W	Power

For complete operating instruction see the RHB Programming Manual included with the unit.